**Shaun Fix**

Emergency Medical Consultants

***The Premier Provider Of Quality Medical Training Programs***

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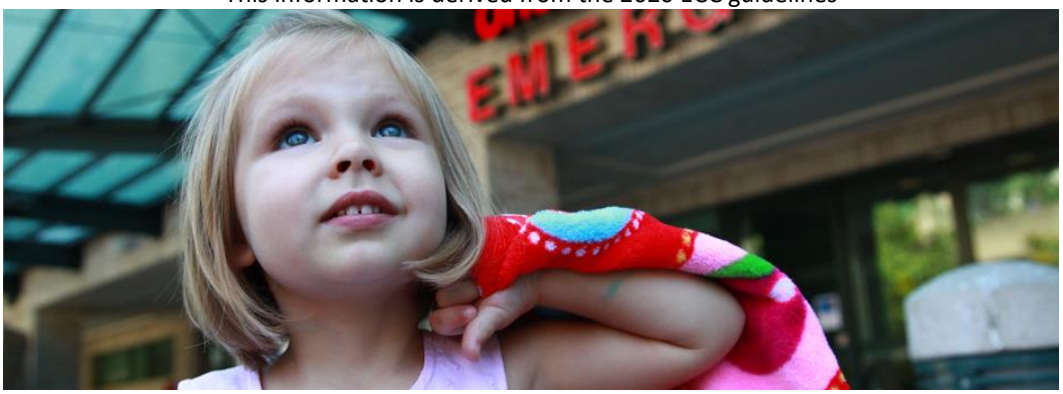
# PEDIATRIC ADVANCED LIFE SUPPORT

## Participant Preparation Packet 2021

This information is derived from the 2020 ECC guidelines



This packet contains prep information for the PALS Course as well as EKG and BLS reviews.
We strongly recommend completing these exams prior to the course.

**-MANDATORY REQUIREMENTS-**

**AHA requires participants to have the current textbook with them during class.**
**#1-Complete the Online Mandatory Self -Assessment exam. Min score 70%. Directions on pg 5 in the textbook -Must be completed to access pre-course videos.**
**#2-Complete mandatory 3 hour pre-course videos with quizzes. see pg. 5 of textbook.**
**#3-** Participants **must bring both certificates** of completion to class

**★ If you are attending the BLS section following, refer to page 42 for additional instructions.**
(There is mandatory pretest if you are choosing to do BLS)

**Course Date/Time: _____ Location: _____**

**Name: _____**





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***This copyrighted prep packet is a supplement for those students taking PALS with EMC.***

Welcome to the latest American Heart Association Pediatric Advanced Life Support course sponsored by Emergency Medical Consultants Inc. The Full training course is two days. The refresher course is one day only. NOT ALL 2 DAY COURSES HAVE A ONE DAY REFRESHER COMPONENT – PLEASE VERIFY WITH OUR OFFICE **IF** WE ARE OFFERING A ONE DAY COURSE AND **WHICH DAY** IT WILL BE.

The PALS course stresses early recognition and management of pre-terminal events rather than merely "running a pedi code". We use no stress, small group interactive skills and scenario stations to present the information in a fun, relaxed atmosphere. We are pleased you have chosen our program and are sure you will find the course informative and worthwhile.

In order to keep our programs "Stress Free" and assure all participants meet the AHA requirements for proficiency, a certain amount of home study is required prior to the actual class. The AHA mandates participants have access to the latest textbook, review it, and suggest completing the pretest prior to entering the program**.**

The evaluation process consists of a written exam, on which participants are required to score at least 84% and two patient management scenarios requiring appropriate treatment. Again, these stations are designed to be user friendly and low stress.

We work very hard to keep our programs upbeat, relevant and at a level ALL participants who have prepared will pass with ease. Our faculty is always available to explain information or procedures, just ask.

All information is based on the American Heart Association PALS standards at the time of printing and thought to be correct. Providers are encouraged to review the PALS textbook and their specific policies prior to implementing any procedures or administering any medication based on this study packet.

***This packet contains prep information and a pretest. The AHA text provides information to access their online pre-test information at www.heart.org/eccstudent. Page 6 of your text will give you a code/password.***

**For more EKG practice, log onto www.Skillstat.com**

If you have any questions or comments feel free to call our office at 772-878-3085.

We look forward to seeing you in the PALS program.

Shaun Fix
President, Emergency Medical Consultants Inc.

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# 2020 Outcome Driven Notes

**Rapid Response teams are essential to improve patient outcomes by identifying and treating early clinical deterioration.**

**CPR Coach-** helps the resuscitation team perform high quality CPR
Provides interactive feedback about the rate, depth, and recoil of compressions.
Monitors ventilatory performance & minimizes pauses in CPR. Optimizes CCF.

The following efforts increase the **chest compression fraction (CCF),** which ideally minimizes the hands off time during CPR.

- ✓ Pre-charge the defibrillator 15 sec before rhythm check/shock is due
- ✓ Compressor hovers over, but off, the chest during defibrillation
- ✓ Intubate without delay in compressions
- ✓ Try to keep other stops at 5 sec or less (10 is still acceptable)
- ✓ Administer meds during compressions

**BLS &PALS 2020 Updates: (*rationale in italics)***

1. Chain of Survival (6 links): Activate code team. Hi quality CPR, Defib, ALS Care, Post Resus Care, -Added addressing Recovery needs for team and family.
2. Infant/child with a pulse, but inadequate/absent respirations, give 1 breath every 2-3 sec. (20-30 per min.)
3. CPR with an advanced airway=1 breath every 2-3 seconds (20-30 breaths/min) *improves ROSC rates*
4. May use cuffed ETTs in infants/children. *May decrease risk of aspiration, tube changes and reintubation.*
5. No cricoid pressure during intubation. Just no.
6. Encourage early epinephrine=within 5 min from start of compressions. *Increases ROSC survival rates*
7. Arterial lines can be used to monitor diastolic blood pressure-aim for minimum 25mmHg in infants and a minimum of 30 mmHg in children. *Improves neurological outcomes*
8. Septic Shock- admin fluids in 10-20 mL/kg boluses. Crystalloid or colloid fluids with frequent reassessment *Fluid overload leads to ↑ intubations and deaths.*
9. Septic Shock- use either epinephrine or norepinephrine as the initial vasoactive infusion. If they are unavailable, dopamine may be considered. *Epi/Norepi may be superior to dopamine as initial vasopressor*
10. Septic Shock- if requiring vasoactive support, consider stress dose corticosteroids*. May be of value.*
11. Hemorrhagic Shock- give blood products ASAP, instead of crystalloids for ongoing volume resuscitation.
12. Opioid Overdose: (respiratory arrest) or only gasping=standard care PLUS IM or nasal naloxone. (cardiac arrest) =high quality CPR & standard resuscitative measures takes priority over naloxone.
13. Myocarditis or Cardiomyopathy Patients- Should be monitored in intensive care areas when indicated for ongoing therapy, as their risk of cardiac arrest is elevated. *Extracorporeal life support (ECLS) may be useful pre-arrest to provide end organ support and prevent cardiac arrest.*
    - ➢ In cardiac arrest-consider early extracorporeal life support (ECLS)
14. If available, continuous EEG monitoring is recommended to detect and treat seizures after cardiac arrest.
15. Critical neonatal perfusion @ NICU level. Transfer for appropriate care. May need to reduce respiratory rate (or use meds) to keep PaCO2 at 50-60 mmHg. Neonates with inadequate pulmonary blood flow may benefit from mild respiratory acidosis
16. SVT- (even if unstable) try adenosine, if access is available- before cardioversion.
17. VTach-expert consult before any meds. Stable: reg & monomorphic, try adenosine. Unstable: cardiovert.

# Pediatric Advanced Life Support
# Syllabus
# Approx 14 hours

### Two Day Full Training Program

## Day One

Program Introduction
Pediatric Assessment
Recognition of Respiratory Failure & Shock
**Break**
Overview of Rhythms / Algorithms
Skills Review – Respiratory Management, Vascular Access, Review CPR standards
**Lunch**
Skills stations

1. Respiratory Emergencies, Airway management
2. Shock, Vascular Access IV & IO Skills, medication & delivery method review
3. High Performance Team- Child/Infant CPR & Defibrillation

## Day Two

High Performance Resuscitation/ Team Concept
Group Review of Patient Cases
**Break**
Patient Case management Scenarios / Simulations

1. Shock and Trauma – Includes Tachycardia
2. Respiratory Emergencies – Includes Bradycardia
3. Cardiac Cases – High Performance Team Megacode & Post Arrest Care

**Lunch**
Evaluations

1. Written Exam
2. Scenario Management Evaluations

# Pediatric Advanced Life Support
# Syllabus

## One Day- Refresher Program
## Approx 7 hours

## GENERALLY PRESENTED THE FIRST DAY OF 2 DAY PROGRAM

Program Introduction
Pediatric Assessment, Recognition of Respiratory Failure and Shock

**Break**
High Performance Resuscitation Team
Overview of Rhythms / Algorithms
Skills Review, Respiratory Management, Vascular Access, Review CPR Standards

**Lunch**
Group Review of Case Management
1. Cardiac Cases – High Performance Team Megacode & Post Arrest Care
2. Respiratory Cases – Includes Bradycardia
3. Shock Cases - Includes Tachycardias

BLS Child & Infant Skills Check-off

Evaluations
1. Written Exam
2. Scenario Management Evaluations

# ASSESSING KIDS

## Think like the Child

"A giant stranger is coming after me"
"Mom says don't talk to strangers"
"If I say I'm OK they'll leave"

## Unique issues when dealing with children

They don't think we are heroes when we are there to treat them
Medically, they "hide" illness and injury by maintaining normal vital signs
Head injuries and liver bleeds are 2 culprits that can cause a slow deterioration

## Tips for dealing with children

Understand MOST of us don't get to regularly evaluate signs and symptoms in kids
Remember they may present a little differently
Assess the conscious child from across the room initially
If appropriate, use the parents for psychological first aid
Talk to the child about himself and his toys to gain a rapport
Unlike adults, stable kids will generally stay that way if we support their ABC's

*Continually review the unique presentation of respiratory and circulatory compromise in children since it differs from the adult patients we are used to dealing with

## Good resources for pediatric information

American Academy of Pediatrics 847-434-4000 www.aap.org
American College of Emergency Physicians 800-798-1822 www.ACEP.org
EMSC 202-844-4927 www.ems-c.org
National Safe Kids Campaign 202-662-0600 www.safekids.org
National Center for Injury Prevention and Control 770-488-1506 www.ohcinfo@cdc.gov

| Heart Rate | | Resp Rate | | Lowest acceptable (systolic)BP | |
|---|---|---|---|---|---|
| Infant (<1 yr) | 100-180 | Infant (<1 yr) | 30-53 | Infant (1mo-1yr) | 70-104 |
| Toddler (1-3 yrs) | 98-140 | Toddler (1-3 yrs) | 22-37 | Toddler (1-3 yrs) | 86-106 |
| Preschool (3-5 yrs) | 80-120 | Preschool (3-5 yrs) | 20-28 | Preschool (3-5 yrs) | 89-112 |
| School Ages (5-12 yrs) | 75-118 | School Ages (5-12 yrs) | 18-25 | School Age (5-12) | 97-115 |
| Adolescent (>12 yrs) | 60-100 | Adolescent (>12 yrs) | 12-20 | Adolescent (>12 yrs) | 110-131 |

**Heart rate and resp rate may be lower while asleep*

# TEAM CONCEPT

- Realize that resuscitation involves professionals of various levels throughout the code then following through to post resuscitation management.
- Team leader needs to clearly define each person's role. If you are assigned a role that you are not skilled to do immediately notify the team leader and offer to function in another capacity.
- Each team member performs a specific task: ventilations, compressions, medications, vascular access, defibrillation, and documentation / timing. The team must work together under the guidance of a Team Leader to coordinate the combined resuscitation attempt.

- The team must work together and understand what "the next step" is going to be in order to be prepared to carry out skills quickly and efficiently during "pause for evaluation" phase every 2 minutes.
- There should be a closed-loop communication from the team leader to the team and back.

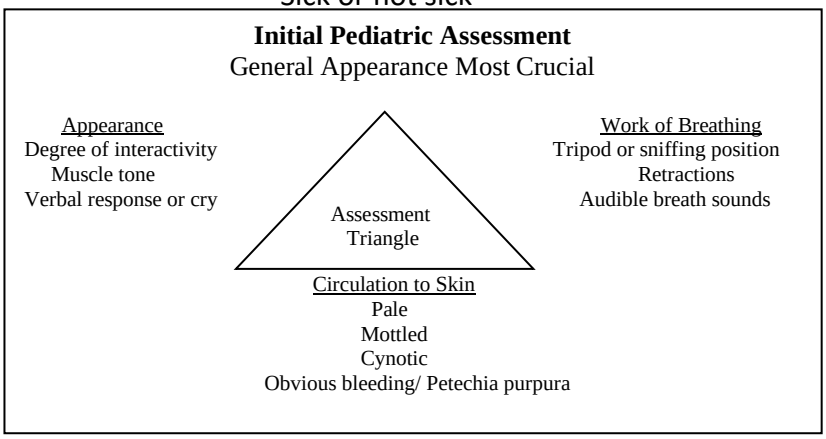
- Example: as the team leader requests the next procedure the team member should repeat back what they understood the direction to be. This makes for a clearer understanding and reduces mistakes. Keep in mind the team leader could make a mistake in an order and constructive intervention from other team members may be appropriate to maintain consistency within the ACLS Guidelines.

# PEDIATRIC ASSESSMENT SEQUENCE

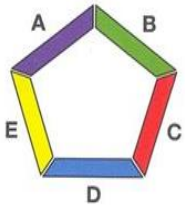
## *INITIAL IMPRESSION

"Sick or not sick"

**Initial Pediatric Assessment**
General Appearance Most Crucial




## *EVALUATE




### Primary Assessment

| **A**irway | **B**reathing | **C**irculation | **D**isability | **E**xposure |
|---|---|---|---|---|
| Patent? | Present? | Present? | Level of | expose body |
| Noiseless? | Rate | extremities | consciousness | and |
| | Effort | cap refill | | exposure control |
| | Sounds | | | |

### Secondary Assessment

| Physical Exam | SAMPLE History | Bedside Tests |
|---|---|---|
| Head | *Symptoms *Past history | *Vital signs |
| to toe | *Allergies *Last intake | *Glucose |
| as needed | *Meds *Events causing incident | *Monitors ($O_2$,EKG) |

## *IDENTIFY

| Respiratory Problem | Circulatory Problem (Shock) | Cardiac Problem (Tachy, Brady or CP Failure) |
|---|---|---|

## *INTERVENE

Manage

C – support Circulation = from EKG to vascular access, fluids or meds as needed
A – position Airway if needed
B – manage Breathing = blow by $O_2$ to BVM, intubation or meds as needed

* Labs * Cultures * X-rays * Medications * Cardiac Tx * Specialty Consult

# RESPIRATORY DISTRESS / RESPIRATORY FAILURE

The key to pediatric resuscitation is to recognize early and treat aggressively before the child decompensates.

**Respiratory distress**

**Potential respiratory failure:** Increased work of breathing

- Tachypnea
- Tachycardia
- Anxiety /Agitation / Irritability
- Retractions
- Nasal flaring

**Probable respiratory failure:**

- Lethargy
- Head bobbing
- Grunting
- Cyanosis / Pallor

**Respiratory failure:** Inadequate ventilation or oxygenation

- Slow respirations
- ↓ $SaO_2$

**Cardiopulmonary failure:**

- Agonal breathing- inadequate respiratory effort
- Bradycardia

Respiratory Management

**Maintain airway**

- Usually done by patient if awake
- For decreased level of consciousness place in "sniffing position"
  (supine with neck and head slightly elevated)

**Assist with oxygen – only enough to maintain saturation between 94-99%**

- Blow-by, if alert and apprehensive
- Direct mask if the child will accept and needs it
- Bag valve mask for low rate or tidal volume
- Intubation - see indications below

**Consider intubation by a skilled professional for the following:**

- Unconscious in profound shock
- Any patient requiring bag valve mask ventilations for more than one minute
  - respiratory arrest
  - respiratory depression not responding to bag-valve-mask ventilations
  - bradycardia not responding to bag valve mask ventilations
  - tachypnea with poor tidal volume not responding to bag-valve-mask

If an intubated patient suddenly deteriorates think **"DOPE"**

- **D**isplaced tube
- **O**bstructed tube
- **P**neumothorax
- **E**quipment failure (i.e. ventilator failure, ambu failure, $O_2$ empty, etc.)
  (not necessarily in that order)

**Four types of Respiratory Problems**

**Upper airway obstruction**
Stridor
Voice change/drooling
↑ inspiratory effort with retractions

**Lower airway obstruction**
Asthma, bronchiolitis
↑ expiratory effort
Prolonged expiratory phase
Cough
Wheezing
Possible ↓ air movement

**Lung tissue disease**
Pneumonia
Pulmonary edema
Grunting
Crackles (rales)
Decreased air movement
Hypoxia

**Disordered control of breathing**
Irregular rate & pattern
Variable effort/ Inadequate effort
Central apnea
May occur post seizure

**Endotracheal Tube (ETT)**
Cuffed is preferred, as it can improve capnography and ventilation by decreasing the need for reintubation and potential aspiration.
Choose cuff size and monitor cuff pressure carefully.

# SHOCK

Shock: inadequate perfusion to meet the metabolic demands of the tissues.

*Question #1: Is there a reason for this child to be in shock?*

**Early signs**

- Tachycardia
- Decreased perfusion of skin – cool, pale or mottled, delayed capillary refill
- Altered mentation
- Discrepancy in volume between peripheral and central pulses

Septic shock may have brisk capillary refill with bounding central pulses

Hypotension is a late sign of shock

**Compensated shock** – patient showing signs of shock with a normal B/P

**Hypotensive shock** – shock with hypotension (generally not seen until 30% fluid loss)

**General Treatment Guidelines:** (specific treatments, per etiology, are found on pg. 27)

- Assess responsiveness frequently
- Maintain Airway
- Improve $O_2$ delivery
- Maintain Body Temperature
- Monitor EKG and Pulse oximetry
- Obtain vascular access (IV or IO)
- Support organ function
- Administer Fluid Bolus's per shock etiology
- Administer blood products, if indicated
- Consider vasopressors for refractory, cardiac, or septic shock
- Reduce oxygen demand
    - support breathing
    - control pain and anxiety
    - manage fever
- Prevent progression to cardiac arrest

**Hypovolemic Shock:**
The most common type of shock in children secondary to reduced intravascular volume.
**Causes:**
Diarrhea
Vomiting
Hemorrhage
Burns
Dehydration

If IV access is not readily accessible in a patient in arrest, near arrest or profound shock, proceed with intraosseous infusion. Simple and effective route to establish vascular access.

**Contraindications for IO access:**
--Fractures or crush injuries near the access site
--Fragile bone conditions (eg, osteogenesis imperfecta)
--Previous IO attempts in the same bone
--Avoid if infection present in the tissue overlying bone

***Any meds given by IV can be given IO

**IV tips:**

- Don't tie the tourniquet too tight
- Use transilluminator if available
- Immobilize the child if necessary flush the angiocath with heparin flush solution or saline
- Leave the plug off the end of the angiocath
- Bevel down for small or superficial veins
- Use skin prep (i.e. benzoin) and lots of tape
- Secure to IV board if necessary

In the trauma patient with shock give two fluid boluses; if symptoms are still present consider packed cells or blood.


## The latest guidelines recommend $CO_2$ Waveform Capnography

- Remember normal $CO_2$ is 35-45
- $CO_2$ is acid
- High $CO_2$ - denotes respiratory acidosis

- Ventilate more effectively and more frequently
    - Low $CO_2$ - during cardiac arrest indicates low perfusion
    - May be common during arrest due to CPR being the only perfusion
    - (compressions are only about 20% as effective as normal blood flow)
    - Goal is to maintain $CO_2$ above 10 mmHg

If $CO_2$ remains below 10mmhg throughout code, survival is virtually "0"

- $CO_2$ waveforms provide a more sensitive and rapid evaluation of respiratory function than pulse oximetry
- Specifically evaluating PERFUSION

Use End tidal CO2 (after intubation) to evaluate:

- ET tube placement (Is there any $CO_2$ ?)
- Effectiveness of Compressions, is the $CO_2$ level above 20mmhg?
  - if not, evaluate compressions

# CARDIOPULMONARY FAILURE

Bradycardia (below 60/min) with Agonal Breathing

**Assess CAB's**
Ventilate
Administer 100% Oxygen
Intubate when appropriate
Assess Vital Signs
Obtain vascular access

↓

Cardiorespiratory Compromise?
Poor perfusion
Hypotension
Respiratory distress

↓

**No**
Observe
Support CAB's
Transport → peds facility

**Yes**
Perform chest compressions if despite oxygenation & ventilation:
Heart rate <60/min

Continue CPR until rate sustains at greater than 60 min, ideally over 80 -100

↓

Epinephrine
IV/IO: 0.01 mg/kg 1:10,000
Administer within 5 min of start of compressions

↓

Repeat Epinephrine every 3 -5 minutes at same dose

↓

Atropine
0.02 mg/kg (usually not used in children < 1 year)
Min. dose: 0.1 mg
Max single dose: 0.5 mg for child
1.0 mg for adolescent
May be repeated once

↓

Consider transthoracic/transvenous pacing

↓

Consider treatable causes
Hypoxia } the 2 most reversible causes
Increased vagal tone
Hypoglycemia
Hypothermia
Herniation of brain stem

In general, children require defibrillation much less frequently than adults, however more recent studies confirm ventricular fibrillation is more prevalent than previously thought and may be missed due to the fact that EKG's may not be initiated as rapidly as in adults.

**DEFIBRILLATOR – REQUIRED KNOWLEDGE**
**JOULE (WATT SECONDS) SETTINGS:**

DEFIBRILLATION: 2 J/kg First attempt, 4 J/kg later attempts
(higher doses may be considered up to 10 J/kg)
CARDIOVERSION: 0.5-1.0 J/kg. May increase to 2 J/kg

1. Knows how to turn monitor AND defibrillator on
2. Knows how to set current (joules)
3. Knows how to set sync button for perfusing rhythms
4. Knows how to discharge paddles to patient
5. Knows how to QUICK LOOK / Paddle function vs. lead select
6. Knows where to position paddles/ pads
7. Knows how to change to pediatric paddle size
8. Knows indications for use:
   Ventricular fibrillation
   Ventricular Tachycardia
   Supraventricular tachycardia
9. Knows to clear the patient area
10. Knows what interface media to use – gel or pads
11. Knows current to use in children and infants


Automated External Defibrillator
Shocks at preset energy levels


Physio Control Lifepak Model: Manual Defibrillator
Operator chooses energy level

*AED – (Automatic defibrillator) can be used on all children and infants. Ideally, use pediatric pads because they reduce the energy as it comes from the defibrillator. If pediatric pads are not available, adult pads may be used, as the risk of allowing ventricular fibrillation to deteriorate into asystole is greater than the risk posed by the higher energy of the AED using adult defibrillation doses.*

# Skills Review for Healthcare Providers
# The CAB's of CPR

**Simultaneously Determine unresponsiveness and check for <u>effective</u> breathing**
If unresponsive: call a "code" or 911

**C = Circulation-** Check for a pulse Max - 10 seconds. If pulse is not <u>definite</u>, begin compressions.
**A = Airway-** Open airway (head tilt/chin lift)
**B = Breaths-** Give 2 breaths then back to compressions
D = Defibrillator- Attach a manual defibrillator or AED

**CPR Reference**

| | Adults (> puberty) | Children (1 - puberty) | Infants (< 1yr) |
|---|---|---|---|
| **Rescue breathing, Victim definitely has a pulse** | 10 breaths/min<br>recheck pulse every 2 minutes | 20-30 breaths/min<br>recheck pulse every 2 minutes | 20-30 breaths/min<br>recheck pulse every 2 minutes |
| **Compression landmark**<br>**No pulse**<br>(or pulse <60 in infant or child with poor perfusion) | Middle of the chest,<br>between the nipples | Middle of the chest,<br>between the nipples | 1 finger below nipple line |
| **Compressions are performed with** | Heel of 2 hands | Heel of 1 or 2 hands | 2 fingers OR<br>2 thumbs when using encircling hands technique |
| **Rate of compressions per minute** | 100-120/min | 100-120/min | 100-120/min |
| **Compression depth**<br>(Allow full recoil) | At least 2 inches<br>↑ 2 inches | At least 1/3 depth of chest<br>2 inches | At least 1/3 depth of chest<br>1 ½ inches |
| **Ratio of compressions to breaths**<br>**Once an advanced airway is placed ventilations will be 1 every 6 sec. with continual compressions.* | 30:2<br>Change compressors and reevaluate every 2 min | 30:2<br>15:2 if 2 rescuer<br>Change compressors and reevaluate every 2 min | 30:2<br>15:2 if 2 rescuer<br>Change compressors and reevaluate every 2 min |

## Foreign Body Airway Obstruction

** If not rapidly removed call Emergency Medical Service **

**Conscious choking**

| Adult | Child | Infant |
|---|---|---|
| Abdominal Thrusts<br>*(Red Cross Class – 5 Back Blows)* | Abdominal Thrusts<br>*(Red Cross Class – 5 Back Blows)* | 5 Back Blows/5 Chest Thrusts |

*Unconscious choking*

| Adult | Child | Infant |
|---|---|---|
| Call a "code"<br>or call 911<br>Begin CAB's of CPR<br>Before giving breaths:<br>look in mouth for foreign body,<br>remove object if it is seen.<br><br>Repeat cycles of CPR if needed | Begin CPR<br>If second rescuer is present,<br>send them to call a "code" or 911,<br>otherwise, call after 2 min of CPR<br>Before giving breaths:<br>look in mouth for foreign body,<br>remove object if it is seen.<br><br>Repeat cycles of CPR if needed | Begin CPR<br>If second rescuer is present,<br>send them to call a "code" or 911,<br>otherwise, call after 2 min of CPR<br>Before giving breaths:<br>look in mouth for foreign body,<br>remove object if it is seen.<br><br>Repeat cycles of CPR if needed |

# Cardiac Rhythm Disturbances

Most children do not have significant cardiac dysrhythmias causing instability (do not take this to mean that children never have cardiac dysrhythmias). In general rhythm disturbances in children are treated emergently when the patient is symptomatic or if the rhythm is likely to deteriorate.

In children, rhythms are classified as:

**Tachy (Fast):**

First sign of stress
Look for causes other than cardiac (i.e. fever, pain, hypovolemia)
Not considered SVT unless 220 in infant, 180 in child.
Signs of SVT – no p wave, HR does not vary with activity, abrupt onset, narrow complex
Wide complex (>.09 sec or 2 boxes) may be v-tach

**Brady (Slow) Causes:**

Hypoxia
Hypothermia
Hypoglycemia

**Collapse (Absent):**

Frequently the end result of prolonged hypoxia and/or acidosis
May be Agonal/Asystole, pulseless electrical activity (PEA) or v-fib/pulseless v-tach

## Newborn Resuscitation

**Quick History:** Multiple birth? Prematurity? Meconium? Narcotic Use?
**Quick Assessment:** Term of gestation? Amniotic fluid clear? Breathing or crying? Good muscle tone?

### Term Newborn Vital Signs

Heart rate (awake): 100 to 180 bpm
Respiratory rate: 30 to 60 breaths/min
Systolic blood pressure: 55 to 90 mm Hg
Diastolic blood pressure: 25 to 55 mm Hg

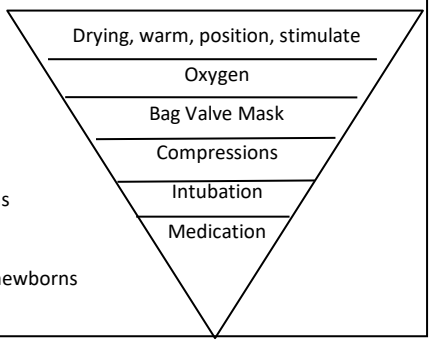
**APGAR SCORE**

| Sign | 0 | 1 | 2 |
|---|---|---|---|
| Heart rate (bpm) | Absent | Slow (<100 beats/min | ≥100 beats/min |
| Respirations | Absent | Slow, irregular | Good, crying |
| Muscle tone | Limp | Some flexion | Active motion |
| Reflex irritability (to a catheter in the nares, tactile stimulation) | No response | Grimace | Cough, sneeze, cry |
| Color | Blue or pale | Pink body with Blue extremities | Completely pink |

7 – 10 Normal
4 – 6 Moderately depressed requires $O_2$ and stimulation
0 – 3 Severely depressed requires resuscitation

**Initial Assessment and Stabilization Outside the Delivery Room**

Assess and support*:
**A**irway (position and clear)
**B**reathing (stimulate to breathe)
**C**irculation (assess heart rate and color)
Temperature (warm and dry)




* Note ABC is still used in newborns

## Meconium

- Suction Mouth and nose, *only if obstructed*
- Intubate and suction using meconium aspirator, *only in depressed neonates with thick meconium present.*
- Repeat with new ETT until clear
- Then start pyramid

# Initial Management of the Pediatric Arrest
# "The Panic Zone"
**Shaun Fix**

## I. Introduction

Perhaps the greatest stressor for the medical provider is dealing with and managing the uncommon cardiac arrest in the pediatric population. While adult "codes" are routine, "pedi codes" become hectic, frantic, ad chaotic- thus, the "load and go" response takes over. This session is designed to give participants a brief overview of the pediatric arrest pathophysiology, expected outcomes and a simple format to effectively apply BLS and ALS procedures in order to give your patient their best chance for survival.

## II. Learning objectives

At the end of this program the participant will be able to:

1. Discuss the pathophysiology of the pediatric arrest in contrast to the adult.
2. Discuss expected outcomes for the pediatric patient who arrests
3. Explain the use of oxygen and bag valve mask in the pediatric patient
4. Describe intubation differences in the pediatric population
5. State which medications can be given via the endotracheal tube.
6. Discuss the importance of proper BLS procedures-CPR, immobilization, O2 and temperature regulation
7. State the indications and procedures for intraosseous access
8. Explain the concept of a precalculated pharmacology system

## III. Discussion / Summary

The prognosis for the pediatric patient who suffers cardiac or respiratory arrest is poor; the only real way to reduce child deaths is to stress prevention. The most common causes are respiratory in nature, thus, in the nontraumatized patient it is imperative that providers manage the victim with excellent CPR, appropriate airway procedures and oxygenation, shock control, and initial medications where the patient lies to give the child the greatest chance of survival.

Things to keep in mind:

- Children may not be small adults- but the principles of care are unchanged. Circulation, Airway, and Breathing support can be accomplished rapidly and with little difficulty by the initial responding providers.

- Excellent ACLS with poor BLS is of no value. Immediate BLS management and CPR are of paramount importance.

- Medical codes should receive ALS treatment where the patient lies- Along with good CPR, oxygen, upgraded airway, intraosseous infusion, and initial pharmacology if possible within a reasonable time.

- Trauma is still treated in the operating room. Secure C-spine and airway "Load and Go" with secondary treatment, IV's and meds enroute.

- *Cool is the rule*! As our stress levels increase, our patient care levels decrease.

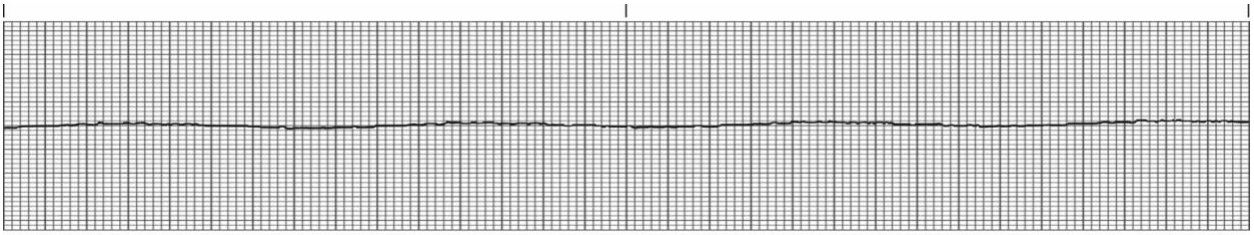
## Medications for Pediatric Cardiac Arrest & Symptomatic Arrhythmias

Note: The standard recommendation is to have some type of pre calculated drug chart or length based tape for dosing.

| Drug | Dose (pediatric) | Remarks |
|---|---|---|
| Adenosine | 0.1mg/kg IV/IO (max 6 mg)<br>Repeat dose 0.2mg/kg (max 12 mg) | Rapid IV/IO bolus<br>Rapid flush |
| Amiodarone<br>(pulseless VT/VF) | 5mg/kg IV/IO<br>May repeat dose up to 2 times | IV bolus |
| Amiodarone<br>(perfusing tachy rhythms) | Loading: 5mg/kg IV/IO<br>over 20-60 min | Repeat to max<br>15mg/kg/day IV |
| Ativan (Lorazepam) | 0.05-0.1 mg/kg IV/IO/IM | Max single dose 4mg |
| Atropine sulfate | 0.02 mg/kg IV/IO<br>May double for 2nd dose<br>ETT: 04-.06 mg/kg | Min dose: 0.1mg<br>Max single dose 0.5mg<br>ETT is 2-3 times IV dose |
| $Ca^{2+}$ chloride 10% | 20 mg/kg IV/IO (0.2ml/kg) | Give slowly |
| Dopamine<br>Dobutamine | 2-20 mcg/kg/min<br>2-20 mcg/kg/min | 1600 mcg/ml concentration<br>2000 mcg/ml concentration |
| Epinephrine for arrest<br>Or bradycardia | 0.01mg/kg IV/IO<br>*ETT: 0.1mg/kg (10 X's the IV dose) | Repeat every 3 – 5 min |
| Epinephrine infusion | 0.1-1 mcg/kg/min | Concentrations: 0.1 mg/ml (100 mcg/ml)<br>For 3-7 kg pts: 0.05 mg/ml (50 mcg/ml) |
| Glucose | 0.5-1 g/kg IV/IO | 10%= 5 -10ml/kg<br>25% = 2 - 4 ml/kg<br>50% = 1 – 2 ml/kg |
| Lidocaine | 1mg/kg IV/IO | Equally acceptable as Amiodarone in vf/pvt |
| Lidocaine infusion | 20-50mcg/kg/min<br>After 1mg/kg loading dose | Concentrations: 4000 mcg/ml<br>For 3 -7 kg pts: 8000 mcg/ml |
| Magnesium sulfate | 25-50 mg/min IV/IO over<br>10-20 min | Max dose 2g |
| Naloxone | 0.1mg/kg up to 2.0mg<br>IV/IO/IM | Titrate to desired effect |
| Procainamide | 15 mg/kg IV/IO | Give over 30 – 60 min |
| Sodium<br>Bicarbonate | 1mEq/kg per dose | Push slowly & only<br>If ventilation is adequate |
| Valium (Diazepam) | 0.1-0.3 mg/kg IV/IO or<br>0.5 mg/kg rectal | Max single dose 5 mg<br>(rectal max single dose 10 mg) |

*Endotracheal Tube (ETT) Meds: Lido, Epi, Atropine, Narcan and Vasopressin are acceptable as last resort

Recommended ETT Med Doses as follows:
Epinephrine @10 times the IV or IO route
Other drugs at 2-3 times the IV or IO route.



## Pediatric Asystole

*"Circle of Life"*
*Core Concepts of Resuscitation*

Assess C A B's & Begin CPR
Attach monitor / defibrillator
Administer Oxygen
Continually provide CPR in 2 min cycles
30 compressions/2 breaths 1 rescuer
15 compressions/2 breaths 2 rescuer
Stop briefly every 2 min to assess

↓

[Secondary procedures]
Secure Airway when appropriate / Monitor $CO_2$
Obtain Vascular Access

**Continually provide CPR in 2 min cycles then stop briefly to reassess rhythm**

↓

Epinephrine (give within 5 min of start of compressions)
IV/IO: 0.01 mg/kg 1:10,000

↓

Repeat Epinephrine Q 3-5 minutes

↓

Identify & treat causes:

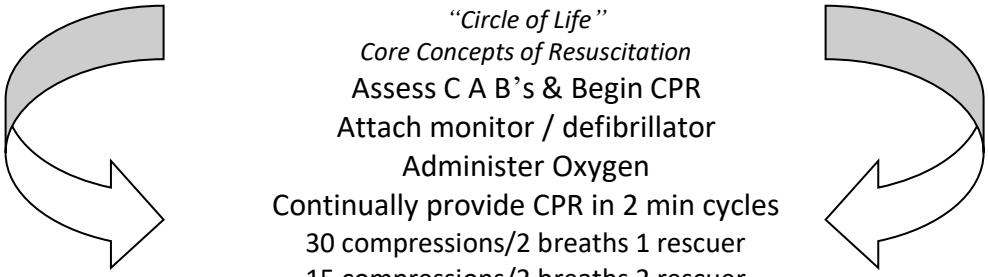
Anytime in the sequence

**H's**
Hypovolemia
Hypoxia
Hydrogen ions (acidosis)
Hypothermia
Hypo/hyperkalemia.
Hypoglycemia

**T's**
Toxins
Trauma
Tamponade (cardiac)
Tension pneumothorax
Thrombosis (pulmonary or coronary)
Too slow or too fast

# Pulseless Electrical Activity

Could be any rhythm other than pulseless VF or VT



*"Circle of Life"*
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30 compressions/2 breaths 1 rescuer
15 compressions/2 breaths 2 rescuer
Stop briefly every 2 min to assess

↓

[Secondary procedures]
Secure Airway when appropriate / Monitor $CO_2$
Obtain Vascular Access

↓

Epinephrine (give within 5 min of start of compressions)
IV/IO: 0.01 mg/kg 1:10,000

↓

Repeat Epinephrine Q 3 -5 minutes

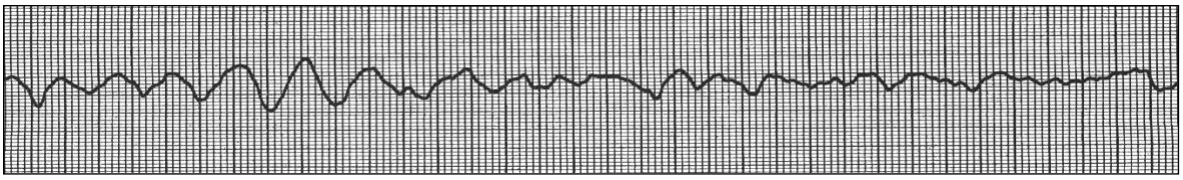
↓

Identify and treat causes:

Anytime in the sequence

**H's**
Hypovolemia
Hypoxia
Hydrogen ions (acidosis)
Hypothermia
Hypo/hyperkalemia.
Hypoglycemia

**T's**
Toxins
Trauma
Tamponade (cardiac)
Tension pneumothorax
Thrombosis (pulmonary or coronary)
Too slow or too fast



# Pediatric Ventricular Fibrillation/Pulseless Ventricular Tachycardia

*"Circle of Life"*
*Core Concepts of Resuscitation*

Assess C A B's & Begin CPR
Attach monitor / defibrillator
**Defibrillate 2 J/kg**
Administer Oxygen
Continually provide CPR in 2 min cycles
Stop briefly every 2 min to assess and defibrillate

↓

[Secondary procedures]
Secure Airway when appropriate / Monitor $CO_2$
Obtain Vascular Access

↓

Defibrillate 4 J/kg 2 minutes after first defibrillation

↓

Epinephrine
IV/IO: 0.01 mg/kg 1:10,000

↓

Defibrillate 4 J/kg if VF or pulseless VT

↓

Amiodarone 5mg/kg IV or IO →

May consider:
Lidocaine 1mg/kg (**equally effective as Amiodarone**)

or
Magnesium sulfate 25-50 mg/kg ONLY if Torsades **or** hypomagnesemia is suspected

↓

Defibrillate 4 J/kg if VF or pulseless VT

↓

Repeat Epinephrine every 3 -5 min at the same dose
Continue 2 min of CPR after each dose

↓

Defibrillate 4 J/kg

↓

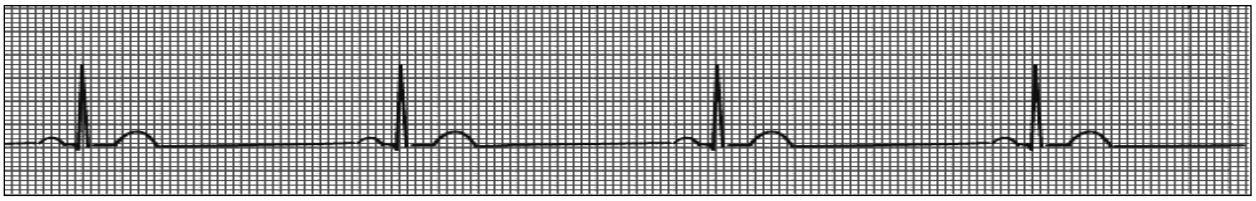
May repeat Amiodarone every 5 min up to 15mg/kg

↓

Defibrillate 4 J/kg
Identify and Treat causes between defibrillation

**Anytime in the sequence:**

**H's**-Hypovolemia, Hypoxia, Hydrogen ions (acidosis), Hypothermia, Hypo/hyper kalemia, Hypoglycemia
**T's**-Toxins, Trauma, Tamponade, Tension Pneumo, Thrombus (pulm or coronary), Too fast or too slow.



# Bradycardia

Cardiopulmonary Failure

Bradycardia (below 60/min) with Agonal Breathing

Assess C A B's
Ventilate
Administer oxygen as needed
Intubate when appropriate
Obtain vascular access
Assess vital signs

↓

Cardio-respiratory compromise?
Poor perfusion
Hypotension
Respiratory distress

↓

**No**
Observe
Support CAB's
Transport peds facility

**Yes**
Perform chest compressions if despite oxygenation & ventilation: Heart rate <60/min

**Continue CPR until rate sustains at greater than 60 min, ideally over 80 - 100**

↓

Epinephrine
IV/IO: 0.01 mg/kg 1:10,000

↓

Repeat Epinephrine every 3-5 minutes at same dose

↓

Atropine
0.02 mg/kg (usually not used in children < 1 year)
Min. dose:0.1 mg
Max single dose: 0.5 mg for child
1.0 mg for adolescent
May be repeated once

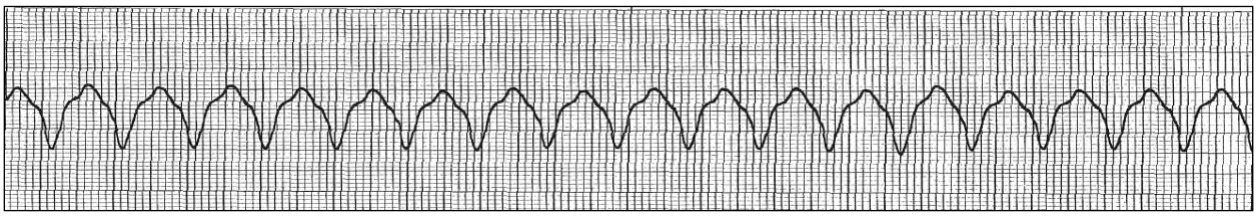
↓

Consider transthoracic/transvenous pacing

↓

Anytime in the sequence

Consider treatable causes:
Hypoxia
Increased vagal tone } the 2 most treatable causes
Hypoglycemia
Hypothermia
Herniation of brain stem



# Wide Complex Tachycardia (>.09 sec)
# Assumed to be
# Ventricular Tachycardia, Stable
# (no signs of shock)

**Asses C A B's**
Maintain airway
Oxygen, as needed
EKG and pulse oximeter
Assess vital signs

Consider 12 lead ECG and expert consult especially if stable

↓

**Establish vascular access**

↓

**Amiodarone 5 mg/kg over 20-60 min** → May consider:

Procainamide 15mg/kg over 30-60 min
or
Lidocaine 1mg/kg
(do not routinely administer multiple antiarrhythmic meds)

↓

**Successful conversion?**

**Yes** → Consider Expert Consult

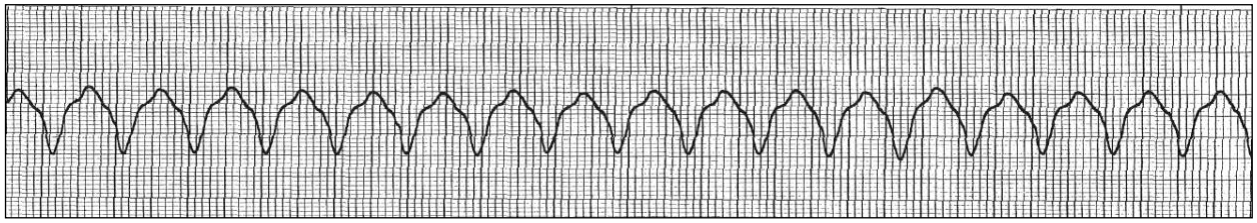
**No** ↓

Synchronized cardioversion 0.5 J/kg to 1 J/kg
(may increase to 2 J/kg)

↓

Consider Expert Consult

***May choose to try one dose of adenosine 0.1mg/kg to determine if the rhythm is SVT with aberrancy.***



# Wide Complex (>.09 sec)
# Assumed to be
# Ventricular Tachycardia, Unstable

**(signs of poor perfusion / shock)**

**Assess C A B's**

Maintain airway
Oxygen, as needed
EKG & pulse oximeter
Assess vital signs
Code equipment prepared

**Expert Consult & 12 lead ECG when available**

↓

Immediate synchronized cardioversion
0.5-1.0 J/kg
(consider sedation, do not delay cardioversion)

↓

Attempt 2nd synchronized cardioversion up to 2J/kg

↓

If unsuccessful or rapid reoccurrence

↓

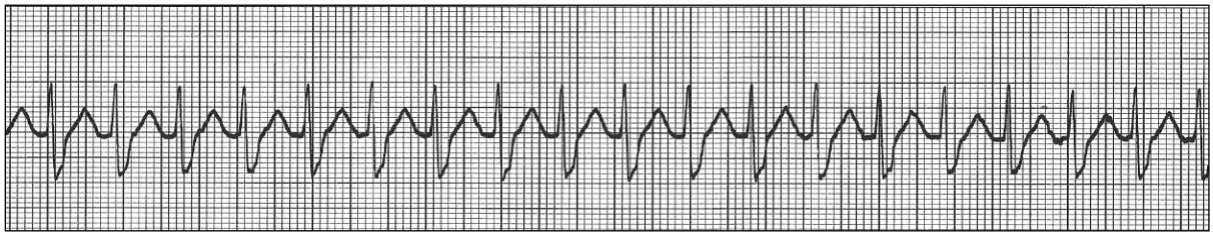
May consider:

Amiodarone 5mg/kg IV
over 20-60 min
or
Procainamide 15mg/kg IV
over 30-60 min
(do not routinely
administer multiple
antiarrhythmic meds)

↓

Then a 3rd synchronized cardioversion up to 2 J/kg

Rate: over 180 for children; over 220 for infants



# Narrow Complex Tachycardia

# Assumed to be

# Supraventricular Tachycardia, <u>Stable</u>

**Assess C A B's**

Maintain airway

Oxygen, as needed

EKG & pulse oximeter

Assess vital signs

**Consider 12 lead ECG & expert consult**

↓

Vagal maneuvers

(ice or straw)

↓

Establish vascular access

↓

Adenosine 0.1 mg/kg IV rapidly

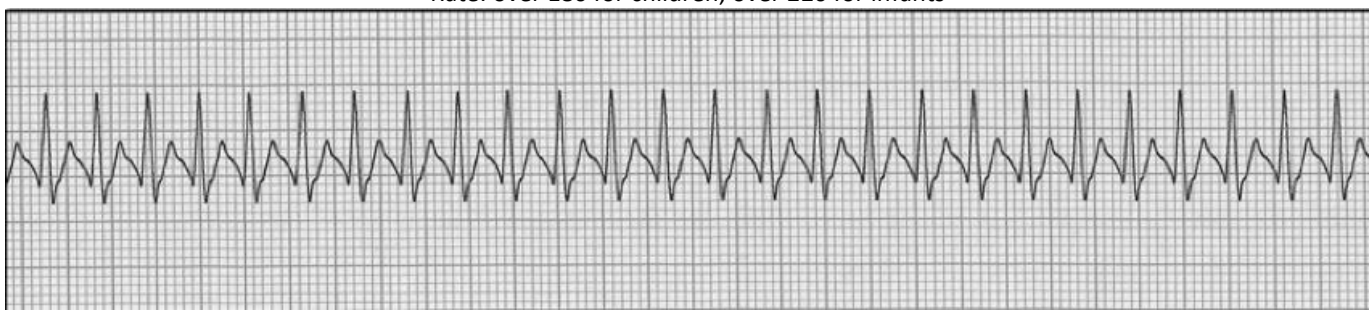
Followed by rapid flush

(may double dose and repeat x 1)

↓

**Expert pediatric consult asap**

Rate: over 180 for children; over 220 for infants



# Narrow Complex Tachycardia
# Supraventricular Tachycardia, Unstable

**(**signs of poor perfusion / shock)

**Assess C A B's**
Maintain Airway
Oxygen, as needed
Assess vital signs
Code equipment prepared

**Consider 12 lead ECG & expert consult when appropriate**

↓

Consider vagal maneuvers
if not critically unstable
(ice or straw)

↓

If IV/IO is already in place & pt is not critical
Adenosine 0.1mg/kg IV rapidly
followed by rapid flush
OR

↓

Synchronized cardioversion
0.5 - 1.0 J/kg
Sedate if possible (must not delay cardioversion)

↓

**If unsuccessful**
2nd synchronized cardioversion up to 2 joules/kg

↓

Then a 3rd synchronized cardioversion up to 2 J/kg

**May consider:**

Amiodarone 5mg/kg IV over 20-60 min
or
Procainamide 15mg/kg IV over 30-60 min
(do not routinely administer multiple antiarrhythmic meds)

# Pediatric Shock
# Poor perfusion pre or post resuscitation

Hypoperfusion from any cause

**Assess C A B's**

Maintain Airway
Administer Oxygen, as needed
Maintain body temperature
Monitor EKG & Pulse oximetry- frequent BP

**Emergency Vascular Access (IV or IO)**

Always assess for and treat hypoglycemia, hypocalcemia, and acidosis

## ASSESS FOR AND MAINTAIN AN ADEQUATE HEART RATE AND RHYTHM

**Shock from Trauma**

↓

20 ml/kg NS or LR Rapidly

↓

Continued signs of poor perfusion

↓

20 ml/kg NS or LR Rapidly

↓

Continued signs of poor perfusion

↓

3rd infusion of 20 ml/kg NS/LR

**or**

PRBC's in 10mL/kg boluses
or, Whole blood 20mL/kg
Repeat Q 20-30 min as needed

↓

Address the problem (surgery?)
and administer whole blood

**Cardiac Related Shock**

↓

5-10ml/kg NS or LR slowly
(provided lungs are clear)

↓

Continued signs of poor perfusion

↓

Along with 2nd fluid bolus
consider:

↓

Dopamine at 10 – 20 mcg/kg/min

or

Epinephrine 0.1 – 1mcg/kg/min
NorEpi 0.1 – 2 mcg/kg/min

↓

Consider expert consultation

**Septic Shock**

↓

10-20 ml/kg NS or LR (*5-20 min)*
3 – 4 x's in the first hour
Correct Glucose and Calcium level
Give broad spectrum antibiotic
within 1 hour

↓

Transfer to specialized ICU for
hemodynamic monitoring

↓

Consider:
Epinephrine 0.1 – 1 mcg/kg/min
**or** NorEpi 0.1 – 2 mcg/kg/min

↓

**ICU options** based Scv02 & B/P
*Norepinephrine/vasopressin
*Dobutamine or Dopamine
*Consider stress-dose
hydrocortisone

**Post Cardiac Arrest- Induced Targeted Temperature Management (TTM):**

For the resuscitated child who remains comatose, TTM *may be beneficial*. **(32 – 36°C / low 90's F)** For comatose children resuscitated out of hospital, it is reasonable to maintain either 5 days of normothermia (36-37°C) or 2 days of continuous hypothermia (32 – 34°C), followed by 3 days of normothermia. Current studies showed no difference in outcome after 1 year between randomized groups that received either hypothermia or normothermia. For children who were resuscitated in-hospital, there is insufficient data to recommend hypothermia over normothermia.

# Pediatric Post Resuscitation Care

Return of Spontaneous Circulation (ROSC)

**Optimize oxygenation and ventilation**

**Appropriate ETT placement-cuff preferred**
end tidal CO2 or capnography – tube is in airway

CXR – depth of insertion
**Maintain O2 sat 94-99%**
ensures adequate oxygenation
prevents risk of reperfusion injury related to excessive oxygen
**Ventilate to maintain CO2 levels appropriate to patient's condition**
monitor indirectly by capnography
monitor directly by ABG

**Optimize cardiac output** - *Cardiac output = stroke volume x heart rate*
*Stroke volume is determined by preload, contractility, and afterload*

**Increase preload** by administering fluid boluses

May not tolerate 20mL/kg due to poor myocardial function post arrest; try 5-10mL/kg over 10-20 min
**Improve contractility** by correcting hypoglycemia and/or electrolyte imbalances including hypocalcemia
Inotropes (dopamine) and/or Inodilators (milranone) may be needed
**Avoid hypotension** – treat with fluids and/or vasopressors
**Maintain HR appropriate for age** – aggressively treat any tachy or brady arrhythmias
**Maintain adequate hemoglobin concentrations**

**Optimize neurologic outcome**

**Aggressively treat hyperthermia, hypotension, hypoglycemia, and hypoxia** all of which can cause secondary brain injury.

**Aggressively treat seizures** which may result from: hypoglycemia, electrolyte imbalance, or underlying brain injury. Seizures increase the metabolic demand; correct the cause if possible.

Mild hypothermia is common post arrest and should not be aggressively treated.
Children resuscitated from out of hospital arrest should be maintained at either 5 days of normothermia (96.8-99.5oF) or 2 days of initial continuous hypothermia (89.6-93.2oF) then 3 days of normothermia.

**Transport as needed for most appropriate level of care.**

# Supplemental Info
# Special Needs Children

Medical and technological advances have allowed critically ill or injured children to live longer lives. Many of these 12 million children will be encountered at home, in schools, or in non-medical care facilities.

These patients present special challenges in assessment and management. The caretaker can be a great help in determining what is "normal" and what is unique for this particular patient.

Common technological support includes tracheostomies, ventilators, CSF shunts and gastrostomy tubes. Troubleshooting complications with these devices can be accomplished using a modified version of the DOPE mnemonic for evaluating ET tubes.

**Tracheostomy Tubes**

The patient may or may not have a patent upper airway allowing ventilation or oral intubation in the emergency setting. Another trach tube or a standard ET tube can be placed in the stoma if needed. Possible complications:

- **D – dislodged tube**
- **O – obstructed tube**
- **P – pneumothorax**
- **E – equipment failure**

**Home Ventilators**

The caregiver should be familiar with the ventilator type, function and settings for the child. Identifying and treating the causes of acute respiratory distress in the ventilator dependent patient must be done immediately. Possible causes of the deteriorating child who is ventilator dependent may include:

- **D – displaced or disconnected tubing or ET or trach tube**
- **O – obstruction of air flow – ventilator or trach tube**
- **P – pneumothorax or patient condition (i.e. – respiratory diseases)**
- **E – equipment failure – try to manually ventilate the patient**

**Central Venus Catheters**

These sites may have external ports requiring regular "flushing" or be placed under the skin showing a visible "port" which must be accessed through the skin and require monthly "flushing".
Common causes of CVC related complications include:

- **D – displacement or disconnection causing serious bleeding**
- **O – obstruction – clots or kinking of the catheter**
- **P – pulmonary embolus, pneumothorax, pericardial tamponade**
- **E – equipment failure – leaking, cracking or infection**

**Feeding Tubes**

Used for nutrition or medications in children who have nutritional, developmental or swallowing problems.
Potential complications for feeding catheters include:

- **D – displacement**
- **O – obstructed**
- **P – peritonitis, perforation, pneumoperitoneum**
- **E – equipment failure – the tubing or the feeding pump**

**CSF Shunts**

Used in patients who are unable to drain or reabsorb CSF from the ventricles in the brain. This may be due to medical conditions, trauma or neoplasms. The shunt is a catheter placed in the brain, which drains fluid to the abdominal or thoracic cavity for reabsorbtion. Emergencies involving CSF shunts may include:

- **D – displacement – patient may show signs of ↑ ICP**
- **O – obstruction – SI/SX include headache irritability, N/V, bulging fontanelle are signs of ↑ ICP**
- **P – peritonitis, perforation, pseudo cyst – all presenting as acute abdomen or shock**
- **E – equipment failure – leaking, kinking or cracking of the shunt causing signs of infection or ↑ ICP**

## Supplemental Info
## Common Pediatric Emergencies

### Seizures

Most common pediatric medical emergency
Fever is the most common cause

- Febrile seizures alone are not life threatening (but how do you know fever is truly the cause?)
- No alcohol or cool baths – these can lead to shivering and increase temp.

Status Epilepticus – 2 or more seizures without regain in consciousness or 1 continuous seizure lasting more than 15-20 minutes.

### Treatment

CAB's
Prevent Injury, Lateral recumbant position (for airway maintenance)-
Vascular access if unstable or in status seizures
Ativan IM or IV, IO (0.1mg/kg)
Midazolam IV,IN, IM, IO (0.1mg/kg)
Valium IV, IO (0.1-0.2mg/kg) or rectal (0.5mg/kg) or
Post seizure- may need to reposition and insert an oral airway & provide BVM if unresponsive.
Most seizures last less than 5 minutes and need no treatment except opening the airway, suction, and O2

### Fever

Remove clothing
Tylenol (15mg/kg) or Motrin (10mg/kg)

**AVPU Pediatric Response Scale**
Rapid evaluation of cerebral cortex function:
**A**lert- awake and appropriate
**V**oice- responds only to voice
**P**ainful- responds only to painful stimuli
**U**nresponsive- no response to stimuli

### Sepsis

Initially manage shock and fever
Appropriate antibiotics
Consider sepsis specific facility

### Meningitis

Watch for S/S of increased ICP
May be life threatening if not caught early

### Symptoms

Fever (may be only presenting symptom in infant)
Bulging fontanel
Irritability
Lethargy
Nuchal rigidity
S/S increased ICP

### Treatment

Initially manage shock, ICP, and fever
Appropriate labs
Appropriate antibiotics

# Head Injuries

Common in Pediatrics – large head compared to body

## Concussion

Pathophysiology
Swelling – no actual damage to brain tissue

### Assessment

Vomiting
Sleepiness---with altered mental status, always check glucose!
Neuro checks WNL

### Management

CAB's
Observe for:

- S/S increased ICP
- S/S hemorrhage/contusion

## Intracranial Hemorrhage/Contusion

Pathophysiology- Bleeding within the brain tissue

### Assessment

S/S of concussion + neuro deficits
Lethargy or loss of consciousness
Seizures
Unequal or sluggish pupils
Hemiparesis, hemiparalysis

### Management

CAB's
Close observation
Surgical intervention

## Increased Intracranial Pressure

**Assessment** (Cushing's Triad)
Hypertension
Bradycardia
Irregular respirations

### Management

CAB's
Consider elevating head
Maintain adequate ventilations ($pCO_2$ approx. 30)
Hyperventilation reserved for rapidly deteriorating patients (may need rapid surgical intervention)
Corticosteroids
Mannitol may be considered by some if no bleed

# Respiratory Distress

"Noisy breathing is obstructed breathing"

Managing the respiratory distress is more important than diagnosing

**Croup**
Usually < 3 yrs old
Infection
"Sick" for a couple of days
Low grade fever
Not "toxic" appearing

**Epiglottitis**
Usually 3-6 yrs old
Drooling/dysphagia
Sudden onset
High fever
"Toxic" appearing
"Tripod"

**Upper Airway Obstruction**-other may be caused by swelling, or foreign body obstruction or anaphylaxis(nuts, bee stings etc.)

Both
Stridor
"Barky" cough

**Asthma**
RAD (reactive airway disease) – bronchoconstriction
Tightness reduces airflow and thus may decrease wheezing

**Pneumonia / Bronchiolitis**
Infiltrates
Respiratory distress with coarse breath sounds, rales, rhonchi, and possibly wheezing

General management
Psychological first aid
Airway as appropriate – position of comfort → sniffing position
$O_2$ as tolerated – blow by → BVM → ETT
Pulse oximeter, cardiorespiratory monitor
Initial IV therapy may be delayed
Nebulizer treatments

- Bronchodilators, for asthma, and possibly pneumonia and bronchiolitis
  - (Albuterol 1.25-2.5 mg/dose)
- Racemic epinephrine 0.05mL/kg/dose for croup (not used for epiglottitis)

Steroids for croup

# SIDS

Sudden Infant Death Syndrome (SIDS) is the sudden and unexplained death of an infant under one year of age.

SIDS, sometimes known as "crib death", is the major cause of death in babies from 1 month to 2 year of age. The death is sudden and unpredictable, most often in a seemingly healthy baby, and usually during sleep. Most SIDS deaths occur between ages 1 and 4 months, affecting more boys than girls, and occurring more often in the fall, winter and early spring months.

**Reducing the Risk of SIDS**

Sleep position

- Unless contraindicated, healthy babies should sleep on their backs
- If the side lying sleep position is chosen, the baby's lower arm should be positioned forward to prevent him from rolling into a prone position

Sleep surface

- The baby should sleep on a firm mattress. Fluffy blankets, waterbeds, sheepskin, or pillows should not be used as a sleep surface

Temperature

- Room temperature should be moderate; not cold, but not warmer than is comfortable for adults Smoke free environment
- Babies and young children exposed to smoke have higher incidence of colds and other respiratory infections, as well as increased risk for SIDS

Routine healthcare

- Routine well and sick baby visits as well as receiving vaccinations on time reduce the risk of SIDS

Prenatal care

- Early and regular prenatal care can help reduce the risk of SIDS
- The risk of SIDS is higher for babies whose mothers smoked during pregnancy

Breastfeeding

- Breastfeeding provides enhanced immune protection for infants

# Written Pre Course Examination

1. You are called to evaluate a 9 month old infant. You have assessed that the infant is unresponsive and are now simultaneously checking for breathing and pulse. Where are you palpating for a pulse and how long should it take?

A. Carotid, not more than 10 seconds
B. Brachial, not more than 20 seconds
C. Carotid, not more than 15 seconds
D. Brachial, not more than 10 seconds

2. A 2 year old is brought into the emergency room following a fall from his highchair. The child is unresponsive and has slow, irregular respirations. What is the most likely cause of this child's respiratory failure?

A. Upper airway obstruction
B. Disordered control of breathing
C. Blunt chest trauma
D. Lower airway obstruction

***Use the following scenario to answer the next 2 questions:***
A 4 year old child with a 3 day history of vomiting, diarrhea, and poor PO intake is brought into the ER by her dad. She is afebrile, heart rate is 132, respirations are 22 and unlabored, capillary refill is 5, central pulses are present, peripheral pulses are weak, blood pressure is 80/52.

3. You determine that this child is in:

A. Hypovolemic shock
B. Obstructive shock
C. Distributive, septic shock
D. Cardiogenic shock

4. She has received 4 normal saline boluses of 20mL/kg. Her heart rate is 90/min and capillary refill is < 2 seconds, but she remains very lethargic. Which diagnostic test should be done first?

A. CT scan of the brain
B. EEG
C. Blood glucose
D. ABG

***Use the following scenario to answer the next 2 questions:***
Due to a cluster of seizures at home, a 6 year old girl is given Diastat (rectal diazepam gel) by her dad. He called EMS because her seizures continued. The child received IV lorazepam en route and is no longer seizing on arrival to the ER. She is unresponsive with snoring respirations, rate of 6/min and poor chest rise.

5. Your best initial intervention is:

A. Reposition and insert and oral airway
B. Administer flumazenil
C. Administer naloxone
D. Apply O2 via nonrebreather mask

6. Post resuscitative care includes monitoring the patient's O2 saturation. Which of the following saturation is best recommended?

A. 94-99%
B: 95-100%
C. >94%
D. >97%

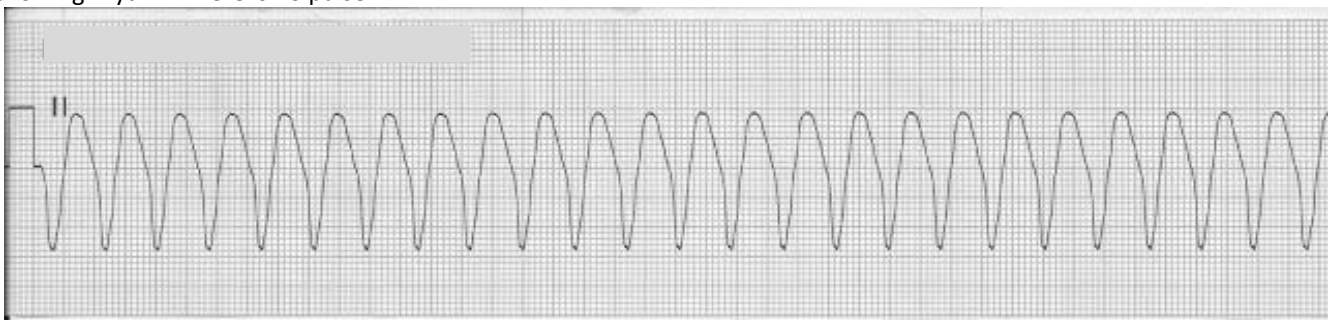
7. You are a member of the code team responding to a code in pediatrics. On arrival, high quality one person CPR is being correctly performed on a 3 year old boy with a ratio of _____. Now that the team has arrived, 2 person CPR will begin with a ratio of _____.

A. 15:2, 30:2
B. 30:2, 15:2
C. 15:2, 5:1
D. 30:2 for both

8. In spite of positioning and oral airway insertion an unresponsive patient's respirations are slow and irregular. What should be your next intervention?

A. Apply O2 via nonrebreather mask
B. Perform endotracheal intubation
C. Provide bag-mask ventilation
D. administer albuterol sulfate via nebulizer

9. You are the team leader during a resuscitation attempt on a 7 year old child. The monitor is just applied and shows the following rhythm. There is no pulse.




You instruct the team to defibrillate at _____. Your next instruction should be _____.

A. 2 J/kg, Recheck the rhythm
B. 1 J/kg, Administer Amioderone
C. 4 J/kg, Check for a pulse
D. 2 J/kg, Resume compressions

10. Which of the following is not an element of high quality pediatric CPR?

A. Compression rate of 100-120/min
B. Compression depth of 1/4 – 1/3 the depth of the chest
C. Allowing complete recoil between compressions
D. Pulse checks every 2 minutes

***Use the following scenario to answer the next 5 questions:***

An 8 year old oncology patient presents to the ER with a fever that started this morning. The child is lethargic. Axillary temp is 102.7, heart rate 144, respiratory rate 26 with increased work of breathing, blood pressure 80/52, pulses are bounding with capillary refill <2. Chemistry drawn on arrival shows lactic acidosis.

11. You accurately assess _____ because _____.

A. Hypotensive shock, systolic blood pressure is < 86
B. Compensated shock, systolic blood pressure is > 70
C. No shock, the capillary refill is <2
D. Cardiogenic shock, the heart rate is > 140

12. This child is mostly likely in:

A. Hypovolemic shock
B. Distributive, neurogenic shock
C. Distributive, Septic shock
D. Obstructive shock

13. Which of the following is the best indicator of the severity of the shock?
    A. Blood pressure
    B. Heart rate
    C. Temperature
    D. Capillary refill

14. You have decided to give this child a fluid bolus. Which of the following would you give?
    A. 20mL/kg 5% dextrose in 0.45% normal saline over 1 hour
    B. 20mL/kg normal saline over < 20 min
    C. 10mL/kg lactated ringers over 30 min
    D. 15mL/kg 5% dextrose in water over 1 hour

15. What else should this child receive within a short time of arrival to the ER?
    A. Cardiology consult
    B. Chest x-ray
    C. Neurology consult
    D. Broad spectrum antibiotic

16. You are asked to perform in a role that is outside your scope of practice and therefore ask for a different role. This is an example of:
    A. Knowing your limitations
    B. Expecting special treatment
    C. Not being a team player
    D. Being too lazy to learn new roles

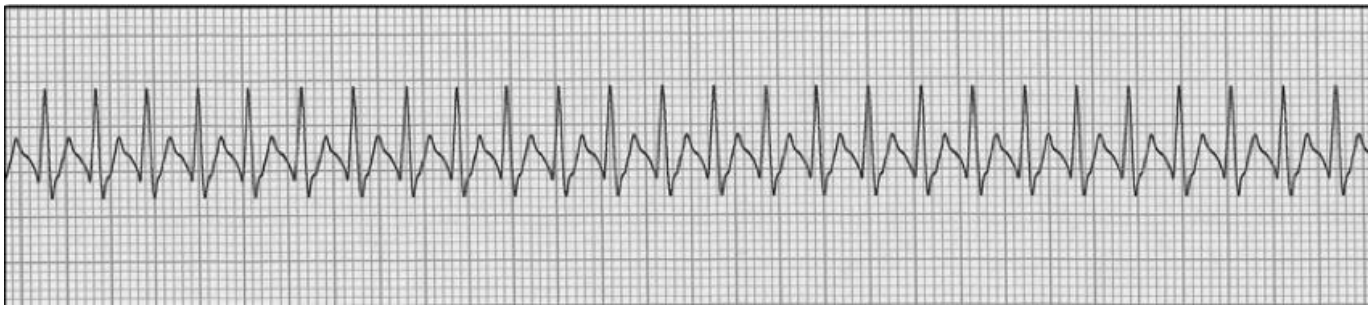
17. You are assessing a child with increased respiratory effort. On auscultation you hear crackles (rales). This helps you identify that this child has:
    A. Lower airway obstruction
    B. Upper airway obstruction
    C. Disordered control of breathing
    D. Lung tissue disease

18. Which of the following would indicate upper airway obstruction?
    A. Crackles (rales)
    B. Increased inspiratory effort and stridor
    C. Prolonged expiratory phase and wheezing
    D. Slow, irregular respirations

19. A 1 year old child is in cardiac arrest and does not have an IV site. What is your best intervention?
    A. Immediately insert an IO
    B. Give epinephrine via the ETT
    C. Have 2 people try repeatedly to start an IV
    D. Ask the doctor to insert a central line

20. While providing care at a camp, you discover a 6 year old child unresponsive with no pulse. You shout for help but no one comes. You should:
    A. Leave the child to activate EMS, then return and perform CPR
    B. Do CPR while continuing to shout for help hoping someone hears you
    C. Do CPR for 2 minutes, leave to activate EMS, restart CPR
    D. Activate EMS after doing CPR for 10 minutes

***Use the following scenario to answer the next 2 questions:***
A Grandmother brings an unresponsive 10 month old to the ER. The baby's skin is cool and pale, capillary refill is 6 seconds, respirations are labored with retractions and insp crackles (rales) auscultated in the bases, blood pressure is 64/40. The monitor shows the following with a heart rate of 260/min.



21. This condition describes:
    A. Unstable supraventricular tachycardia
    B. Stable supraventricular tachycardia
    C. Ventricular tachycardia
    D. Sinus tachycardia

22. Immediate treatment is:
    A. Start an IV, give adenosine slow IV push
    B. 20mL/kg normal saline bolus
    C. Defibrillation at 2 J/kg
    D. Synchronized cardioversion at 0.5-1 J/kg

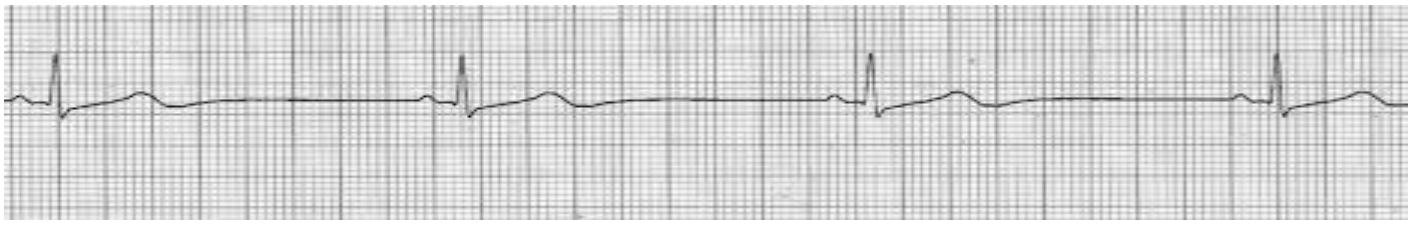
23. Which of the following children needs immediate attention?
    A. 2 year old with a temperature of 99.9$^{o}$F
    B. 5 year old with nasal congestion and O2 sat 95% on room air
    C. 4 year old with blood pressure 88/50
    D. 10 month old with head bobbing and grunting

24. You are assessing a 1 year old with the following vital signs:
heart rate 120, respiratory rate 30, blood pressure 84/56. Which of these indicates a problem?
    A. None, these are all normal values
    B. Heart rate
    C. Respiratory rate
    D. Blood pressure

25. Using the AVPU scale, how would you document LOC for an 18 month old sitting on mom's lap looking around, who cries when you approach and is easily consoled by mom?
    A. Awake
    B. Voice
    C. Pain
    D. Unresponsive

***Use the following scenario to answer the next 3 questions:***

An unresponsive 7 year old girl is brought in to the ER by mom. Her skin is cool and cyanotic, respiratory rate is 6, her O2 sat is 86% on room air and her blood pressure is 74/38. Central pulses are weak,peripheral pulses are absent. The monitor displays the following rhythm:



26. What rhythm is most consistent with the above strip and clinical presentation?
    A. PEA
    B. Sinus bradycardia
    C. Normal sinus rhythm
    D. Third degree heart block

27. What is the most common cause of this rhythm in infants and children?
    A. Drug overdose
    B. Hyperglycemia
    C. Dehydration
    D. Hypoxia

28. What should your initial action be?
    A. Fluid bolus with 20mL/kg normal saline
    B. Cardioversion with 0.5-1 J/kg
    C. Provide bag-mask ventilation with 100% O2
    D. Administer narcan

29. Which of the following is indicative of respiratory failure in a 9 year old child?
    A. Productive cough with inspiratory crackes (rales) heard on ausculation
    B. O2 sat of 68% on room air and 84% on O2 via nonrebreather
    C. Prolonged expiratory phase with end expiratory wheezing heard on auscultation
    D. Respiratory rate of 32 with accessory muscle use

30. A 3 year old boy is brought in to the ER by dad with a 2 day history of low grade fevers and barky cough. As you enter the room you see that the child is alert, skin is pink, and his respirations are labored with suprasternal retractions and stridor. What medication would you give first?
    A. Nebulized albuterol
    B. Broad spectrum antibiotic
    C. Nebulized epinephrine
    D. Tylenol

31. What would you expect to assess in a child with lower airway obstruction?
    A. Increased inspiratory effort and stridor
    B. Slow, irregular respiratory pattern
    C. Retractions and crackles (rales) on auscultation
    D. Prolonged expiratory phase and wheezing

32. During a code the team leader instructs you to give a medication dose that you believe to be incorrect. How would you respond?
    A. Give the dose you are told to give; the team leader is in charge.
    B. Refuse saying, "I can't give that. It's the wrong dose".
    C. Give the med in the dose you believe to be correct.
    D. Tactfully clarify by saying, "did you mean to say _____"

33. An unresponsive 5 year old is brought into the emergency room. Skin is cool and cyanotic. There are no palpable pulses. The monitor shows the following rhythm.

What is this condition?

A. Normal sinus rhythm
B. PEA
C. Sinus bradycardia
D. First degree heart block

34. You are assessing a 10 year old boy brought to the ER after falling out of a tree. What finding would indicate to you that immediate intervention is needed?

A. Sytolic blood pressure of 94
B. Heart rate of 88
C. Warm, moist skin
D. Decreased level of consciousness

35. A lethargic 2 year old is brought into the ER by her mom. She has a respiratory rate of 76 with deep retractions and nasal flaring. O2 sat is 94% on room air. She is afebrile, her skin is warm and dry, capillary refill is brisk. As you bring her back to a room you notice that her respirations have become less labored and her respiratory rate has dropped to 20. This is an indication that:

A. The child is going into respiratory failure
B. The child is improving
C. The child is going into shock
D. The child is feeling less anxious since she is at the hospital

36. Which of the following children is in respiratory distress?

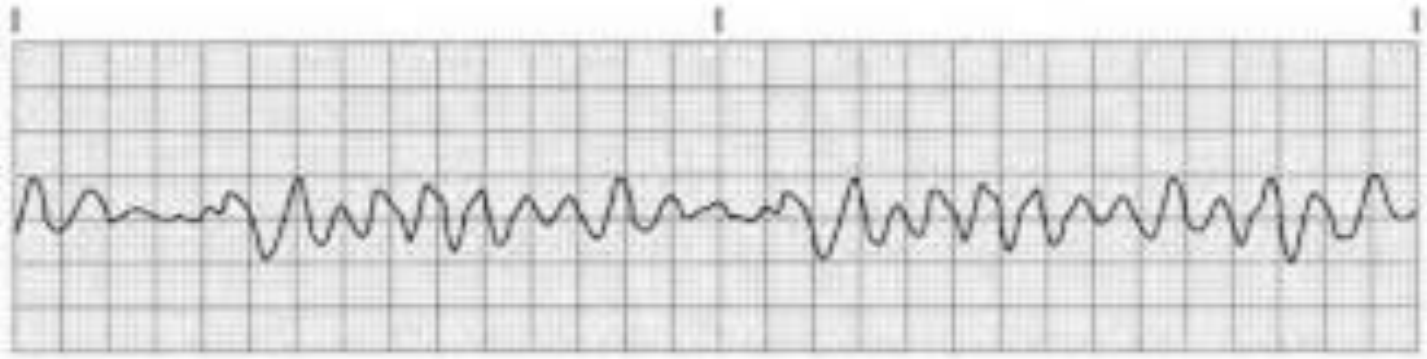
A. 4 year old with audible inspiratory stridor
B. 2 year old with a head injury decreased respiratory effort and a respiratory rate of 10
C. 7 year old with an O2 sat of 97%
D. 2 month old with a respiratory rate of 50

37. You are evaluating an 11 year old with a known allergy to bee stings who was brought in after encountering a swarm of bees and being stung several times. Which of the following would you be likely to see?

A. Lung tissue disease
B. Hypovolemic shock
C. Upper airway and possibly lower airway obstruction
D. Disordered control of breathing

***Use the following scenario to answer the next 3 questions:***

Your patient is an unresponsive 3 year old girl. Her skin is cool and cyanotic. She is not breathing and has no palpable pulses. Your team begins high quality CPR. You attach a monitor and the following rhythm is displayed:



38. What is this rhythm?
    - A. Ventricular tachycardia
    - B. Supraventricular tachycardia
    - C. Asystole
    - D. Ventricular Fibrillation

39. Your priority is:
    - A. Defibrillate at 2 J/kg
    - B. Fluid bolus of 20mL/kg over 5-10min
    - C. Synchronized cardiovert at 0.5-1 J/kg
    - D. Administer adenosine 0.1mg/kg

40. There is no change. Your team continues high quality CPR. What would you do next?
    - A. Defibrillate at 4 J/kg
    - B. Fluid bolus of 20mL/kg over 5-10min
    - C. Synchronized cardiovert at 0.5-1 J/kg
    - D. Administer adenosine 0.1mg/kg

ANSWER SHEET PRETEST

PALS Written Evaluation

1. D
2. B
3. A
4. C
5. A
6. A
7. B
8. C
9. D
10. B
11. A
12. C
13. A
14. B
15. D
16. A
17. D
18. B
19. A
20. C
21. A
22. D
23. D
24. A
25. A
26. B
27. D
28. C
29. B
30. C
31. D
32. D
33. B
34. D
35. A
36. A
37. C
38. D
39. A
40. A

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# The following pages contain a Pretest for anyone choosing to complete the BLS course <u>after</u> ACLS or PALS.

This information in this packet comes from the 2020 BLS textbook; Please use the book to review.

You must score an 84% (-5)
In order to take this program

**Completing these test questions <u>prior to the course</u> is mandatory if you plan on attending the CPR section after the PALS program.**

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# Skills Review for Healthcare Providers
# The CAB's of CPR

**Simultaneously Determine unresponsiveness and check for <u>effective</u> breathing**
If unresponsive: call a "code" or 911

**C = Circulation-** Check for a pulse Max - 10 seconds. If pulse is not <u>definite</u>, begin compressions.
**A = Airway-** Open airway (head tilt/chin lift)
**B = Breaths-** Give 2 breaths then back to compressions
D = Defibrillator- Attach a manual defibrillator or AED

**CPR Reference**

| | Adults (> puberty) | Children (1 - puberty) | Infants (< 1yr) |
|---|---|---|---|
| **Rescue breathing, Victim definitely has a pulse** | 10 breaths/min<br>recheck pulse every 2 minutes | 20-30 breaths/min<br>recheck pulse every 2 minutes | 20-30 breaths/min<br>recheck pulse every 2 minutes |
| **Compression landmark**<br>**No pulse**<br>(or pulse <60 in infant or child with poor perfusion) | Middle of the chest,<br>between the nipples | Middle of the chest,<br>between the nipples | 1 finger below nipple line |
| **Compressions are performed with** | Heel of 2 hands | Heel of 1 or 2 hands | 2 fingers OR<br>2 thumbs when using encircling hands technique |
| **Rate of compressions per minute** | 100-120/min | 100-120/min | 100-120/min |
| **Compression depth** | At least 2 inches<br>↑ 2 inches | At least 1/3 depth of chest<br>2 inches | At least 1/3 depth of chest<br>1 ½ inches |
| **Ratio of compressions to breaths**<br>**Once an advanced airway is placed ventilations will be 1 every 6 sec. with continual compressions.* | 30:2<br>Change compressors and reevaluate every 2 min | 30:2<br>15:2 if 2 rescuer<br>Change compressors and reevaluate every 2 min | 30:2<br>15:2 if 2 rescuer<br>Change compressors and reevaluate every 2 min |

## Foreign Body Airway Obstruction

** If not rapidly removed call Emergency Medical Service **

### Conscious choking

| Adult | Child | Infant |
|---|---|---|
| Abdominal Thrusts<br>*(Red Cross Class – 5 Back Blows)* | Abdominal Thrusts<br>*(Red Cross Class – 5 Back Blows)* | 5 Back Blows/5 Chest Thrusts |

### Unconscious choking

| Adult | Child | Infant |
|---|---|---|
| Call a "code"<br>or call 911<br>Begin CAB's of CPR<br>Before giving breaths:<br>look in mouth for foreign body,<br>remove object if it is seen.<br><br>Repeat cycles of CPR if needed | Begin CPR<br>If second rescuer is present,<br>send them to call a "code" or 911,<br>otherwise, call after 2 min of CPR<br>Before giving breaths:<br>look in mouth for foreign body,<br>remove object if it is seen.<br><br>Repeat cycles of CPR if needed | Begin CPR<br>If second rescuer is present,<br>send them to call a "code" or 911,<br>otherwise, call after 2 min of CPR<br>Before giving breaths:<br>look in mouth for foreign body,<br>remove object if it is seen.<br><br>Repeat cycles of CPR if needed |

# 2020 Outcome Driven Notes

Rapid Response teams are essential to improve patient outcomes by identifying and treating early clinical deterioration.

**CPR Coach-** helps the resuscitation team perform high quality CPR
Provides interactive feedback about the rate, depth, and recoil of compressions.
Monitors ventilatory performance & minimizes pauses in CPR. Optimizes CCF.

The following efforts increase the **chest compression fraction (CCF),** which ideally minimizes the hands-off time during CPR.

- ✓ Pre-charge the defibrillator 15 sec before rhythm check/shock is due
- ✓ Compressor hovers over, but off, the chest during defibrillation
- ✓ Intubate without delay in compressions
- ✓ Try to keep other stops at 5 sec or less (10 is still acceptable)
- ✓ Administer meds during compressions

**Immediate Actions for a Suspected Heart Attack Victim:** (Chest or arm pain/pressure**,** short of breath, anxious)

Considered a time critical emergency. Take the following actions immediately:

1. Have the victim sit down & remain calm
2. Activate the EMS system- get the AED, if available.
3. Suggest that alert adults chew and swallow an aspirin. This is contraindicated if known allergy or advised to avoid aspirin by a healthcare provider.
4. If the patient loses consciousness and is not breathing, or only gasping---START CPR

**Suspected Stroke? Act Fast!**

Every 40 seconds, someone in the United States suffers a stroke. Know the signs: (FAST)

1. **F**ace Drooping
2. **A**rm Weakness
3. **S**peech difficulty
4. **T**ime to phone

There are possibly other signs so consider this also a critical emergency!

1. Quickly evaluate for obvious signs
2. Activate the EMS system
3. Find out when symptoms first appeared
4. Stay with the individual, until help arrives
5. Loss of consciousness & not breathing or only gasping? = START CPR

# INFORMATION TO KEEP IN MIND:

1. Know the maximum time that should be spent checking for the presence of a pulse.

2. Know the preferred techniques/devices for providing ventilations if you are a single rescuer versus having multiple resources in the professional setting.

3. Know the concept of scene safety/awareness before providing care.

4. Know which patients require ventilations and which require ventilations plus compressions.

5. Know the best way to open the airway for an Adult, Child, Infant or spinally injured patient.

6. Know the location, depth and rate of compressions for an Adult, Child and Infant.

7. Know when to start compressions for an Adult, Child and Infant, be able to explain chest recoil (release) and high-quality CPR.

8. Know the compression to ventilation ratio for both 1 and 2-rescuer for Adult, Child and Infant.

9. Know how to reduce the incidence of air being introduced into the patient's stomach versus their lungs.

10. Understand how an AED affects the heart (shock to organize the rhythm) and know the steps for using an AED on an Adult, Child or Infant; pediatric use and placement.

11. Know how to incorporate CPR before, during and after AED use.

12. Know the changes in CPR, which are incorporated once a victim has an advanced airway "tube" placed by a medical professional.

13. Know the sequence, procedures and roles for 1 rescuer versus 2-rescuer CPR.

14. Know the procedures for conscious and unconscious choking for Adult, Child and Infant.

15. Know how to determine effectiveness of ventilations and compressions being provided during CPR

16. Know the elements of effective team dynamics and communicating during an emergency
.

17. Know that in Opioid OD's CPR is still most important for no breathing or pulse, but Naloxone can be administered along with CPR.

18. Know that in late pregnancy, during CPR the fetus should be shifted to the left if possible. If resuscitated, lay patient on the left side.

19. No need to remove jewelry to defib—just relocate the defib pad.

# BLS Pre-Course Exam

1. An elderly woman collapses to the floor in a bingo hall. Your first action should be:

A. Open the airway and give 2 breaths. (mouth to mouth rapid is best)
B. Go grab the defibrillator off the wall in the hallway.
C. Yell out/ call for help while simultaneously assessing for pulse and respirations. (carotid or femoral is best)
D. Check for a carotid or radial pulse.

2. You are performing 1 rescuer CPR on a 75-year-old female with a history of chest pain and diabetes. An AED has just been made available to you. What is the first action that you should take at this time?

A. Finish the 5 cycles of chest compressions that you have started.
B. Place the AED pads on the chest.
C. Secure an electrical outlet to plug the AED into.
D. Turn the AED on.

3. You are attending a birthday party when an infant suddenly starts choking on a hotdog. What should you do if he is not breathing and cannot breathe?

A. Administer 2 rescue breaths using a barrier device.
B. Perform a blind sweep of the victim's mouth using a soft cloth to keep him from biting.
C. Deliver 2 back-slaps followed by looking into the mouth.
D. Perform back slaps and chest thrusts.

4. Opioids are medications that are used to treat pain but have a high potential for abuse. Addiction rate to the medications is a growing problem and they can cause respiratory and or cardiac arrests. While the first and most important step is to perform CPR, what is the name of the medication that is utilized to reverse the effects of respiratory depression?

A. Naloxone.
B. Ativan.
C. Lasix.
D. Magnesium Sulfate.

5. Your middle age neighbor is mowing his grass when he clutches his chest and drops to the ground. He has no pulse or respirations. Your son calls 911 while you initiate chest CPR. How fast should the compression rate be?

A. 100 compressions per minute.
B. 100-120 compressions per minute.
C. 80-100 compressions per minute
D. 120-150 compressions per minute.

6. Bystanders have pulled a young woman with a pulse but no respirations out of a lake. One of them is administering rescue breaths at a rate of one every 5-6 seconds while waiting for EMS to arrive. Which of the following is true about rescue breaths?

A. Each breath should result in visible chest rise.
B. Give each breath over 1 second.
C. The pulse should be checked every 2 minutes.
D. All of the above.

7. Which of the following situations will slightly delay AED usage while the situation is made safe for AED application?

A. A person found lying on a metal floor inside a meat cooler.
B. A person found submerged in a bathtub.
C. A person who collapsed in snow.
D. A person who has a transdermal nitro patch on their arm.
E. The patient being in late stage pregnancy.

8. When utilizing a bag valve mask device it is important to remember:

A. That this device requires training and is best suited for a 2-rescuer situation.
B. The E-C clamp technique should be used while lifting the jaw to provide a good seal.
C. To squeeze the bag for 1 second while watching the chest rise.
D. All of the above.

9. What is the correct ratio for compressions to ventilations in infant CPR with 2 rescuers present?

A. 20 compressions to 4 breaths.
B. 15 compressions to 2 breaths.
C. The rate remains 30 compressions to 2 breaths.
D. 15 compressions to 1 breath.

10. The maximum amount of time that should be taken to check for a pulse or perform any procedure on an adult, infant or child in cardiac arrest is?

A. 15 seconds
B. 10 seconds
C. 30 seconds
D. 5 seconds

11. You are watching a resuscitation attempt at a medical facility. You observe the hand placement of the person who is providing compressions to be incorrect. Your next step as a team member should be?

A. Wait 10 seconds to see if the team leader notices.
B. Tell the person doing compressions that you will take over.
C. Alert the team leader for him/her to address.
D. Tell another team member to take over.

12. While providing CPR to a child or adult, an AED becomes available and a shock is indicated and administered. (Since it is OK to shock children with adult AED pads if necessary), what should you do next?

A. Administer 2 more shocks; to total 3.
B. Immediately restart CPR, starting with compressions.
C. Give 2 breaths first then resume CPR.
D. Check the carotid pulse for no longer than 10 seconds.

13. What is the purpose of defibrillation?

A. To stop a chaotic rhythm and restore the heart's normal rhythm.
B. To increase the rate of complete heart block.
C. To provide a blood pressure.
D. To treat cardiac standstill.

14. Current guidelines suggest that adult compressions should be administered at a depth of at least 2 inches. Which of the following is not true regarding chest compression depth?

A. Compressions are often delivered too hard rather than too shallow.
B. It may be difficult to accurately judge compression depth without the use of a feedback device.
C. Consistent compression depth of at least 2 inches is associated with better outcomes.
D. Potential complications can occur at depths of greater than 2.4 inches.

15. When 2 or more personnel are available during a resuscitation, the team should

A. Have the strongest person continue compressions.
B. Ventilate slightly faster.
C. Perform 1 minute of rapid compressions, then slightly slower.
D. Change compressions every 2 minutes.

16. You begin your shift on the med/surg floor. You begin your rounds and when you walk into a patient's room, you notice the patient has agonal respirations. What should you do if following the concepts of resuscitation?

A. Give the patient oxygen. (Airway, Revive, Care)
B. Check a pulse and begin compressions if indicated. (Assess, Recognize, Care)
C. Do nothing, the patient is asleep. (Accept, Care, Revive)
D. Begin the Heimlich maneuver. (Assess, Airway, Complete)

17. When is the two-thumb encircling technique is used?

A. During infant CPR (if your hands are big enough).
B. When the infant is choking.
C. When performing CPR on a pediatric victim.
D. When performing one rescuer CPR on an infant and you become tired.

18. At the beginning of your work shift, your team leader assigns you the role of compressor during a cardiac arrest. This is known as:

A. Mutual respect.
B. Closed loop communications.
C. Clear roles and responsibilities.
D. Constructive intervention.

19. While assisting with a cardiac arrest, you are instructed to take over bag valve mask ventilations. You repeat back "you would like for me to take over bag valve mask ventilations." In team dynamics, what is this called?

A. Closed loop communications
B. Knowing your limitations
C. Knowledge sharing
D. Mutual respect

20. A person is found lying next to an electrical line, unresponsive. You assure that the power is disconnected before you attempt resuscitation. In this case, you identified the information you saw, and took appropriate action. This concept of taking action based on information gathered is called?

A. Critical thinking.
B. Unified team approach.
C. Problem identification.
D. Solving issues.

21. You arrive to find a hospital maintenance worker lying on the ground, next to a ladder. He appears unconscious, your first action should be?

A. Check for breathing and a pulse
B. Shake and shout, check unresponsiveness
C. Begin compressions at 30:2
D. Assure the area is safe for you to be in

22. After performing the choking procedure for a conscious victim who becomes unconscious, the next procedure is to?

A. Perform a finger sweep
B. Attempt ventilations
C. Straddle the victim
D. Begin CPR compressions

23. High quality CPR is the critical component to resuscitation, especially compressions; which concept is correct?

A. Compression depth has a higher priority than recoil or relaxation
B. Compression and recoil (refill) are equally important
C. Ventilation is the priority for all victims
D. 35 ventilations per minute are optimum for the best outcome

24. When performing compressions on a child for CPR or unconscious foreign body airway procedures the proper depth is?

A. ½" or ½ the depth of the chest
B. 1 ½ " to 2 1 ½ " inches
C. Varies based on age and weight
D. 2" or 1/3 the depth of the chest

25. While at a school event, a teacher chokes on gum. He runs towards the office before falling unconscious. Immediately after performing 30 compressions, the next step is?

A. Open the airway and look into the mouth before ventilating
B. Perform a finger sweep and attempt breaths
C. Readjust the airway with a jaw thrust maneuver
D. Check pulse for no more than 10 seconds

26. The resuscitation team is made up of various professionals with different levels of license and skill sets. In order to function efficiently the team members must?

A. Wait for a physician to order CPR and defibrillation
B. Always be prepared to perform any skills, even if not licensed to
C. Realize their strengths, abilities and limitations
D. Decide if they feel CPR is worth the physical effort

27. A victim begins to choke, and you find them grabbing their throat and coughing uncontrollably, you should?

A. Perform the Heimlich maneuver
B. Perform the modified Heimlich maneuver
C. Perform chest thrust if they are pregnant or obese
D. Allow them to continue coughing

28. You are assisting with a cardiac arrest at a surgi- center. Someone brings in an AED that you are not familiar with, in relation to utilizing this:

A. Have an overhead page put out for someone familiar with the unit
B. Perform 2 minutes of CPR, then apply the pads
C. Wait for EMS or someone familiar with the AED before using
D. Turn on the unit and follow the directions

29. The accepted ratio of compressions to ventilations for a 6-year-old drowning victim when only 1 rescuer is available is?

A. 15:1
B. 30:1
C. 30:2
D. 15:2

30. AED Pads require firm contact to the skin to be most effective, which of the following will negatively affect that contact?

A. Water on the patient's chest
B. Suntan oil on the skin
C. Hair on the chest
D. All of the above

NAME: _____

COURSE: **Mandatory** Pre Test Questions for those completing BLS after ACLS or PALS

# MISSED: _____ GRADE: _____

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D
16. A B C D
17. A B C D
18. A B C D
19. A B C D
20. A B C D
21. A B C D
22. A B C D
23. A B C D
24. A B C D
25. A B C D
26. A B C D
27. A B C D
28. A B C D
29. A B C D
30. A B C D

**REMINDER:**

**You must score an 84% to be eligible for the BLS Completion section after ACLS or PALS**