



Maryland Medical Protocols For EMS Providers



Protocol Update
Effective July 1, 2005

Additional Information

For additional information regarding the content of this presentation or the Maryland Medical Protocols for EMS Providers contact:

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Continuing Education Credit

The 2-hour 2005 Protocol Rollout is approved for the following:

Program # 25191

ALS Category 2 2 hours

BLS Category L 2 hours

Pocket Protocols

A new pocket protocol version will be available June 1st.

To obtain pocket protocols, contact the Office of Licensure and Certification:

(410) 706-3666

Edits

- The effective date throughout the protocols was changed to July 1, 2005.
- Page iii
 - A new letter to the EMS providers was inserted.
- Pages v-x
 - The Table of Contents was reformatted to include the new material and reflect the change in page numbers.

Edits

- The acronym for subcutaneous was changed from SQ to SC.
- All “trailing zeros” were eliminated from medication doses in an effort to reduce medication errors.
 - For example 1.0 mg/kg now reads 1 mg/kg.

General Patient Care: Circulation

Page 27 Line 4.a)(1)(a),(ii) & (b)

- For an infant and child (less than 1 year of age):
Heart rate criteria for when to begin CPR has been changed from 80 bpm to 60 bpm.

General Patient Care: Circulation

Page 27 Line 4.a)(2)

- The reference has been changed to match American Heart Association guidelines
- Symptomatic infant with poor perfusion with pulse less than 60 bpm, Ventilate for 30 seconds:
 - Pulse remains less than 60 bpm – begin CPR
 - Pulse greater than 60 bpm – continue assessment

General Patient Care: Circulation

Page 27 Line 4.a)(2)

The American Heart Association defines CPR for infants and children as follows:

Infants: Less than 1 year

Children: 1- 8 years of age

General Patient Care: Circulation

Page 28 Line (3)

- The reference to the age for AED use was lowered. An AED may be used on a patient greater than 1 year of age if it is a pediatric AED or has the appropriate pads for the pediatric patient.

Page 28 Line (3)

- The order of text was changed. If an AED is available, it should be used prior to initiating CPR.



General Patient Care: History and Physical Exam

Page 31 Line 2

- A reference was added to prompt the provider to seek and collect emergency information forms.

Examples include:

- DNR Forms, Medic Alert Forms, form developed by jurisdiction, or Emergency Information Form.

The image shows a form titled "Maryland Emergency Medical Services (EMS) Do Not Resuscitate (DNR) and Medical Care Order". The form includes sections for "Patient Identifying Information", "Physician's Order", "Maximum Efforts to Prevent Cardiorespiratory Arrest", "Supportive Care Prior to Cardiorespiratory Arrest", and "Physician's Certification". It also has a section for "Physician's Signature and Identifying Information". The form is designed to be filled out by a physician to provide instructions to EMS personnel regarding resuscitation efforts.



Emergency Information Form: Developed for Children with Special Health Care Needs

Emergency Information Form for Children With Special Needs



Date form completed By Whom Revised Revised Initials Initials

Last name:

Name:		Birth date:	Nickname:
Home Address:		Home/Work Phone:	
Parent/Guardian:	Emergency Contact Names & Relationship:		
Signature/Consent*:			
Primary Language:	Phone Number(s):		
Physicians:			
Primary care physician:	Emergency Phone:		
	Fax:		
Current Specialty physician: Specialty:	Emergency Phone:		
	Fax:		
Current Specialty physician: Specialty:	Emergency Phone:		
	Fax:		
Anticipated Primary ED:	Pharmacy:		
Anticipated Tertiary Care Center:			

Diagnoses/Past Procedures/Physical Exam:	
1.	Baseline physical findings:
2.	
3.	Baseline vital signs:
4.	
Synopsis:	
	Baseline neurological status:

Diagnoses/Past Procedures/Physical Exam continued:	
Medications:	Significant baseline ancillary findings (lab, x-ray, ECG):
1.	
2.	
3.	
4.	Prostheses/Appliances/Advanced Technology Devices:
5.	
6.	

Last name:

Management Data:	
Allergies: Medications/Foods to be avoided	and why:
1.	
2.	
3.	
Procedures to be avoided	and why:
1.	
2.	
3.	

Immunizations									
Dates						Dates			
DPT						Hep B			
OPV						Varicella			
MMR						TB status			
HIB						Other			

Antibiotic prophylaxis: Indication: Medication and dose:

Common Presenting Problems/Findings With Specific Suggested Managements		
Problem	Suggested Diagnostic Studies	Treatment Considerations

Comments on child, family, or other specific medical issues:	
Physician/Provider Signature:	Print Name:

General Patient Care

Page 33 ALERT

- “All requests For Scene Helicopter Transports Shall Be Made Through SYSCOM” was added.

Page 33 Line (3)

- The reference to head injury was removed since no specific head injury protocol was developed.

Information to SYSCOM

- In 2004, 1.2.d) “Refer to the trauma decision tree when considering use of aeromedical transport. Provide SYSCOM with the patient’s category (A, B, C, or D)”
 - Provide the Trauma Decision Tree category (A, B, C, or D) This category determination will influence the use of commercial aeromedical assets in the event a MSP medevac unit is not readily available.

Physiologic Abnormalities and Several Significant Anatomical Injuries Require Emergent Transport: Category A

- GCS less than 8 *or*
- Systolic BP
Less than 90
(Adult),
Less than 60
(Peds) *or*
- Respiratory rate
Less than 10 *or*
greater than 29
- Flail chest
- Penetrating injuries to head, neck, or torso
- Pelvic fracture
- Two or more proximal long-bone fractures
- Rapidly declining GCS

Anatomic Injuries -- Urgent Category B

- Amputation proximal to wrist and ankle
- Limb paralysis
- Combination trauma with burns
- Penetrating injuries to extremities proximal to elbow and knee
- GCS 8-14

Mode of Transportation

- Page 33 I.2.c) "If time of arrival at the trauma or specialty referral center via ground unit is less than 30 minutes, there will generally not be a benefit in using the helicopter, especially for Trauma Decision Tree classes C and D."
- This does not mean take the patient to the local ED. The patient still meets criteria to be transported to a Trauma or Specialty Center.
- If the helicopters are not flying, it is reasonable to transport the patient by ground up to an hour to get him/her to a Trauma Center or Specialty Center.

Mechanism of Injury & High-Energy Impact Category C

- Ejection from automobile
- Falls greater than 3 times patient's height
- Death in same passenger compartment
- Vehicle rollover
- Extrication time greater than 20 minutes
- High-speed auto crash
 - Initial speed greater than 40 mph
 - Major auto deformity greater than 20 inches
 - Intrusion into passenger compartment greater than 12 inches

Mechanism of Injury & High-Energy Impact Category C

- Auto-pedestrian/auto-bicycle injury with significant (greater than 5 mph) impact
- Pedestrian thrown or run over
- Motorcycle crash greater than 20 mph or with separation of rider from motorcycle
- Exposure to blast or explosion

Co-Morbid Factors Category D

- Probably the most misunderstood section of the protocols
- These are processes, medications, or diseases that lead to patients having minimal injury or mechanisms; yet due to these factors the patients go on to have serious complications from their “minor” trauma.
- This means that patients with a cause of injury that does not meet Category C but who have a Category D Co-Morbid factor should be transported to a trauma center for evaluation because they have higher complications from minor injury, are harder to assess, and may need surgical intervention to manage their injuries.

Co-Morbid Factors Category D

- Age less than 5 or greater 55
- Pregnancy
- Cardiac disease, respiratory disease
- Immunosuppressed patients
- Insulin-dependent diabetes, cirrhosis, or morbid obesity
- Patient with bleeding disorder or patient on anticoagulants

Co-Morbid Factors Category D

- Example:

A 72-year-old male falls from a step ladder that is only 6 feet high (less than 3 times his height). Patient is complaining of an ache across his mid-back. Vs HR 90 BP 130/80 and RR 18, clear lung sounds. ECG NSR

Should this patient go to Trauma Center and what Category?

Age Is a Destination Influence

- It is important to understand the reason for this inclusion of the Senior or Elderly patient.
 - Cardiac and vascular compensation mechanisms are diminished.
 - Is more stoic and does not complain as much as a younger patient with the same injury
 - Often is on medications that blunt vital sign changes, so may not manifest physiologic signs until he/she crashes
 - Organs are more susceptible to traumatic injury (bones more brittle, vessels more rigid, etc).

This Patient Is Clearly A Category D

- Think of this patient as “almost a Category C” but since he/she has a Category D risk factor, he/she should go to a Trauma Center.
- This patient was left at home by EMS and later started urinating frank blood and became shocky 6 hours later. Family drove the patient to the local ED and the patient was later transferred to a Trauma Center.

Altered Mental Status: Seizures

Pages 37 & 38 Lines e) & I)

- A reference to allow the IM administration of Valium was added.
- IM administration requires medical direction.
- A reference for severe nerve agent exposure has also been added.
- If severe nerve agent exposure is suspected, providers may administer diazepam without medical consultation.

Altered Mental Status: Seizures

Page 38 Line 1)

- The rectal dose of valium for a child has been lowered. The new dose is:
 - Up to 0.2 mg/kg rectal, Maximum total dose 10 mg.

Altered Mental Status: Unresponsive Person

Pages 39 & 40; Lines e) & m)

- Intranasal was added to the list of possible administration routes for Narcan.

Page 40 Line k)(1)

- The term “fluid challenge” was changed to “fluid bolus” and a reference was added for Volume Sensitive Children.



Volume Sensitive Children

Page 40 Line k)(1)

- Definition: children that need smaller fluid bolus volumes due to special needs including:
 - neonates (birth to 28 days)
 - congenital heart diseases
 - chronic lung disease
 - chronic renal failure
- Fluid bolus for volume sensitive children is 10 ml/kg of LR.

Volume Sensitive Children

- Volume sensitive fluid bolus included in:
 - Altered mental status protocol
 - Cardiac emergency protocols
 - Hypoperfusion protocol
- All trauma patients regardless of past medical history receive 20 ml/kg.



Apparent Life Threatening Event (ALTE)

Pages 41 & 42

- This is a new protocol specific to the pediatric patient.

Apparent Life Threatening Event: “What It’s Not....”

- *It's not* a new term (it was defined in 1986)!
- *It's not* a diagnosis, but a symptom complex.
- *It's not* to be confused with SIDS (see definition).
- *It's not* ever to be “blown-off” or underestimated; an ALTE must always result in a transport. Utilize your pediatric base station physician if necessary.

ALTE: NIH Consensus Definition 1986

- An episode that is frightening to the observer and that is characterized by some combination of apnea (central or occasionally obstructive), color change (usually cyanotic or pallid but occasionally erythematous or plethoric), marked change in muscle tone (usually marked limpness), choking, or gagging. In some cases, the observer fears that the infant has died. Previously used terminology such as “aborted crib death” or “near-miss SIDS” should be abandoned because it implies a possibly misleading association between this type of spell and SIDS.

ALTE - A Symptom Complex: Etiologies

- Gastroesophageal reflux
- Pertussis
- Respiratory Syncytial Virus
- Urinary Tract Infection
- Metabolic Disorders
- Cerebral Lesions
- Cardiac Dysrhythmias
- Anemia
- Primary Prolonged Apnea
- Obstructive Sleep Apnea
- Medication or Drug Effects
- Sepsis
- Dehydration
- Small Airway Patency issues
- Tracheal/Pharyngeal problems
- Facial Dysmorphism
- Child Abuse
- Factitious Caregiver Complaints

ALTE and EMS: Recent Evidence

(In Case You Still Need Convincing)

- The incidence of ALTE was found to be 7.5% in an out-of-hospital infant population.
- The overwhelming majority of ALTE patients (83%) appeared to be in no apparent distress by EMS assessment.
- Nearly half of the patients assessed by EMS to be in no apparent distress (48%) were later found to have significant illnesses upon ED evaluation.

Stratton S, et al. Apparent Life-Threatening Events in Infants: High Risk in the Out-of-Hospital Environment. *Annals of Emergency Medicine*, 2004;43:711-717

ALTE Protocol: Application of the Pediatric Assessment Triangle

PAT



- No distress – well appearing without signs or symptoms of illness
- Mild – ill appearing but without signs or symptoms of life-threatening illness
- Moderate – signs or symptoms of possible life-threatening illness but with stable vital signs
- Severe – Definite life-threatening symptoms, injuries, or abnormal vital signs

ALTE: The Bottom Line

- The history of an apparent life-threatening event (ALTE) must always result in transport to an emergency department regardless of the infant's appearance at the time of EMS assessment.

Universal Algorithm for Adult Emergency Cardiac Care for ALS & BLS

Page 46

- The order of text was changed. If an AED is available, it should be used prior to initiating CPR.

Page 47

- "Arrhythmia" was changed to "Dysrhythmia."

Universal Algorithm for Pediatric Emergency Cardiac Care for BLS

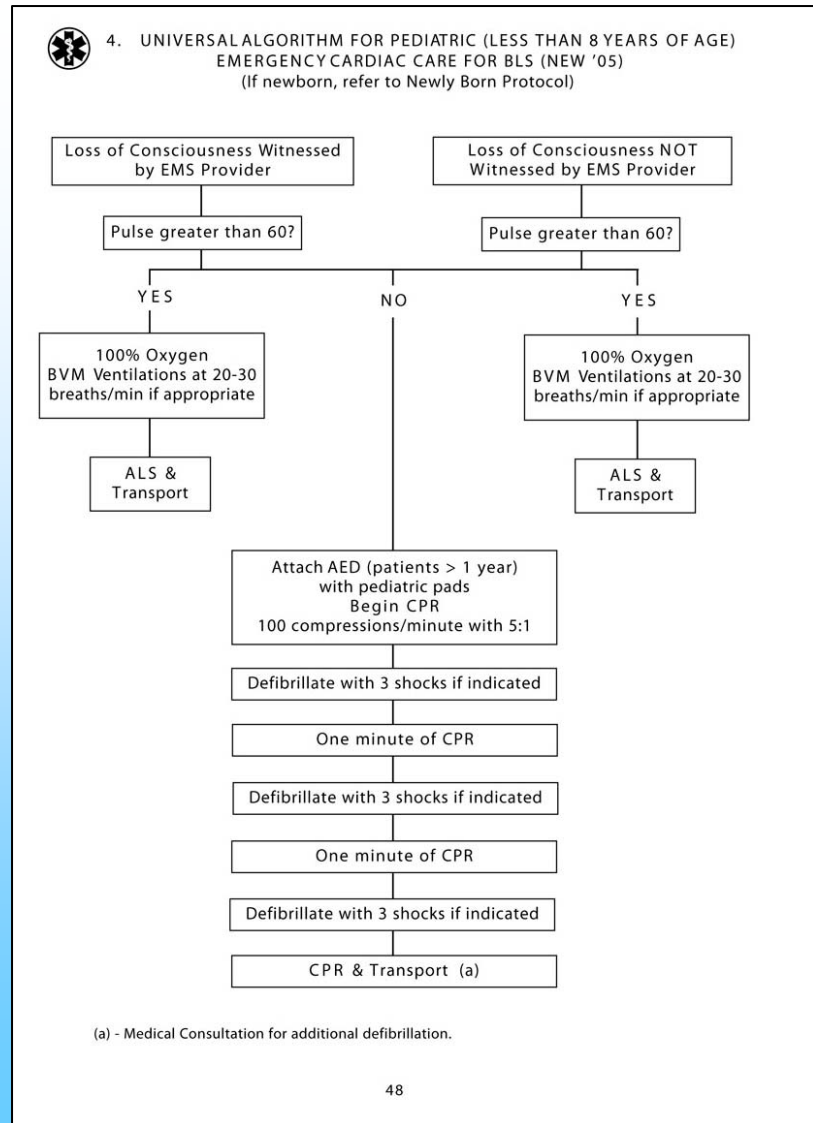
Page 48

- An algorithm for BLS Emergency Cardiac Care of pediatric patients was developed.

Universal Algorithm For Pediatric Emergency Cardiac Care for BLS

Page 48

- A universal BLS algorithm for pediatric patients less than 8 years of age was added.
- If patient is a newborn, go to Newly Born Protocol.



Universal Algorithm for Pediatric Emergency Cardiac Care for ALS

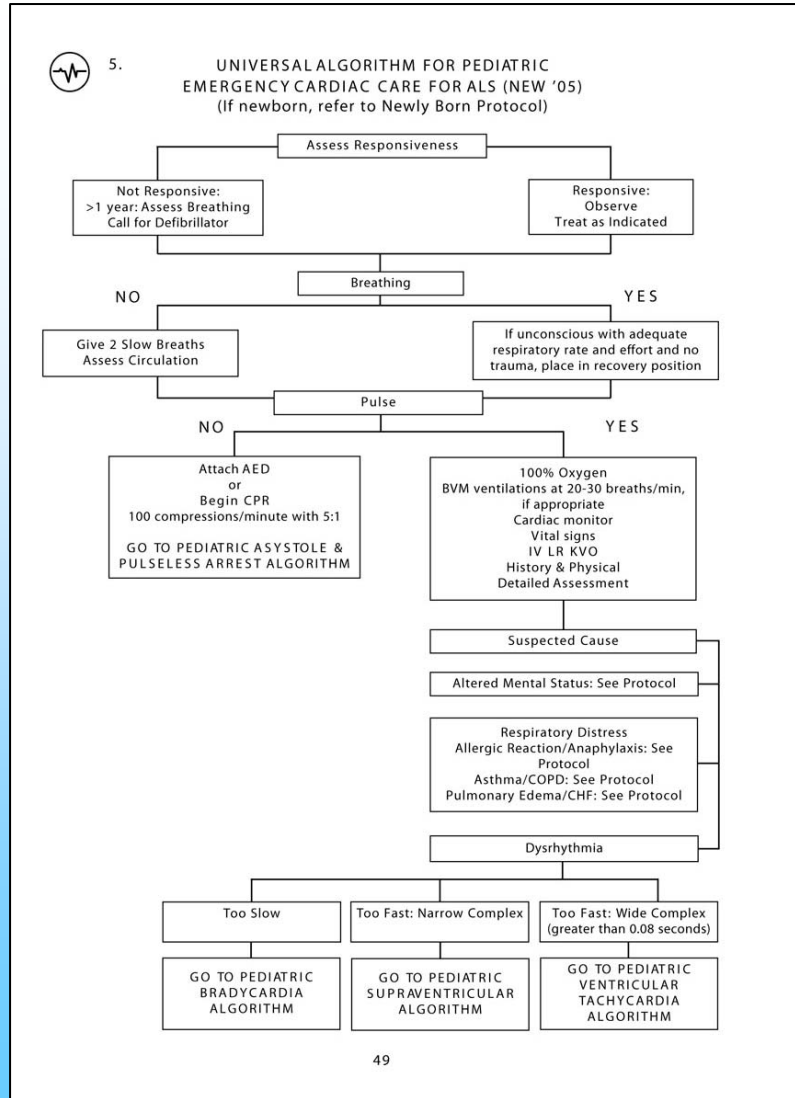
Page 49

- An algorithm for ALS Emergency Cardiac Care of pediatric patients was developed.

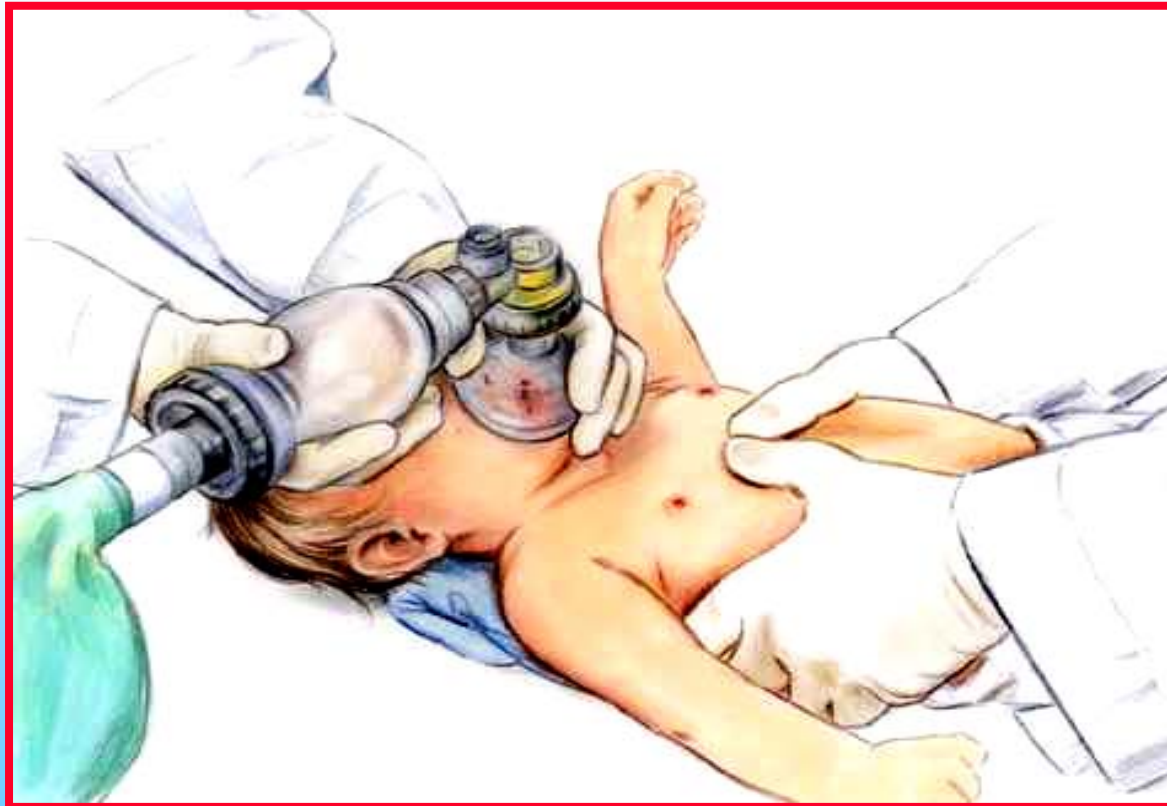
Universal Algorithm For Pediatric Emergency Cardiac Care for ALS

Page 49

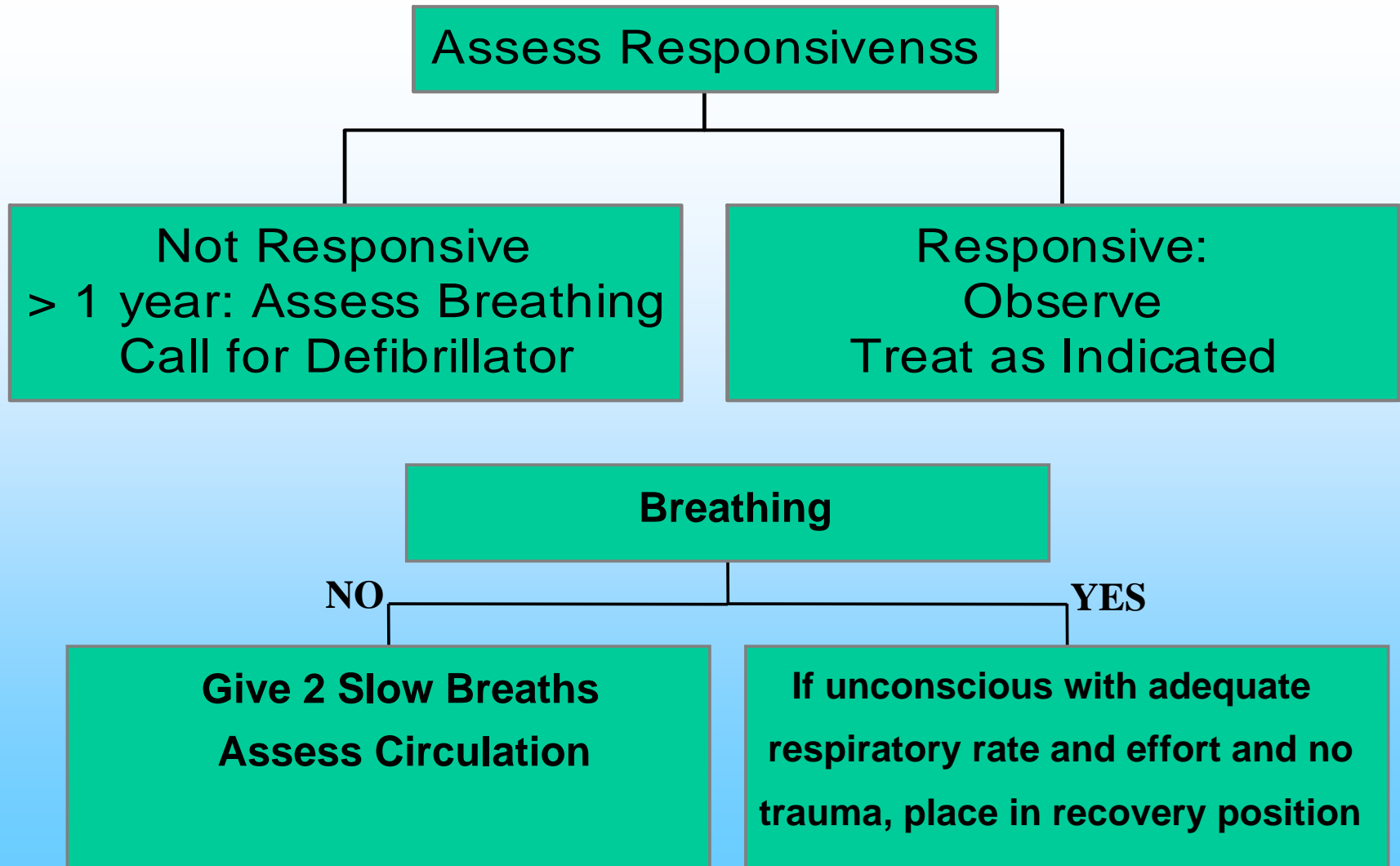
- A universal ALS algorithm for pediatric patients less than 8 years of age was added.
- If patient is a newborn, go to Newly Born Protocol.



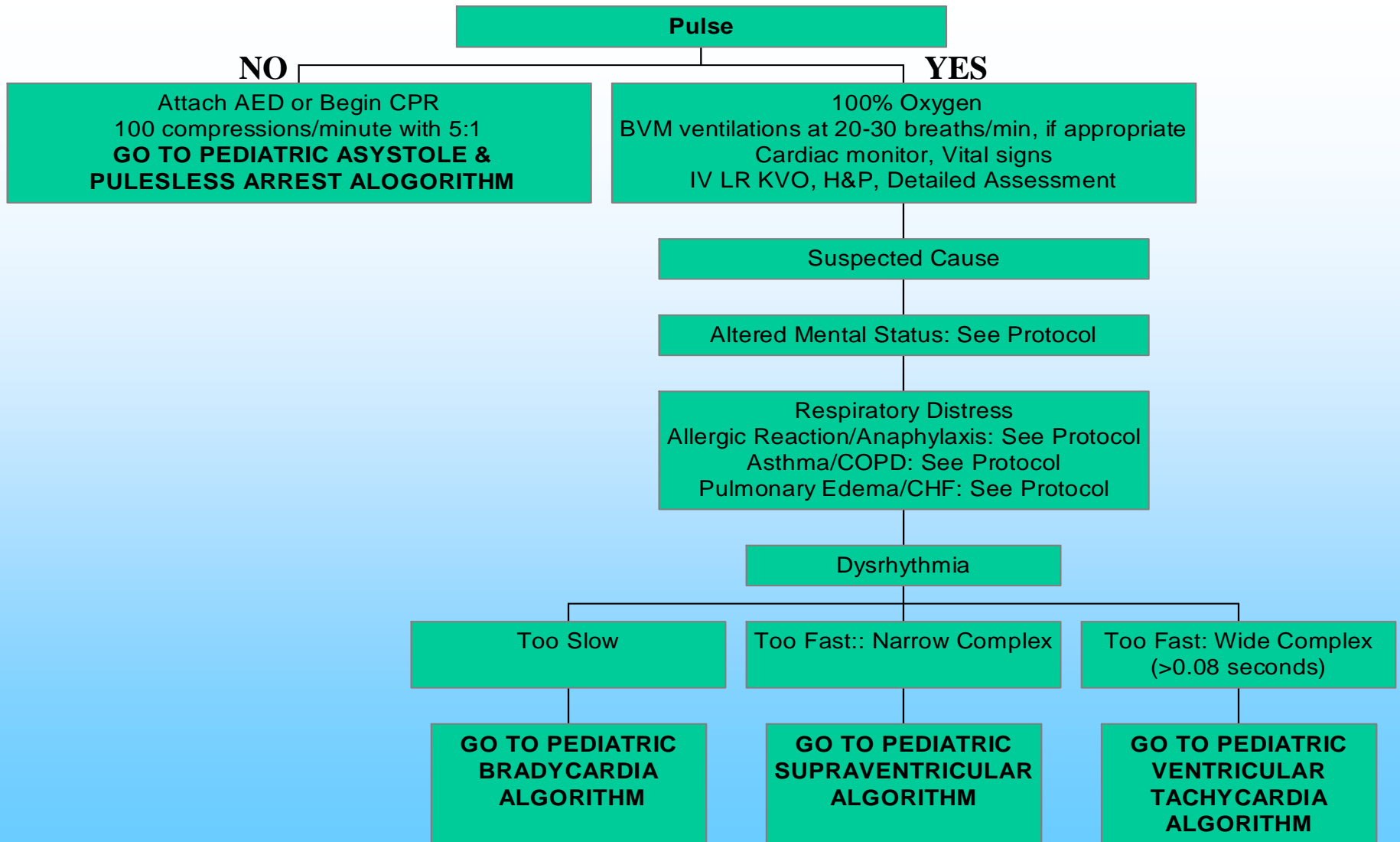
Two Thumb–Encircling Hands Technique Preferred for Infant 2-Rescuer CPR by HCP



Universal Algorithm for Pediatric Emergency Cardiac Care for ALS



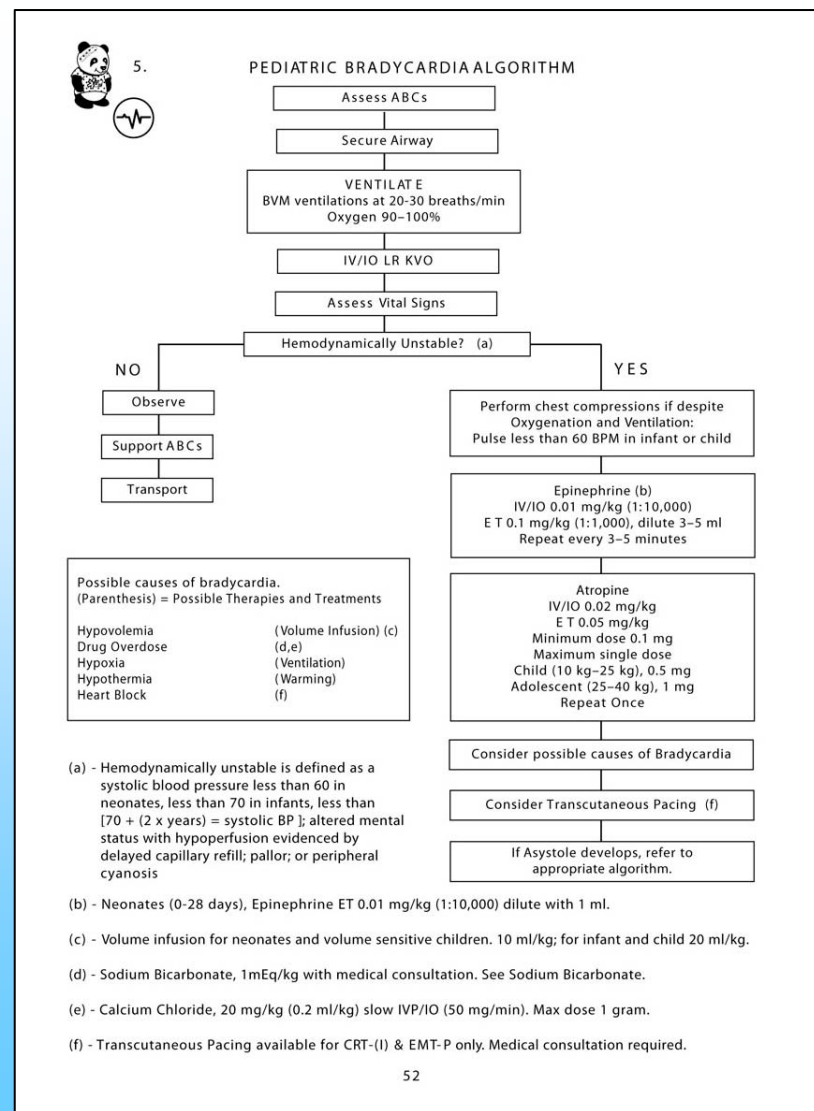
Universal Algorithm for Pediatric Emergency Cardiac Care for ALS



Pediatric Bradycardia Algorithm

Page 52

- A specific rate was added to the ventilation box: "BVM ventilations at 20-30 breaths/min".
- The pulse rate for the infant and child was standardized to "60 bpm".
- Possible causes of Bradycardia were added to the algorithm.



Pediatric Bradycardia Algorithm

Assess ABCs

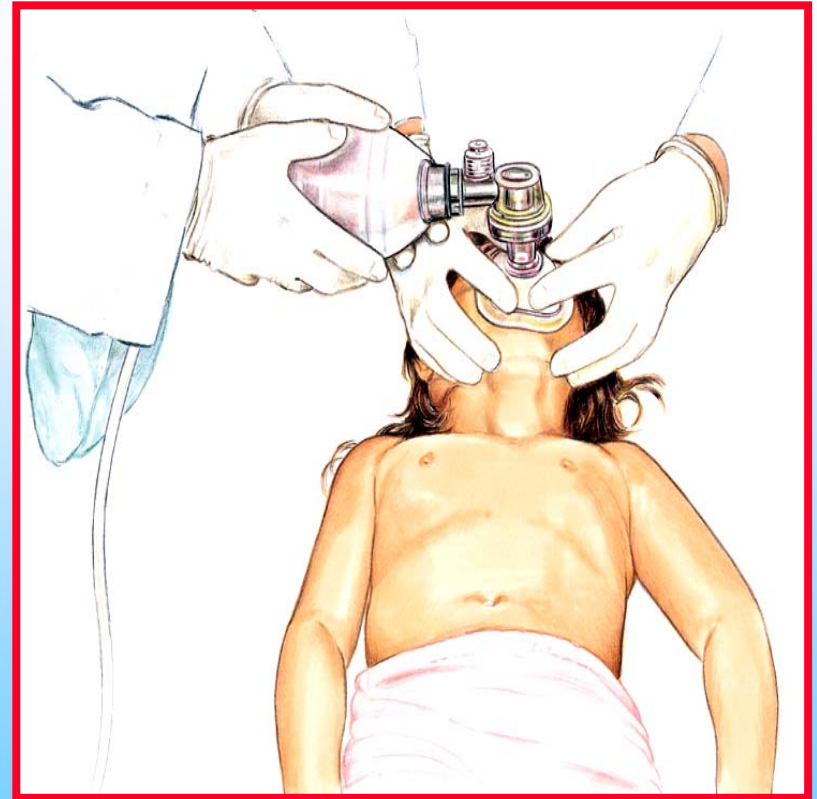
Secure Airway

Ventilate

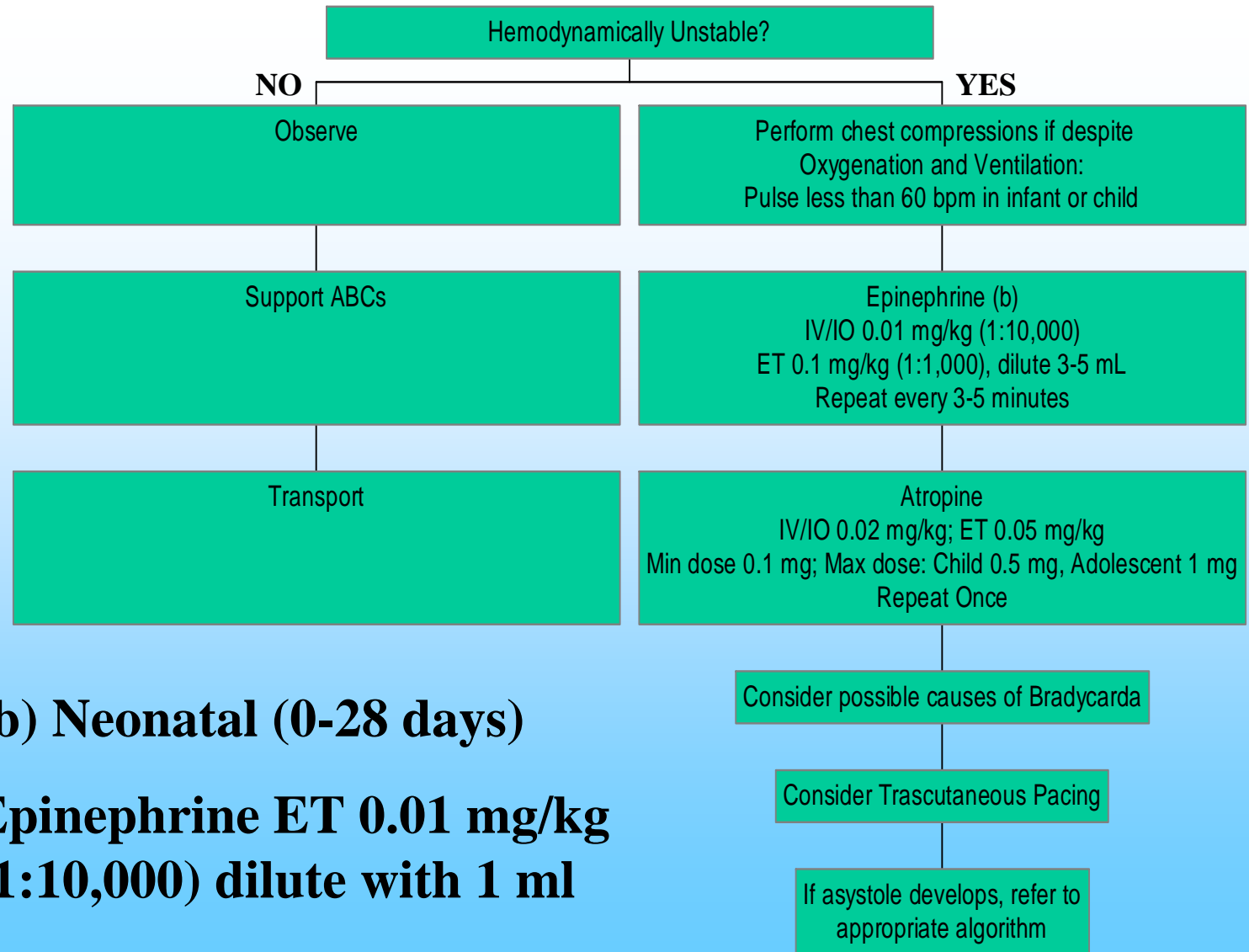
BVM ventilations at 20-30 breaths/ min
Oxygen 90 - 100%

IV/IO LR KVO

Assess Vital Signs



Pediatric Bradycardia Algorithm



(b) Neonatal (0-28 days)

**Epinephrine ET 0.01 mg/kg
(1:10,000) dilute with 1 ml**

Pediatric Bradycardia Algorithm

Possible causes of bradycardia
(Parenthesis) = Possible Therapies and Treatments

Hypovolemia

Volume infusion for Neonate and volume sensitive children = 10 mL/kg
For infant and child = 20 mL/kg

Drug Overdose

Sodium Bicarbonate: 1 mEq/kg with medical consultation
Calcium Chloride: 20 mg/kg (0.2 mL/kg) slow IVP/IO (50 mg/min)
Max dose 1 gram

Hypoxia

Ventilation

Hypothermia

Warming

Heart Block

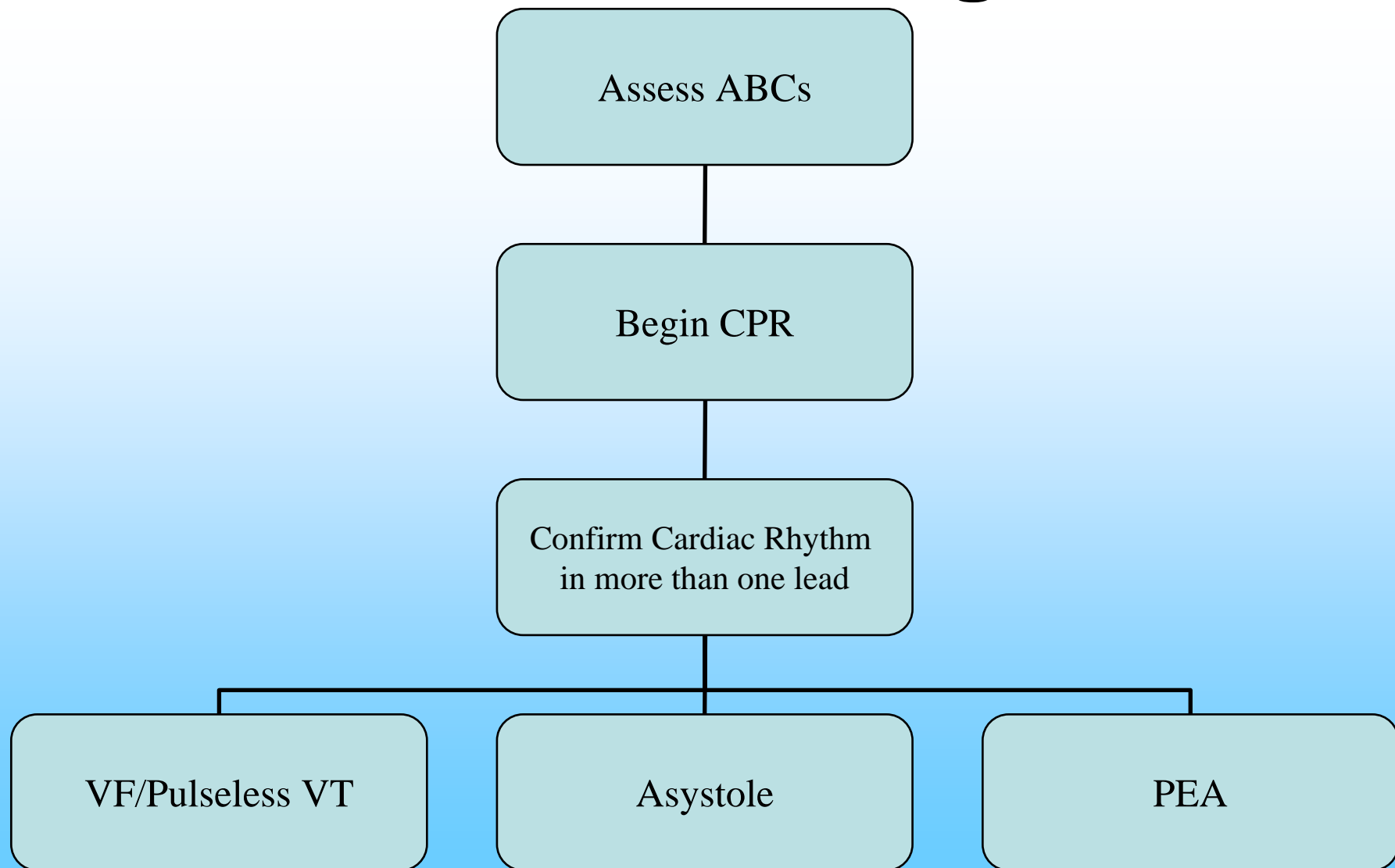
Consider Transcutaneous Pacing
For CRT-(I) & EMT-P only
Medical consultation required

Pediatric Asystole & Pulseless Arrest Algorithm

Page 55

- Revised epinephrine dose
 - All doses IV/IO
 - 0.01 mg/kg 1:10,000 (0.1 ml/kg)
 - ET administration
 - 0.1 mg/kg 1:1,000 (0.1 ml/kg)
 - Dilute in 3-5 ml of LR
 - Neonates (0-28 days) 0.01 mg/kg 1:10,000 dilute with 1 ml
 - Repeat every 3-5 minutes

Pediatric Asystole and Pulseless Arrest Algorithm





Pediatric Asystole and Pulseless Arrest Algorithm

Page 55

- Atropine is not indicated for the pediatric patient in asystole.
- The footnotes were modified to include the appropriate dosing and volume for neonates.



Potentially Reversible Causes of Arrest: 4 H's

- Hypovolemia
- Hypoxia
- Hypothermia
- Hyper/hypokalemia and metabolic causes (eg, hypoglycemia)



Potentially Reversible Causes of Arrest: 4 T's

- Tamponade (cardiac tamponade)
- Tension pneumothorax
- Thromboembolism (pulmonary)
- Toxins/poisons/drugs

Cardiac Emergencies: Chest Pain

Page 58

- The ALERT has been revised.
 - Nitroglycerin is contraindicated for any patient who has taken a medication for erectile dysfunction (Viagra, Cialis, or Levitra) in the past 48 hours. Previously it was only contraindicated for 24 hours.

Cardiac Emergencies: Chest Pain

Page 59 Line I)

- “Paramedic may perform without consult” was removed from the administration of morphine sulfate.
- For patients complaining of chest pain, a provider must consult prior to administering morphine.
- This was an error in the 2004 edition.

Cardiac Emergencies: Hyperkalemia

Page 61 Line m)

- A maximum dose for calcium chloride was added.
 - "Maximum dose 1 gram or 10 ml."



Newly Born Protocol

Pages 62-64

- The following (BLS & ALS) protocols have been replaced by the Newly Born Protocol
 - Newborn Resuscitation Birth to 28 Days Old
 - Newborn Resuscitation: Bradycardia Protocols

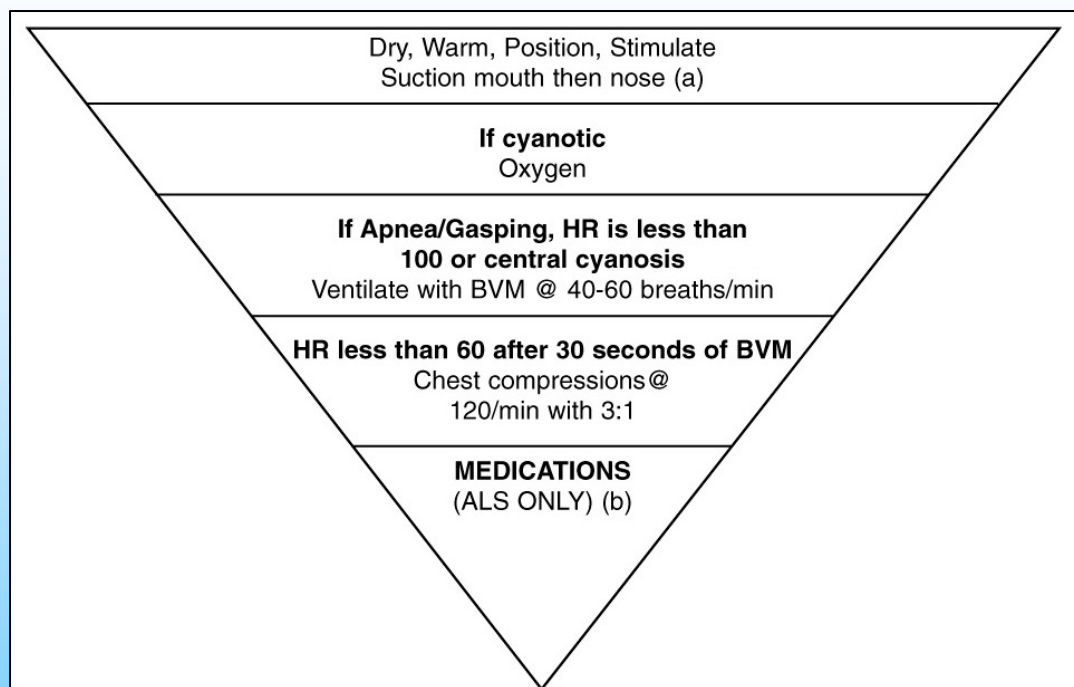
Newly Born is defined as the “infant who is just delivered.”

Neonate is defined as infant up to 28 days and guidelines have been incorporated into Pediatric protocols.

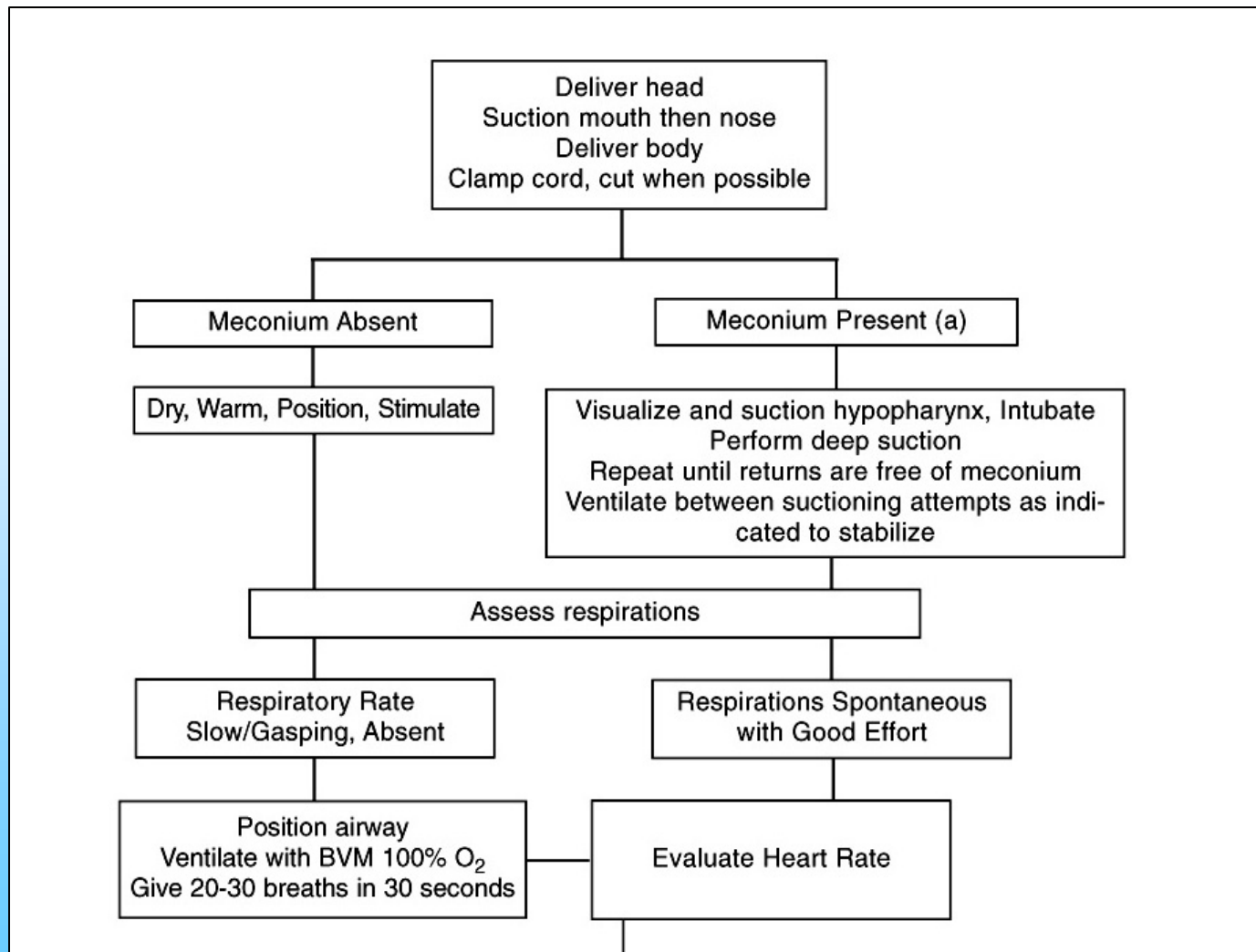
Universal Algorithm for the Newly Born - BLS

The Newly Born Protocol is based on the Inverted Pyramid developed by the American Academy of Pediatrics.

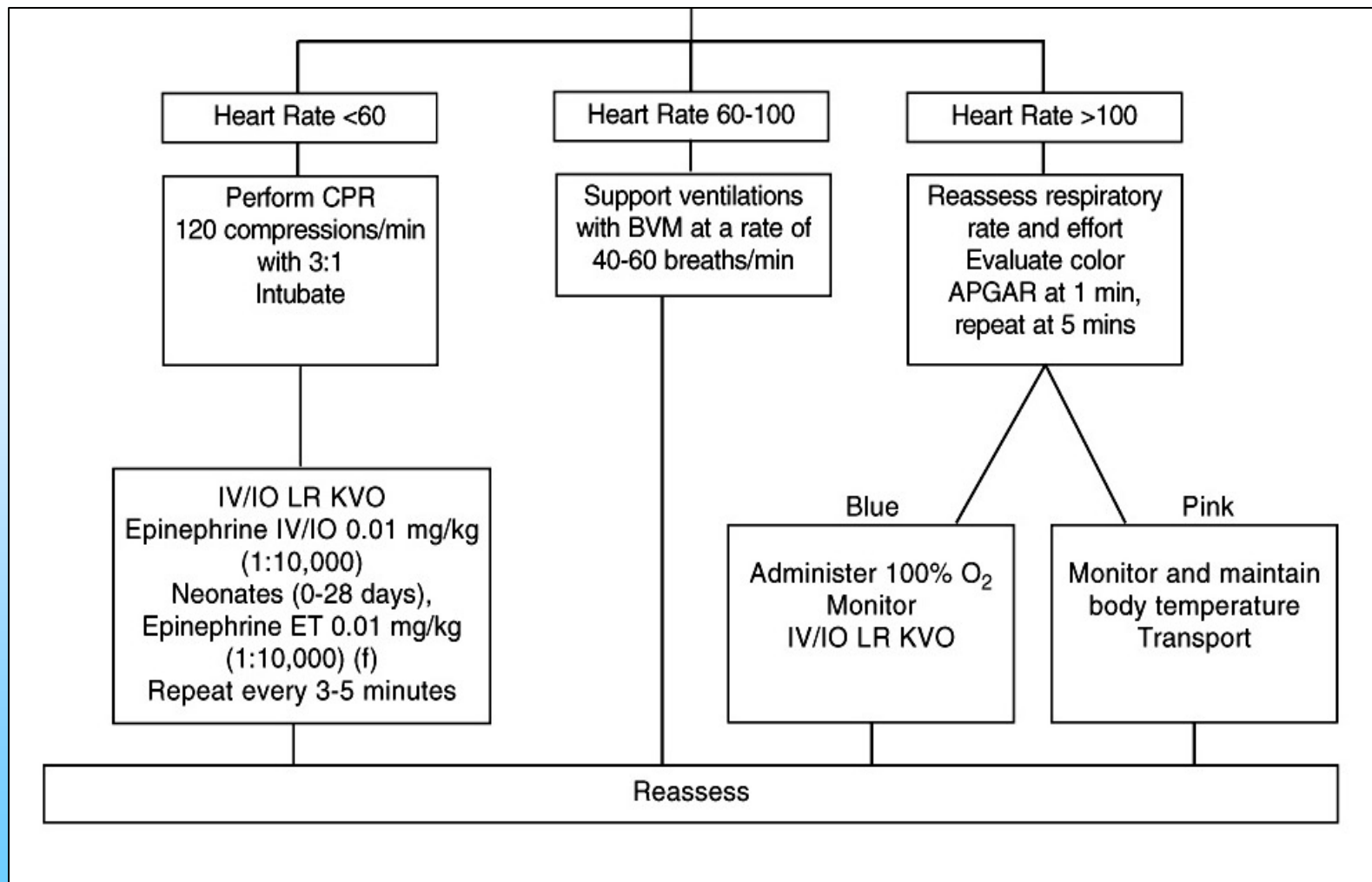
Universal Algorithm for the Newly Born for BLS



Universal Algorithm for the Newly Born - ALS



Universal Algorithm for the Newly Born -ALS (cont')



Universal Algorithm for the Newly Born for ALS (cont')

Consider possible causes of depressed newborn.
(Parenthesis) = Possible Therapies and Treatments

Respiratory depression	(b,c)
Hypoglycemia	(d)
Hypothermia	(Warming)
Hypovolemia	Volume Infusion (e)

- (a) - Deep tracheal suctioning with meconium aspirator is only indicated for infants with thick (pea soup-like) meconium or respiratory depression after initial resuscitation.
- (b) - Premature infants less than 32 weeks gestation will likely require ongoing BVM ventilations due to immature lungs.
- (c) - Naloxone 0.1 mg/kg ET/IV/IO.
- (d) - D10W 5 -10 ml/kg IV/IO (D10W is prepared by mixing one part of D50W with four parts LR).
- (e) - Volume infusion is 10ml/kg.
- (f) - Neonates (0-28 days), Epinephrine ET 0.01 mg/kg (1:10,000) dilute with 1 ml.

Sudden Infant Death Syndrome (SIDS)

Page 68

- An ALERT was added.
 - “Rigor Mortis May Be Present (See Presumed Dead on Arrival Protocol)”.
- “Dependent lividity” was removed as a criteria from the Presumed Dead on Arrival Protocol.
- “If indicated” was added to the treatments section (line a) section.

Environmental Emergencies: Cold Emergencies (Frostbite)

Page 76 Line 1)

- The dosage and routes for the administration of morphine to pediatric patients have been standardized.
- Pediatric Dose of Morphine Sulfate
 - Consider Morphine Sulfate
0.1 mg/kg slow IV/IM/IO
Administer 1-2 mg/min
Maximum dose 5 mg

Hyperbaric Therapy Protocol

Page 85 Line 3.a)

- Specific signs and symptoms were added.
- A patient should be considered for hyperbaric therapy if he/she had a loss of consciousness, nausea, vomiting, diarrhea, altered mental status, abnormal skin color, dyspnea, or seizures secondary to suspected carbon monoxide exposure and may or may not have minor burns.

Hyperbaric Therapy Protocol

Page 85 Line 3.b)

- The reference to airway thermal injuries was removed.

Hypertensive Crisis

- This protocol has been deleted.
- A patient experiencing hypertension should be treated according to General Patient Care Guidelines.

Non-Traumatic Shock: Hypoperfusion

Page 88

- Criteria for Hypotension revised
 - Systolic blood pressure less than 60 in neonates
 - Less than 70 in infants
 - Less than $[70 + (2 \times \text{years})]$ for children
- Fluid bolus is 20 ml/kg LR IV/IO
 - Reassess and repeat second bolus if condition does not improve.
- Volume sensitive children receive an initial fluid bolus of 10 ml/kg LR IV/IO
 - Reassess and repeat second bolus of 10 mL/kg if condition does not improve.

Volume sensitive children include: neonates (birth to 28 days), congenital heart diseases, chronic lung disease, chronic renal failure

Obstetrical/Gynecological Emergencies: Childbirth Algorithm

Page 90

- The reference was changed to “GO TO NEWLY BORN PROTOCOL” since this protocol replaces Newborn Resuscitation.

Overdose / Poisoning: Ingestion

Pages 94-95

- The administration of syrup of ipecac was deleted from this protocol.
- Activated charcoal should only be administered without Sorbitol.

Overdose / Poisoning: Ingestion

The Demise of Ipecac

Syrup of Ipecac has been eliminated from both the EMS protocols and the PEMAC recommendations for the VAIP standards

- Research studies have demonstrated no improvement in outcome when Ipecac is used.
- Charcoal *without Sorbitol* has been found to be effective in treating specific overdoses.



Overdose / Poisoning: Ingestion

Demise of Ipecac: The Bottom Line Evidence

- Inefficacious in preventing gastrointestinal absorption
- May interfere with more effective gastric-emptying therapies, i.e. activated charcoal
- Routinely improperly administered by caregivers

Overdose / Poisoning: Ingestion

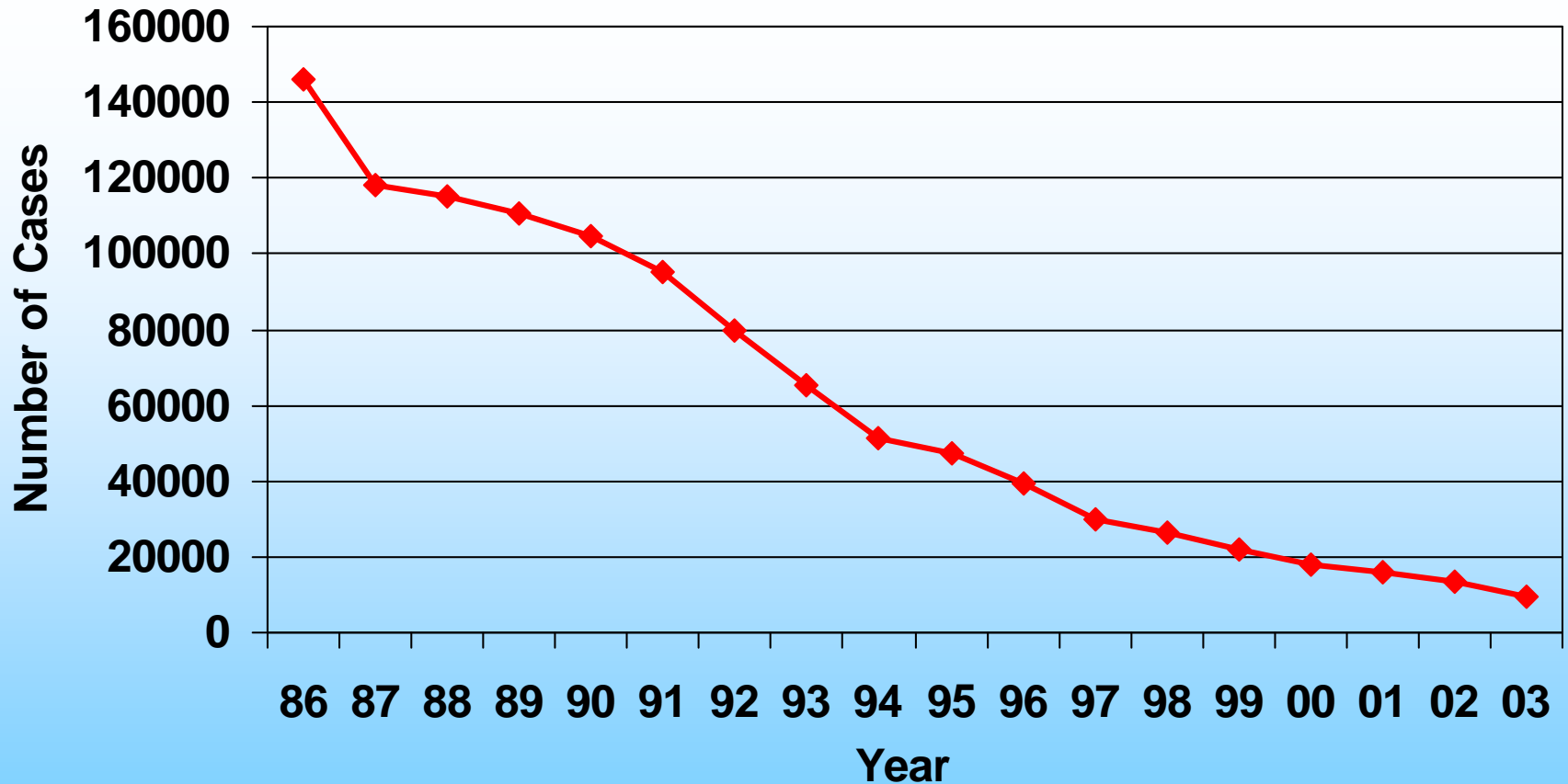
Demise of Ipecac:

The Bottom Line Evidence

- Small, but not insignificant, incidence of abuse:
 - Eating disorders
 - Munchausen's by proxy
- Primary Prevention: The elimination of potentially harmful products from the marketplace has been the key effective strategy.



Use of Ipecac Syrup by US Poison Centers



Current Maryland Poison Center Recommendations?

- Prehospital use of ipecac is not recommended
- Activated charcoal *without sorbitol* should be given by EMS if:
 - Patient is awake and alert;
 - Significant toxicity is likely;
 - The substance binds to Activated Charcoal;
 - Recent time of ingestion;
 - There are no contraindications;
 - Medical Direction has been contacted;
 - Poison Center has been consulted.



Overdose / Poisoning: Ingestion

Activated Charcoal *without Sorbitol*

Dose – 1 gram /kg PO

Route – Oral

Orders – from online
medical control

Information –

Maryland Poison Center
1-800-222-1212 or EMRC



Overdose / Poisoning: Inhalation

Page 97

- A reference was added to the ALERT for toxic exposure. It now reads:
 - Patients With Suspected Carbon Monoxide Or Toxic Inhalation Without Major Burns Should Be Considered For Transport To The Hyperbaric Specialty Center. Patients In Closed Space Incidents Are More Likely To Experience Carbon Monoxide With Altered Mental Status.

Overdose / Poisoning: Injection

Page 100

PASG – deleted for children

PASG have been deleted for all indications in the pediatric sections of the protocols.

- *In children, PASG may cause respiratory compromise and they are not associated with improved outcomes*
- *Pediatric trauma centers have not given medical direction for use of PASG in past three years.*



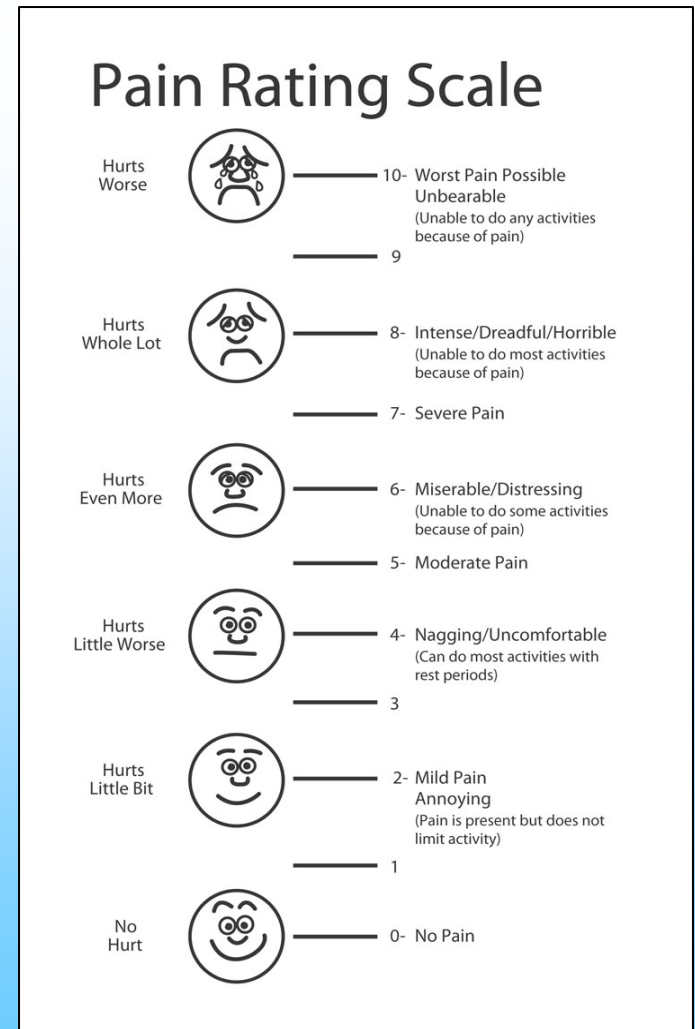
Pain Management

Pages 101 & 102

- The entire Pain Management Protocol is new. It was designed to:
 - Reduce suffering
 - Make transport easier (for patients and providers)
 - Is based on patient rating of pain
 - Must be used judiciously
 - Consult medical control when necessary
 - Can be offered to patients of almost any age

Pain Management – Assessment

- First, measure the level of pain
 - 0 – 10 scale for adults and older children
 - FACES scale for younger children
- Allow patient to remain in position of comfort (unless contraindicated)
- Monitor airway and vital signs every 5 minutes for unstable patients





Pain Management – Treatment Indications

- Acute myocardial infarction
- Acute pulmonary edema
- Burns
- Isolated injuries
- Acute sickle cell pain crisis
- Abdominal pain (with consult)
- EMS/DNR Palliative Care Protocol



Pain Management - Contraindications

- Head injury
- Hypotension
- Allergy or sensitivity to morphine, codeine, or percodan (or other opiates)
- Allergy to morphine



Pain Management – Administration

- Morphine can be given IV, IO, IM, SC
Adult: Dosages varies according to protocol.
 - AMI: Administer 2-5 mg slow IVP, followed by 1 mg every 5 minutes to a maximum of 10 mg or until pain is relieved.
 - Pulmonary Edema: Administer 2-10 mg slow IVP depending on age and weight of patient.
 - Isolated Injury (Burns, Frostbite, Eye Trauma) Administer 2-10 mg slow IVP at 1-2 mg/min increments to 10 mg or until pain is relieved.



Pain Management – Administration

- Morphine can be given IV, IO, IM, SC.
Pediatric (Frostbite, Burns, Eye and
Extremity Injury, Sickle Cell Crisis)

Dose: 0.1 mg/kg IVP/IO/IM/SC

Administer slowly 1-2 mg/min

Maximum dose of 5 mg

Repeat pain measurement after
administration, especially during
transport.



Common Myths about Pain

- Pain management will slow diagnosis.
 - Not true; may even make it go more rapidly.
- Don't give morphine for abdominal pain – may mask symptoms.
 - Not true; several studies have shown that diagnosis can be made just as easily if patient has had pain managed.



More Common Myths about Pain

- Kids don't feel pain like adults.
 - Not true – they feel it just as much but may not be able to tell you.
- Patients call 911 just to get drugs.
 - Primary responsibility of all health care professionals is to treat the patient and to provide pain relief.
 - Referrals can be made after arrival at ED.
 - Consult when in doubt.

Respiratory Distress: Allergic Reaction/Anaphylaxis

Page 103 Line d)(1) & 104 (j)(1)

- “Additional doses of epinephrine require medical consultation” was added to the Epinephrine dose on each page.

Respirator Distress: Allergic Reaction/Anaphylaxis

Page 103 Line d)(3) & Page 104 Line f)(1) & Page 105 (4)

- The dose of diphenhydramine was standardized and “slow” was added to the route of administration. It now reads:
 - Administer diphenhydramine
1 mg/kg slow IVP/IO or IM
Maximum single dose 25 mg
Additional doses of diphenhydramine require medical consultation.

Respiratory Distress: Allergic Reaction/Anaphylaxis

Page 105 Line (5)

- Respiratory Distress: Albuterol & Atrovent
 - For Infants less than 1 year of age
Albuterol 1.25 mg via nebulizer only
 - For Children 1- 2 years
Albuterol 1.25 mg and Atrovent 250 mcg
 - For patients greater than 2 years of age
Albuterol 2.5 mg and Atrovent 500 mcg

Respiratory Distress: Asthma/COPD

Page 107 Line (I)

- The section “Medical consultation is required if the child has a cardiac history.” was removed from line (I) and made a separate ALERT.

Respiratory Distress: Asthma/COPD

Page 107 Line o)

- Respiratory Distress: Albuterol & Atrovent
 - For Infants less than 1 year of age
Albuterol 1.25 mg via nebulizer only
 - For Children 1- 2 years
Albuterol 1.25 mg and Atrovent
250 mcg
 - For patients greater than 2 years of age
Albuterol 2.5 mg and Atrovent 500 mcg

Respiratory Distress: Croup

Page 109 Line e)

- “(Note: if inhaled normal saline decreases the patient’s level of distress and symptoms, continue this therapy en route to the appropriate receiving facility.)” was moved to line d) of this protocol.

Respiratory Distress: Pulmonary Edema/Congestive Heart Failure

Page 110 Line b)

- The medical consultation symbol was removed.
- Medical direction is not required.
- Reminder: Continuous Positive Airway Pressure (CPAP) is an Optional Supplemental Program.

Stroke: Neurological Emergencies

Pages 112 & 113

- The criteria was revised for transport to a Designated Stroke Center.
- “If the patient is a candidate for fibrinolytic therapy AND can be delivered to the hospital within 2 hours of sign/symptom onset, transport the patient to the closest Designated Stroke Center. If there is not one within 30 minutes go to the nearest hospital.”

KK. STROKE: NEUROLOGICAL EMERGENCIES

1. Initiate General Patient Care.

2. Presentation

Patient may present with numbness or weakness (often on one side only), difficulty speaking, blurred vision, dizziness, or a severe, unexplained headache. May be accompanied by seizures or altered mental status.

The Cincinnati Prehospital Stroke Scale

(Kothari R, et al. *Acad Emerg Med* 1997; 4:986-990.)

Facial Droop (have patient show teeth or smile):

- Normal – both sides of face move equally
- Abnormal – one side of face does not move as well as the other side

Arm Drift (patient closes eyes and holds both arms straight out for 10 seconds):

- Normal – both arms move the same or both arms do not move at all (other findings, such as strength of grip, may be helpful)
- Abnormal – one arm does not move or one arm drifts down compared with the other

Abnormal Speech (have the patient say "you can't teach an old dog new tricks"):

- Normal – patient uses correct words with no slurring
- Abnormal – patient slurs words, uses the wrong words, or is unable to speak



3. Treatment


- Administer oxygen at 2-6 liters via nasal cannula (unless hypoxic or in respiratory distress).
- Position patient lying flat or slightly elevated.
- Complete the Fibrinolytic Therapy Checklist for Ischemic Stroke.
- If the patient is a candidate for fibrinolytic therapy AND can be delivered to the hospital within 2 hours of sign/symptom onset, transport the patient to the closest Designated Stroke Center. If there is not one within 30 minutes, then go to the nearest hospital.



CONSULT WITH NEAREST DESIGNATED STROKE CENTER AS SOON AS POSSIBLE TO ALLOW HOSPITAL PREPARATION.

STROKE TREATMENTS ARE TIME SENSITIVE.



- Use Glucometer and treat if glucose less than 70 mg/dl.
- Initiate an IV LR KVO.
-  If the patient is hypotensive, obtain medical consultation.
- Obtain blood sample using closed system.
- Do not treat hypertension in the field.

Stroke: Neurological Emergencies

Page 113

- The checklist criteria was revised.
- The new criteria is: "The patient can be delivered to a Stroke Center within 2 hours of sign/symptom onset."

STROKE: NEUROLOGICAL EMERGENCIES (Continued)



STROKES ARE UNCOMMON IN CHILDREN. WHEN THEY OCCUR, IT IS LIKELY THAT THE CHILD WILL HAVE SICKLE CELL DISEASE. TRY TO DETERMINE WHICH PEDIATRIC SPECIALTY CENTER FOLLOWS THE CHILD AND INFORM LOCAL BASE STATION AND THE PEDIATRIC BASE STATION.



- j) Administer oxygen at 2-6 liters via nasal cannula (unless hypoxic or in respiratory distress).
- k) Position patient lying flat or slightly elevated.



- l) If a child presents with a SUSPECTED Stroke (e.g. sickle cell patient), consult with nearest pediatric base station and/or local base station.



- m) Use Glucometer and treat accordingly.
(See Section IV, Glucometer Protocol.)
- n) Initiate an IV LR KVO.
- o) If the patient is hypotensive, obtain medical consultation.
- p) Obtain blood sample using closed system.
- q) Do not treat hypertension in the field.

4. Continue General Patient Care.

Fibrinolytic Therapy Checklist for Ischemic Stroke

All of the "YES" boxes and all of the "NO" boxes must be checked before a patient should be transported to a "Designated Stroke Center".

INCLUSION CRITERIA (All of the "YES" boxes must be checked)

- YES
- q Age greater than or equal to 15 years
- q Signs and symptoms of stroke with neurologic deficit (abnormal Cincinnati Stroke Scale)
- q Patient can be delivered to a Stroke Center within 2 hours of sign/symptom onset

EXCLUSION CRITERIA (All of the "NO" boxes must be checked)

- NO
- q Active internal bleeding (eg, gastrointestinal bleeding or urinary bleeding within the last 21 days)
- q Known bleeding disorder
- q Within 3 months of intracranial surgery, serious head trauma, or previous stroke
- q Within 14 days of major surgery or serious trauma
- q History of intracranial hemorrhage
- q Witnessed seizure at stroke onset
- q History of cancer of the brain

Trauma Protocol: Burns

Page 114 Line 2.b)(2)

- The definition of electrical burn was expanded to include lightening or contact with high voltage (200 volts or greater).

Page 114 Line (4)

- A reference was added for patients with suspected toxic exposure.

Trauma Protocol: Burns

Page 114 ALERT

- A reference was added for toxic exposure. It now reads:
 - Patients With Suspected Carbon Monoxide Or Toxic Inhalation Without Major Burns Should Be Considered For Transport To The Hyperbaric Specialty Center. Patients In Closed Space Incidents Are More Likely To Experience Carbon Monoxide Or Toxic Inhalation And May Manifest Toxicity With Altered Mental Status"

Trauma Protocol: Burns

Page 115 ALERT

- The ALERT regarding the placement of ice on a burn was revised. Ice should not be placed on a burn if the patient has a TOTAL of 5% or greater burned body surface area.
- The new section reads: "Do Not Place Ice On Any Patient With Burns Greater Than 5% Total Body Surface Area."

Trauma Protocol: Burns

Page 115 Line 1)

- The dosage of morphine for isolated trauma was revised. A maximum dose was added. The revised dosage is:
 - Consider morphine sulfate
0.1 mg/kg slow IV/IO/IM
Administer 1-2 mg/min
Maximum dose 5 mg

Trauma Protocol: Eye Trauma

Page 117 Line 1)

- The dosage of morphine for eye trauma was revised. A maximum dose was added. The revised dosage is:
 - Consider morphine sulfate
0.1 mg/kg slow IV/IO/IM
Administer 1-2 mg/min
Maximum dose 5 mg

Trauma Protocol: Hand/Extremity Trauma

Page 119 Line j)

- The dosage of morphine for hand/extremity was revised. A maximum dose was added. The revised dosage is:
 - Consider morphine sulfate
0.1 mg/kg slow IV/IO/IM
Administer 1-2 mg/min
Maximum dose 5 mg

Trauma Protocol: Multiple/Severe Trauma

Page 120 Line d)

- The Hyperventilation rates were adjusted to match the General Patient Care Protocol.
- “Hyperventilate the head-injured patient as follows: Adult 20 breaths per minute, Child 30 breaths per minute, Infant 35 breaths per minute (1) Who has signs of herniation such as unequal pupils, posturing, or paralysis (2) Who is manifesting a rapidly decreasing GCS or, (3) With on-line medical consultation.”

Trauma Protocol: Multiple/Severe Trauma

Page 121 Line i)

- The use of PASG was removed from this protocol for pediatric patients.

Trauma Protocol: Multiple/Severe Trauma

Page 121 Line k)

- A reference for Volume Sensitive Children has been added:
 - "OR, For volume sensitive children administer initial fluid bolus of 10 ml/kg LR IV/IO. If patient's condition does not improve, administer the second bolus of fluid at 10 ml/kg LR IV/IO. Volume sensitive children include: neonates (0-28 days), children with congenital heart disease, chronic lung disease, or chronic renal failure."

Trauma Protocol Spinal Cord Injury

Page 125 Lines l) & p)

- The use of PASG was removed from this protocol for pediatric patients.

Trauma Protocol: Spinal Cord Injury

Page 125 Line m)

- A reference for Volume Sensitive Children has been added:
 - "OR, For volume sensitive children administer initial fluid bolus of 10 ml/kg LR IV/IO. If patient's condition does not improve , administer the second bolus of fluid at 10 ml/kg LR IV/IO. Volume sensitive children include: neonates (0-28 days), children with congenital heart disease, chronic lung disease, or chronic renal failure."

Trauma Protocol: Trauma Arrest

Page 127 Lines o) & s)

- The use of PASG was removed from this protocol for pediatric patients.

Glossary

Pages 133-139

- The following terms were added to the Glossary:
 - Apnea
 - Children With Special Healthcare Needs
 - Emergency Information Form
 - Erythema
 - Fluid Bolus
 - Fluid Challenge
 - Neonatal
 - Newly Born
 - Optional Supplemental Program
 - Pallor
 - Pilot Program
 - Volume Sensitive Children

Procedures, Medical Devices, and Medications for EMS and Commercial Services

Page 140

- SQ was changed to SC.

Page 141

- Peak Expiratory Flow Meter was added to the chart and is a Standing Order (SO) for all ALS providers.

Page 142

- Activated charcoal shall only be administered without sorbitol.
- Etomidate was added for jurisdictions participating in RSI Pilot Program.
- Ipecac was deleted.

Airway Management: Bag Valve Mask Ventilation

Page 161 Lines b)(3)(a) & (b)

- The symptomatic bradycardia rate for an infant and child was revised. The new section reads:
 - Symptomatic Bradycardia
 - (a) Infant heart rate less than 100
 - (b) Child heart rate less than 80

Airway Management: Tracheostomy Change and Suction

Pages 172-174 New Procedure
Description for both BLS and ALS



Tracheostomy:

A surgical opening in the trachea into which a special tube is placed



Removing a Tracheostomy Tube: *Step 1*



- ALWAYS have at least one additional provider to assist
- Proper patient positioning



Removing a Tracheostomy Tube: *Step 2*

Remove old trach tube

1st person: holds patient

2nd person:
removes trach
tube



Removing a Cuffed Tracheostomy Tube: *Step 1*



Empty Syringe
Attached, Balloon
Full



Syringe Full,
Balloon Empty

Removing a Cuffed Tracheostomy Tube: *Step 2*



Cutting the Ties



Removing the Trach,
Ties Dangling



RULES for Inserting a Tracheostomy Tube

Preparation:

- Proper positioning of the patient
- “Ready to go” trach set includes
 - Trach with obturator and ties attached (ideal)
- Suction equipment
- Normal saline/sterile water

RULES for Inserting a Tracheostomy Tube

- When possible, lubricate the new tube before insertion
- If lubricant not available, use saline or water



Prepare the trach tube with lubricant

Insertion of a Tracheostomy Tube

(Always a two person job)



If you meet resistance : **STOP !**

Insertion of a Tracheostomy Tube



Obturator Being Removed

Insertion of a Tracheostomy Tube



**Inserting Inner
Cannula**



**Inner Cannula
In Place**

Insertion of a Tracheostomy Tube



Trach Held in Place, Connect Bag Valve to Tracheostomy and Ventilate While Listening to Breath Sounds



Securing the Tracheostomy Tube



Syringe Full,
No Air In Cuff



Cuff Inflated,
Syringe Empty



Securing the Tracheostomy Tube



One Fingertip Fits Under the Adult Ties



Baby with One Fingertip



Summary:

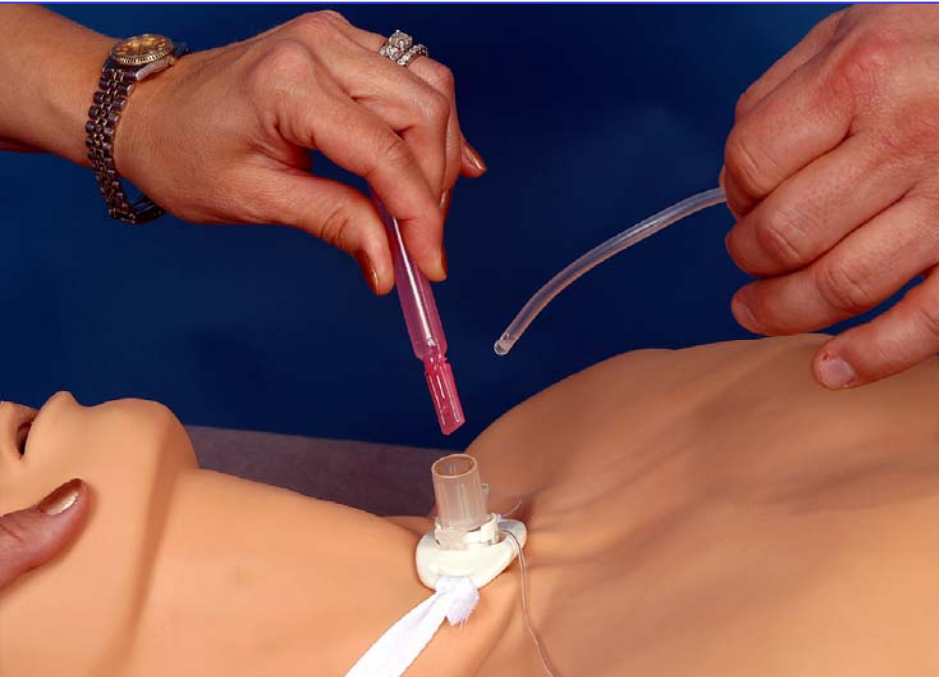
Steps to Change a Tracheostomy Tube

- Gather equipment
- Lay the person flat and midline
- Hyperextend the neck (towel roll)
- Lubricate new trach tube
- Deflate old cuff, if appropriate, WITH syringe
- Untie/cut old ties, pull out old trach
- Put in new trach, remove obturator
- Attempt to ventilate
- Secure the new tracheostomy tube

Trach/Suction Catheter Sizing

Trach Size	Catheter Size
00 – 3.5 trach tube	5-6 French catheter
4.0 – 4.5 trach tube	8-10 French catheter
5.0 – 5.5 Trach tube	10-12 French catheter
6.0 – 7.0 Trach Tube	14 French catheter
7.0 – 8.0 Trach Tube	16 French catheter
8.0 – 9.0 Trach Tube	18 French catheter

Suction Is Available: *Step 1*



Instilling Saline into
Adult Trach



Instilling Saline
into Baby Trach

Suction Is Available: Supplemental Oxygen *Step 2*



BV to trach
pre-suction



BV to trach
pre-suction

Suction: Inserting Suction Catheter Step 3

- Keep fingers at the measured depth to insert the catheter
- Insert suction catheter without applying suction



Suction: Step 4



Apply suction:

- Cover the opening on catheter
- For NO MORE than 5-10 seconds (hold your breath comfortably)

Suction: *Step 5*



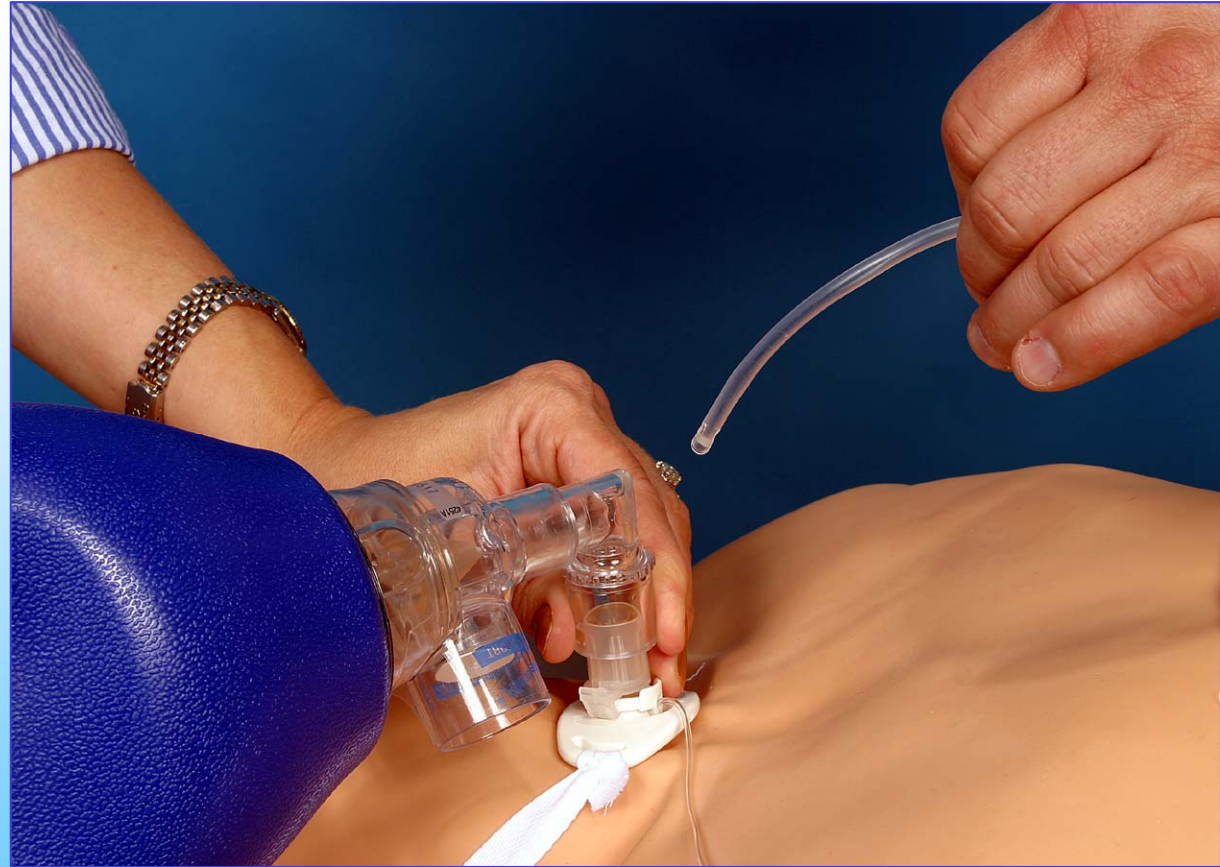
Twisting



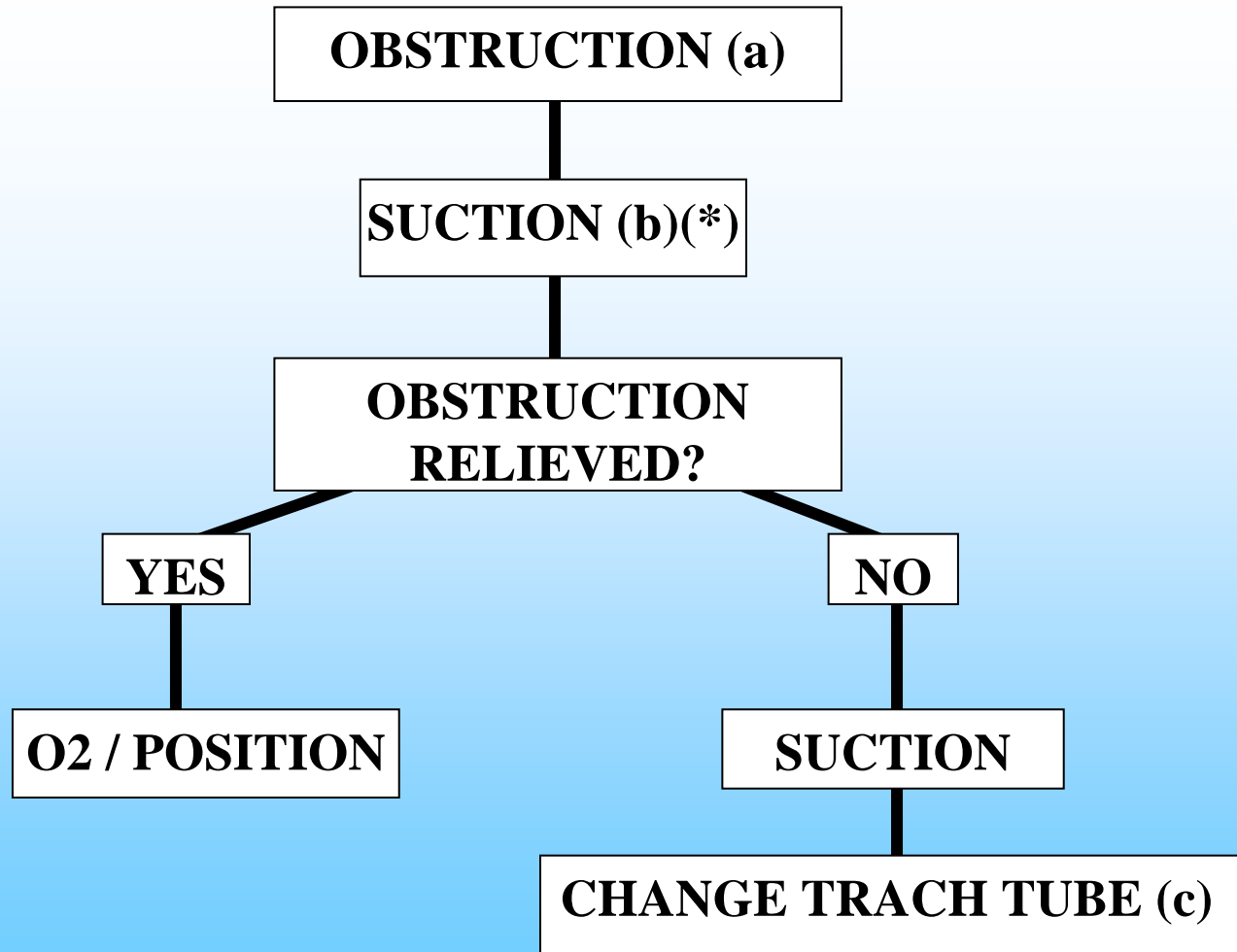
Twisting the Catheter
Between Fingers as
Withdraw

Re-oxygenate the Patient

Re-oxygenate the patient between suctioning attempts



Obstructed Trach Algorithm



Hypoprofusion Adjunct: PASG Pneumatic Antishock Garment [a.k.a. MAST]

Page 182 Line (3)

- The use of PASG was removed from this protocol for pediatric patients.
- **Line c)(6)** Contraindications
 - “Children less than 15 years of age” was added as a contraindication.

Peripheral IV Access for CRT, CRT-(I) & EMT-P and IV Access Option For EMT-B Approved EMS Operational Programs

- **Page 192 b)(7)** "The ALS provider may establish a peripheral IV in a patient whose vasoactive medication has been interrupted due to malfunctioning long-term access device that cannot be repaired by the home health caregiver. The ALS provider can assist in reestablishment of an existing vasoactive infusion at the same dose or setting. Patient shall be transported to the nearest appropriate facility to access patient's long-term device. When in doubt, obtain medical consultation."

IV for Interrupted Vasoactive Infusions

- Vasoactive drugs can have profound positive effects when infusion is working correctly and catastrophic effects when they are suddenly interrupted.
- The half life of some of these medications can be extremely short (eg 3-5 min.) which means their effect will disappear rapidly within 3-30 min. This can lead to decreased cardiac output with sudden loss of blood pressure and cardiac arrest in some instances.
- Continuation of leaky infusion is better than no infusion. Leave it running.

IV for Interrupted Vasoactive Infusions

- Have family member check to assure that pump is turned on and make sure the line is not clamped.
- Does this correct problem?
- EMS provider shall NOT turn off pump.
- The discharge planners for these patients do not teach families to restart IV.
- Reestablishment of the infusion through peripheral IV access is essential.
- Patients and family members will have a back-up pump and medication. Once the peripheral vasoactive infusion is established, have family stop the occluded or leaking infusion through the central or PICC line.

Hub to Hub Connection

- The IV catheter should be flushed with sterile water, saline or LR then the infusion should be connected directly between the IV catheter hub and infusion pump tubing hub (do NOT use your IV tubing or Saline lock cap/tubing).
- The family or patient will set the pump and establish the rate which may be as low as 2cc an hour.

Precautions

- Do NOT flush or bolus the vasoactive medication. Too much can also be bad.
- EMS provider shall NOT turn off pump.
- Do NOT put anything else through the vasoactive medication line.
- If EMS medications are indicated, start a second IV with LR for medication administration.

Activated Charcoal

Pages 199 & 205

- Activated Charcoal
 - Only administered without Sorbitol

Epinephrine Auto-injector

Page 201 Line c)

- Cardiac patients have been added to the list of patients that require medical consultation prior to administration.
- The new text reads:
 - “Unless in severe allergic reaction or severe asthma, medical consultation should be obtained before administering to a pregnant or cardiac patient.”

Ipecac

- Ipecac was deleted from the Maryland Medical Protocols for EMS Providers.

Nitroglycerin

Page 202 Line d)(5)

- The contraindication has been revised.
 - Nitroglycerin is contraindicated for any patient who has taken a medication for erectile dysfunction (Viagra, Cialis, or Levitra) in the past 48 hours. Previously it was only contraindicated for 24 hours.

Aspirin

Page 208 Line g)(1)

- The dose of aspirin was changed.
- Aspirin should be administered to a patient meeting the indications at a dose of 325 mg chewed.

Atropine Sulfate

Page 209 Line c)(4)

- Nerve agents were added to the list of indications.

Page 210 Lines g)(2) & g)(4)

- A reference for nerve agent exposure was added.
- A maximum single dose of atropine for pediatric patients has been established:
 - Child (10-25 kg) 0.5 mg
 - Adolescent (25-40 kg) 1 mgThe dose may be repeated one time.

Atrovent (Ipratropium)

Page 212 Line g)(2)

- The dosage section was reformatted. Atrovent is contraindicated for an infant less than 1 year of age.

Diazepam (Valium)

Page 216 Lines g)(1) & (2)

- A reference to allow the IM administration of Valium was added.
- IM administration requires medical direction.

Diazepam (Valium)

Page 216 Lines g)(2) & (3)

- The rectal dose of valium for a child has been lowered. The new dose is:
 - Up to 0.2 mg/kg rectal, Maximum total dose 10 mg.
- A reference for severe nerve agent exposure has also been added.
- If severe nerve agent exposure is suspected, providers may administer diazepam without medical consultation.

Diltiazem (Cardizem)

Page 217 Line h)(1)(a)

- A maximum dose has been added for Diltiazem:
 - "0.25 mg/kg (maximum dose 20 mg) by IV bolus administered slow IV over 2 minutes; if response was not adequate, repeat in 15 minutes with a dosage of 0.35 mg/kg (maximum dose 25 mg) over 2 minutes."

Diphenhydramine Hydrochloride (Benadryl)

Page 219 Line g)(3)

- A requirement for medical consultation was added.
 - If a patient is experiencing a “mild allergic reaction,” medical consultation is required.
 - Medical consultation has always been required for doses greater than 25 mg.

Epinephrine

Pages 222-224

- Revised epinephrine dose
 - All doses IV/IO
 - 0.01 mg/kg (0.1 mL/kg) of the 1:10,000
 - Repeat every 3-5 minutes
 - ETT administration
 - 0.1 mg/kg 1:1,000 (0.1 mL/kg)
 - Dilute in 3-5 mL of LR
 - Repeat every 3-5 minutes
 - Neonates (0-28 days)
 - 0.01 mg/kg (0.1 mL/kg) of 1:10,000 IVP/IO
 - Repeat every 3-5 minutes
 - ET: 0.01 mg/kg of 1:10,000 diluted with 1 mL of LR

Furosemide

Page 225 Line c)

- “Hypertension” was deleted as an indication for the administration of furosemide.

Page 225 Line g)

- “Except in hypertensive crisis” has been eliminated from the paramedic may administer without consult.

Ipecac

- Ipecac has been removed from the Maryland Medical Protocols for EMS Providers.



Lactated Ringers

for Volume Sensitive Children

Page 229 Line (3)(c)

- Definition: children that need smaller fluid bolus volumes due to special needs including:
 - neonates (birth to 28 days)
 - congenital heart diseases
 - chronic lung disease
 - chronic renal failure
- Fluid bolus for volume sensitive children is 10 mL/kg of LR.
- Fluid bolus for other infants and children is 20 mL/kg.

Morphine Sulfate – Pediatric Dosage

Page 233 Line g)(1)(c)

- Morphine Sulfate dosing was standardized.
 - Pediatric: 0.1 mg/kg IVP/IO/IM
Administer slow 1-2 mg/min
Maximum dose 5 mg
- A maximum pediatric dose of 5 mg has been added to all the protocols:
 - Cold Emergencies
 - Burns
 - Eye Trauma
 - Hand/Extremity Trauma

Page 233 Line g)(1)(e)

- Morphine may be administered for pacing.
Administer 1-2 mg/min IVP

Nitroglycerin

Page 235 Line d)(3)

- The text has been revised.
 - Nitroglycerin is contraindicated for any patient who has taken a medication for erectile dysfunction (Viagra, Cialis, or Levitra) in the past 48 hours. Previously it was only contraindicated for 24 hours.

Rapid Sequence Intubation Protocol Package

Pages 246 & 247

- Etomidate was added throughout the Rapid Sequence Intubation protocol.
- A protocol approved in July of 2004 allowing RSI to be performed on children less than 10 years of age was also added.
- Both the adult and pediatric RSI programs remain Pilot Programs and require the permission of the State EMS Medical Director to participate.

Optional Supplemental Program CPAP

Page 262 Line b)(1)

- This line was changed to point out that CPAP does not guarantee the elimination of infection but is a less invasive procedure with a lesser risk of infection.

Glycoprotein IIb/IIIa Antagonist

Page 264 Line 7.a)

- INITIAL BOLUS: The text was revised to insure the provider understands the initial bolus of the medication must be administered in the hospital setting by a physician or RN.

Page 264 Line 7.b)

- MAINTENANCE IV DRIP: The text was revised to include maintaining appropriate rate based on physician's orders.

Optional Supplemental Program MARK I Kits

Page 269 Line 5.b) & Page 270 Line e)(4)

- Administration of MARK I Kits
 - An EMT-B may administer MARK I Kits (up to a total of 3) as buddy care to public safety personnel only
OR
 - When directed by an ALS provider based on signs and symptoms in an MCI
OR
 - On-site chemical testing, confirming nerve or organophosphate agent presence in an MCI

Optional Supplemental Program MARK I Kits

Page 269 Line 5.b) & Page 270 Line e)(4)

- Administration of the diazepam 10 mg auto-injector (CANNA)
 - Can only be administered when three MARK I Kits are administered in a severe exposure by an ALS provider.
 - Medical consultation is not required in these situations.

Optional Supplemental Program MARK I Kits

Page 270 Line (3)(b) & Line (4)(c)

- The repeat dose of Atropine has been revised:
 - The 2 mg dose of Atropine may be repeated in 10 minutes if the patient remains symptomatic.
- Line e)(4)
 - For patients with “Severe nerve agent exposure, Providers may administer diazepam without medical consultation.”

Optional Supplemental Program Transport of Ventilated Patients

Pages 272 & 275 Lines 6.(b) & 6.(a)

- The requirement of reporting each individual use of a ventilator to the Office of the State EMS Medical Director was removed.
- This protocol applies only to those jurisdictions participating in the Optional Ventilator Program.

Weapons of Mass Destruction

Page 17 Line 3.a.(1)

- The dosing of atropine and pralidoxime was revised.

Page 24

- The chart was revised to match the new dosing.