



DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Date: January 24, 2005

To: Holders of Policy and Procedure Manuals

From: Diane Claytor RN MS
EMS Program Administrator

Subject: Update to Policy Manual, Change Notice #23

Enclosed please find Update # 23 to the EMS Policy and Procedure Manual. Update # 23 includes the policies in update # 22 with corrections in several of the policies regarding EMT administration of Epi-pens. Please add the new signature page and replace the Table of Contents. Log the Change Notice on the appropriate page.

If any change was made in the policy, the complete policy is included in the packet. This is to decrease the potential for error that might be caused by replacing single pages.

The packet includes the following policies:

- 5002 – Ambulance Supply/Equipment Requirements
- *8202 – Primary Survey and Detailed Physical Assessment
- *8214 – Auto-Injector Epi-Pen/Prefilled Syringe
- *8215 – Nerve Gas Auto-injector Self-Administration
- *8300 – Adult Medications
- *8302 – Cardiac Emergencies
- *8303 – Medical Emergencies
- *8304 – Respiratory Emergencies
- *8305 – Neurological Emergencies
- *8310 – Pediatric Treatment Guidelines
- *8312 – Pediatric Medications
- *8414 – Combitube Insertion
- *8415—Pediatric Intubation

Items contained in the **Patient Care Manual** are indicated with a (*), should you choose to update those manuals.

If you have not received training on these changes, please contact your CQI Liaison or Training Officer. Please assure that the changes are made in your manual.

Thank you.

COUNTY OF MARIN

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Division of Health Services

Emergency Medical Services Program

Policy and Procedure Manual

January, 2005

Diane Claytor, RN, MS, EMS Program Administrator

William Teufel, MD, EMS Program, Medical Director

EMS Program Policy & Procedure Manual

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EMS Policy & Procedures Manual

Record of Change

Keep your policy manual current. After receiving and filing additional or revised policies/protocols, initial and date the block following the appropriate change.

There should not be any blank boxes between initialed blocks; this means you either failed to record the CHANGE NOTICE or have not received it. Notify the Marin County EMS Office if you did not receive a CHANGE NOTICE.

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PATIENT ASSESSMENT PRIMARY SURVEY

The purpose of the primary survey is to identify and immediately correct life-threatening problems.

SCENE SIZE-UP/GLOBAL ASSESSMENT

- ◆ Recognize hazards, ensure safety of scene and secure a safe area for treatment
- ◆ Apply appropriate universal body/substance isolation precautions
- ◆ Recognize hazards to patient and protect from further injury
- ◆ Identify number of patients and resources needed
 - Call for EMS and/or law enforcement back-up if appropriate
 - Initiate Incident Command Structure System (ICS) if appropriate
 - Initiate triage system if appropriate
- ◆ Observe position of patient
- ◆ Determine mechanism of injury
- ◆ Plan strategy to protect evidence at potential crime scene
- ◆ Identify yourself to the patient

GENERAL IMPRESSION

- ◆ Check for life threatening conditions
- ◆ AVPU (A=alert, V=responds to verbal stimuli, P=responds to painful stimuli, U=unresponsive)
- ◆ Determine chief complaint and/or mechanism of injury

AIRWAY

- ◆ Ensure open airway
- ◆ Protect spine from unnecessary movement in patients at risk for spinal injury
 - Ensuring airway patency supersedes spinal immobilization
- ◆ Look and listen for evidence of upper airway problems and potential obstructions
 - Vomitus
 - Bleeding
 - Loose or missing teeth
 - Dentures
 - Facial trauma
 - Utilize any appropriate adjuncts (OPA/NPA) as indicated to maintain airway, however reconsider use of OPA/NPA in setting of complex nasal trauma.

BREATHING

- ◆ Look, listen, and feel assessing ventilation and oxygenation
- ◆ Expose chest and observe chest wall movement if necessary
- ◆ Determine approximate rate, depth and work of breathing
- ◆ Reassess mental status
- ◆ Obtain pulse oximetry reading if available
- ◆ Do not delay O₂ administration to obtain pulse ox reading if in respiratory distress
- ◆ Intervention for inadequate ventilation and/or oxygenation:
 - Pocket mask BVM
 - Supplementary oxygen
 - Advance airway management if indicated after bag-valve mask ventilation

CIRCULATION

- ◆ Check for pulse and begin CPR if necessary
- ◆ CPR First (90 seconds) - If unwitnessed & downtime > 5 min., or unlikely primary respiratory based situations (peds or young adults/drowning/trauma/allergic/overdose)
- ◆ If witnessed and/or primary respiratory arrest scenario (as above), use defibrillator to check patient for a shockable rhythm.
- ◆ Control life-threatening hemorrhage with direct pressure
- ◆ Palpate radial pulse if appropriate: absence or presence; quality (strong/weak); rate (slow, normal, or fast); regularity
- ◆ Assess mental status for signs of hypoperfusion
- ◆ Assess skin for signs of hypoperfusion or hypoxia
- ◆ Treat hypoperfusion if appropriate

LEVEL OF CONSCIOUSNESS & DISABILITIES

- ◆ Determine need for C-Spine stabilization
- ◆ Determine Glasgow Coma Scale (GCS) Score
- ◆ Determine glucose level (D-stick), D₅₀ as needed
- ◆ Narcan SQ if clinically suspicious for opiate overdose

EXPOSE, EXAMINE & EVALUATE

- ◆ In situations with suspected life-threatening trauma mechanism, a Rapid Trauma Assessment should be performed
 - Expose head, trunk, and extremities
 - Head to toe for DCAP-BTLS (see Notes section of SECONDARY SURVEY Protocol)
 - Head, Neck, Chest, Abdomen, Pelvis, Extremities
- ◆ Treat any newly discovered life-threatening wounds as appropriate
- ◆ Assist patient with medications if appropriate

ADDITIONAL COMMENTS

1. Oxygen Administration:

- In general, utilize clinical judgment to administer O₂ appropriate to patient condition.
- Oxygen administration is not to be excluded based on a saturation value obtained by pulse oximetry. Patients with conditions including, but not limited to, ischemic chest pain, trauma, respiratory conditions, CHF, CO poisoning, and complications of third trimester pregnancies should receive appropriate concentrations of oxygen regardless of O₂ saturations. Like other physiologic parameters, pulse oximetry is used only as a guide in providing overall care to the patient.
- If there is a history of COPD, observe for respiratory depression and support respirations as needed. Do not withhold oxygen from a patient in distress because of a history of COPD.
- If the patient presents with signs and symptoms of pulmonary edema or severe respiratory distress, O₂ should be initiated at 15 L/minute by non-rebreather mask.

2. Glasgow Coma Scale:

ADULT

Eye Opening	Verbal Response	Motor Response
4=Spontaneous	5=Oriented	6=Obeys Commands
3=To verbal stimuli	4=Confused	5=Purposeful/Localizes pain
2=To painful stimuli	3=Inappropriate words	4=Withdraws to pain
1=No Response	2=Sounds	3=Flexion to pain
	1=No Response	2=Extension to pain
		1=No Response

USING THE GCS TO ASSESS INFANTS AND YOUNG CHILDREN:

Eye Opening	Verbal Response	Motor Response
4=Spontaneous	5=Smiles, oriented to sounds, follows objects, interacts	6=Obeys Commands
3=To verbal stimuli	4=Cries but is consolable; inappropriate interactions	5=Purposeful/Localizes pain
2=To painful stimuli	3=Inconsistently consolable, moaning	4=Withdrawal from pain
1=No response	2=Inconsolable, agitated	3=Flexion to pain
	1=No vocal response	2=Extension to pain
		1=No motor response

3. Patient Positioning

- Conscious, no trauma, good gag reflex: Position of comfort
- Depresses LOC, no trauma, decreased gag reflex: Left lateral position
- Trauma: Spine immobilization as needed. (see “Spinal Immobilization Procedure”)
- Pregnancy: If more than 20 weeks pregnant, transport in semi-fowlers, or left lateral decubitus position. If the patient requires spinal immobilization, secure to a backboard first and tilt the board 20-30 degrees to the left.
- Respiratory Distress: Fowler’s position or position of comfort

DETAILED PHYSICAL ASSESSMENT (Previously Secondary Examination)

BACKGROUND:

The detailed physical assessment is the systematic assessment and complaint focused relevant physical examination of the patient. This exam may be done concurrently with the patient history and should be performed after completion of the following:

- ◆ Primary Survey
- ◆ Initial treatment and stabilization of life-threatening airway, breathing and circulation difficulties
- ◆ Spinal stabilization as needed
- ◆ Beginning transport in the potentially unstable or critical patient
- ◆ A Rapid Trauma Assessment in the case of significant trauma
- ◆ An initial set of vital signs (after stabilization of ABCDE's)
 - ◆ Pulse
 - ◆ Blood pressure
 - ◆ Respiration
 - ◆ Lung sounds
 - ◆ Cardiac rhythm (if indicated)
 - ◆ Pulse oximetry (if available)
- ◆ Initial treatment including oxygen, ventilation if indicated, hemorrhage control if needed, basic wound/fracture care, and IV access if indicated/capable. IV access refers to an intravenous line, with isotonic crystalloid solution (Normal Saline) at a keep vein open rate, unless otherwise noted in individual protocol.
- ◆ Investigation of the chief complaint (CC) and associated complaints, signs or symptoms
- ◆ Further history of present illness (HPI) should be obtained as follows:
 - Optimally should be obtained directly from the patient; if language, culture, age-related, disability barriers or patient condition interferes, consult family members, significant others, scene bystanders or first responders. Check for advance directives, patient alert bracelets and prescription bottles as appropriate. Be aware of patient's environment and issues such as domestic violence, child or elder abuse or neglect.
 - **A** - Medication Allergies
 - **M** – Medications (see notes below)
 - **P** - Past medical history relevant to chief complaint. Examples are previous myocardial infarcts, hypertension, diabetes, substance abuse, seizure disorder and hospital of choice.
 - **L** – Last meal, last menstrual period, last similar event, last medical visit/hospital admission.

-
- **E** – Event details: Mechanism of injury if appropriate, pain questions if appropriate: OPQRST (O=onset, P=provoked, Q=quality, R=radiation, S=severity, T=time) plus location and factors that increase or decrease the pain severity
 - Have patient prioritize his/her chief complaint if complaining of multiple problems
 - See “Information Needed” section of each specific Protocol.

The above set of assessments/treatments is referred to in these protocols as “**Routine Medical Care (RMC)**”. This care should be provided to all patients regardless of presenting complaint. The purpose of the detailed physical assessment is to identify problems, which, though not immediately life- or limb-threatening, could increase patient morbidity and mortality. Exposure of the patient for examination may be reduced or modified as indicated due to environmental factors.

DETAILED PHYSICAL ASSESSMENT:

HEAD AND FACE

- ◆ Observe and palpate skull (anterior and posterior) and face for DCAP-BTLS*
- ◆ Check eyes for: equality and, responsiveness of pupils, movement and size of pupils, foreign bodies, discoloration, contact lenses, prosthetic eyes
- ◆ Check nose and ears for: foreign bodies, fluid, and blood
- ◆ Recheck mouth for potential airway obstructions (swelling, dentures, bleeding, loose or avulsed teeth, vomitus, malocclusion, absent gag reflex) and odors, altered voice or speech patterns, and evidence of dehydration

CHEST

- ◆ Observe and palpate for DCAP-BTLS, scars, implanted devices (AICD or pacemakers), medication patches, chest wall movement, asymmetry and accessory muscle use
- ◆ Have patient take a deep breath if possible and observe and palpate for signs of discomfort, asymmetry and air leak from any wound

ABDOMEN

- ◆ Observe and palpate for DCAP-BTLS, scars, diaphragmatic breathing and distention
- ◆ Palpation should occur in all four quadrants, taking special note of tenderness, masses and rigidity

PELVIS/GENITO-URINARY

- ◆ Observe and palpate for DCAP-BTLS, asymmetry, sacral edema, and as indicated for incontinence, priapism, blood at urinary meatus, or presence of any other abnormalities
- ◆ Palpate and gently compress lateral pelvic rims and symphysis pubis for tenderness, crepitus or instability

-
- ◆ Palpate bilateral femoral pulses

SHOULDERS AND UPPER EXTREMITIES

- ◆ Observe and palpate for DCAP-BTLS, asymmetry, skin color, capillary refill, edema, medical information bracelets, and equality of distal pulses
- ◆ Assess sensory and motor function as indicated

LOWER EXTREMITIES

- ◆ Observe and palpate for DCAP-BTLS, asymmetry, skin color, capillary refill, edema, and equality of distal pulses
- ◆ Assess sensory and motor function as indicated

BACK

- ◆ Observe and palpate for DCAP-BTLS, asymmetry, and sacral edema

PATIENT MEDICATIONS:

- ◆ The medication list should include prescription and over-the counter meds including, but not limited to aspirin, other pain medications, cold and allergy meds, herbal meds, and birth control pills
- ◆ If possible, bring the patient medication bottles to the hospital
- ◆ Field personnel may allow the patient to take his/her medications if the patient can self-administer medications. In most cases, these medications should only include anaphylaxis kit drugs, and metered dose inhalers. For moderate/severe allergic reaction/anaphylaxis, **Auto-Injector Epi-Pen SQ (or pre-filled syringe)***; MR in 5 min. *Only EMTs trained in Auto-Injector Epi- Pen may perform this procedure (2 hrs per State Protocol)*

PRECAUTIONS AND COMMENTS

- ◆ Management of life-threatening problems takes precedence over gathering of information
- ◆ The HPI evaluation should include open-ended questions and not “lead” the patient – for example: “tell me about/describe your chest pain,” not “is your chest pain sharp?”
- ◆ The HPI is commonly obtained before or during the physical exam (PE)
- ◆ A systematic approach will enable the rescuer to be rapid and thorough and not miss subtle findings that may become life-threatening
- ◆ Minimize scene time on trauma patients—for critical trauma patients conduct secondary survey en route to the hospital when time allows
- ◆ The Detailed Physical Assessment should ONLY be interrupted if the patient experiences airway, breathing or circulatory deterioration requiring immediate intervention. Complete the examination before treating the other identified problems
- ◆ Reassess vital signs frequently, particularly in critical or rapidly-changing patients. Changes and trends observed in the field are essential data to be documented and communicated to the receiving facility staff

NOTES:

*DCAP-BTLS: A mnemonic that stands for:

Deformity *Contusion/Crepitus* *Abrasion* *Puncture* *Bruising/Bleeding*
Tenderness *Laceration* *Swelling*

ADMINISTRATION OF AUTO-INJECTOR EPI-PEN/PREFILLED SYRINGE

I. PURPOSE

To outline acceptable methods for the trained EMT to administer the Auto-Injector Epi-pen or the Auto Injector Epi-pen Jr. (or corresponding pre-filled syringe) to patients suspected of an anaphylactic reaction and/or severe asthma. *Only EMTs with Epi-Pen training (2 hrs per State Protocol) may administer Epi-Pen emergency treatment.*

II. ADMINISTRATION OF EPI-PEN

A. Patients in severe distress with a history of anaphylaxis or asthma and any combination of the following symptoms are candidates for the administration of Auto-Injector Epi-Pen or pre-filled syringe by trained EMTs:

1. Stridor
2. Bronchospasm/wheezes/diminished breath sounds
3. Severe abdominal pain
4. Respiratory distress (nasal flaring or grunting in pediatric patients)
5. Tachycardia
6. Shock (systolic BP < 100)
7. Edema of tongue, lips, face
8. Generalized urticaria

B. No exclusion criteria to administer Epi-Pen for patients in Severe Anaphylaxis (see Allergic Reaction and Anaphylaxis protocol).

However, for patients with moderate allergic reactions or severe asthma and the patient is under age 5 or over age 65, **Physician Consult is required** prior to the administration of epinephrine.

C. Epinephrine 1:1000 SQ Dosage:

- a. Adult: (30 kg or 66 lbs) – adult auto-injector (0.3 mg SQ, 0.3ml)
- b. Infant and child: (under 30 kg or 66 lbs) – pediatric auto-injector (0.15 mg SQ, 0.15ml)

Category: Patient Care
EMT Procedures
Auto-Injector Epi-Pen /Prefilled Syringe

Policy No: 8214
Date: 1/01/03
1/03/05

- D. Record time of injection and reassess in 2 minutes.
- E. A second injection in 5 minutes may be necessary
- F. Pulse oximetry if available
- G. Monitor airway, and be prepared to assist with ventilations if necessary.

Nerve Gas Autoinjector Self-Administration

I. Purpose

To outline the indications and procedure for nerve gas autoinjectors for EMS personnel.

II. Policy

- A. Nerve Gas auto-injectors are to be used when EMS personnel are exposed to nerve agents (Sarin, Soman, Tabun, Vx) and have signs and symptoms of nerve agent exposure.
- B. Nerve agent antidote medications are **NOT GIVEN PROPHYLACTICALLY**.

III. Procedure

A. Confirm suspicion of exposure and identify signs and symptoms:

- Unexplained runny nose
- Tightness in the chest
- Difficulty breathing
- Bronchospasm
- Pinpoint pupils resulting in blurred vision
- Drooling
- Excessive sweating
- Nausea and/or vomiting
- Abdominal cramps
- Involuntary urination and/or defecation
- Jerking, twitching and staggering
- Headache
- Drowsiness
- Coma
- Convulsions
- Apnea

Mnemonic for Nerve Agent Exposure
--

S alivation
L acrimination
U rination
D efecation
G astronintestinal pain & gas
E emesis

B. Inject Self With Autoinjector

1. Mark 1 autoinjector antidote kit:
 - a. Atropine autoinjector (2 mg. In 0.7 ccs)
 - b. Pralidoxime chloride autoinjector—2-PAM (600 mg. In 2 ccs)
2. Dosage Scheme for Mark 1 Administration

Signs & Symptoms	Onset	# of autoinjectors to use:
Vapor: small exposure <ul style="list-style-type: none">• Pinpoint pupils• Runny nose• Mild SOB	Seconds	Mark 1 autoinjector antidote Kit— 1 dose initially (containing atropine & 2-PAM) <i>May repeat x 1 in 10 minutes</i>
Liquid: small exposure <ul style="list-style-type: none">• Sweating• Twitching• Vomiting• Feeling weak	Minutes to hours	Mark 1 autoinjector antidote Kit— 1 dose initially (containing atropine & 2-PAM) <i>May repeat x 1 in 10 minutes</i>
Both: large convulsions <ul style="list-style-type: none">• Convulsions• Apnea• Copious secretions	Seconds to hours	Mark 1 autoinjector antidote Kit— 3 doses initially (containing atropine & 2-PAM)

IV. Training of EMS Personnel

- A. Provider Medical Directors shall coordinate all training activities for those providers' personnel opting to carry autoinjector self-administration kits.
- B. Training, at a minimum, shall include:
 1. indications for self-administration
 2. injection site selection
 3. injection dosing
 4. arming the autoinjector
 5. administering the antidote (to one's self)

**ADULT MEDICATIONS:
AUTHORIZED/STANDARD INITIAL DOSE**

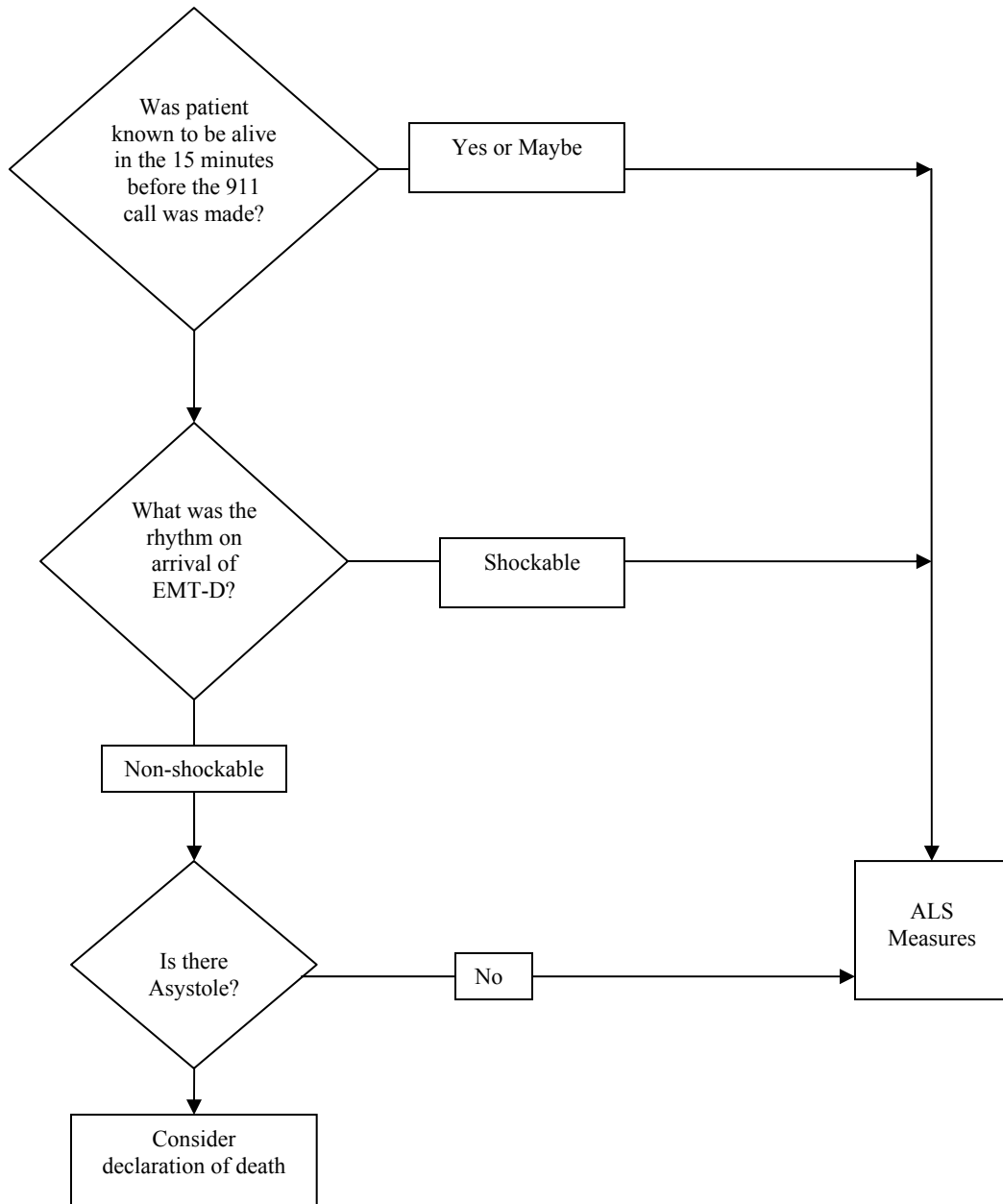
Drug	Concentration	Standard Dosage
Activated Charcoal	25 gm/bottle or 50 gm/bottle	1 gm/kg PO (not to exceed 50 Gm)
Adenosine (Adenocard)	6 mg/2cc	6mg 1 st dose, 12 mg 2 nd and 3 rd doses (rapid IVP)
Albuterol	2.5 mg/3cc NS	5mg/6cc NS
Aspirin	variable	162-325 mg PO (tablet or chewable – not enteric coated)
Atropine	1 mg/10cc	Cardiac Arrest: 1 mg (10cc) IVP or 2 mg ETT q3-5 min to max of 3 mg IV or 6 mg ETT Bradycardia: 0.5mg IVP, MR q3-5 min. to max of 2 mg Insecticide Poisoning: 2.0 mg slow IV; MR 2-5 minutes until drying of secretions
Calcium Chloride 10%	1 Gm/10 cc	1 Gm IV slowly over 5 min
Dextrose 50%	25 gms/50cc	25 Gm IVP
Diazepam (Valium)	10mg/2cc	Seizures: 5mg (1cc) IV slowly; MR x 2 q 5 min. to max. dose of 15mg and BP > 100 Cardioversion/Pacing: 0.1 mg/kg to max of 5 mg
Diphenhydramine (Benadryl)	50 mg/1cc	1 mg/kg IV / IM to max of 50 mg
Dopamine	400mg/250cc NS or 800mg/500 cc NS	5mcg/kg/min; increased to 10 mcg/kg/min if SBP <100
Epinephrine 1:1000	1 mg/1 cc Auto-Injector Epi-Pen or prefilled syringe=0.3 mg	Allergic reaction/anaphylaxis: 0.01 mg/kg SQ to max 0.5 mg (if >50 yrs give ½ dose, max 0.25 mg (0.25 cc)) or Auto-Injector Epi-Pen (MR in 5 min., Physician Consult if > 65 yrs) Cardiac Arrest : 2mg ETT (flush tube with 8cc NS) Bronchospasm/Asthma/COPD: 0.3 mg (0.3cc)SQ, MR in 5 min.
Epinephrine 1:10,000	1 mg/10 cc	Anaphylaxis: if unresponsive and no palp. BP, give 0.01 mg/kg to max of 0.5 mg (5 cc) IV Cardiac Arrest: 1 mg (10cc)IVP
Furosemide (Lasix)	variable	0.5 mg/kg IV; 1.0 mg/kg if patient normally takes Lasix
Glucagon	1 mg/1 cc	1 mg IM
Glucose Paste	30 Gm/tube	30 Gms PO

Ipratropium (Atrovent)	500 mcg in each unit dose (2.5 cc)	Unit dose
Lidocaine	100 mg/ 5 cc	Cardiac Arrest/Stable or Unstable Ventricular Tachycardia: 1-1.5 mg/kg IVP or 2-3 mg/kg ETT Intubation: consider 100 mg IV prior to attempts Symptomatic Ectopy: 1-1.5 mg/kg IVP; if ectopy continues MR with 0.5 mg/kg q 5-10 minutes to max of 3 mg/kg
Midazolam (Versed)	2 mg/cc or 10 mg/cc	Cardioversion/ Pacing: 1-2 mg slow IVP (max. dose 2mg) Seizures: 1-2 mg slow IV or deep IM, MR q 5 minutes (max. dose of 5 mg)
Morphine Sulfate	10 mg/1 cc	Chest Pain: 2-5 mg slow IVP, MR q 2-3 min. to total of 10 mg Sedation for Cardiac Pacing: 2-5 mg for pain control Pain Management: 2-5 mg slow IVP, MR prn if SBP>100 to a total dose of 15mg Trauma Patients: see specifics in adult pain management protocol Pulmonary Edema: 2-5 mg IV (<i>Physician consult</i>)
Naloxone (Narcan)	2 mg/5 cc	0.4mg-2mg IVP if narcotic OD suspected; if no IV, administer IM or SL
Neosynephrine spray	½ % solution	2 “squirts” in each nostril prior to nasotracheal intubation
Nitroglycerine	0.4 mg/tablet or spray	1 tab or spray SL; repeat q 5min. if SBP>100
Sodium Bicarbonate	50 mEq/50 cc	Crush Syndrome or known Hyperkalemia: 1 mEq/kg up to 100 mEq IVP Cyclic Antidepressant OD with significant dysrhythmias: 1mEq/kg IVP

CARDIAC EMERGENCIES

CARDIOPULMONARY ARREST C1

Algorithm



CARDIAC EMERGENCIES

CARDIOPULMONARY ARREST C1

Ventricular Fibrillation/Pulseless Ventricular Tachycardia

1. CPR First (90 seconds) - If unwitnessed & downtime > 5 minutes, or unlikely primary respiratory based situations (peds or young adults/drowning/trauma/allergic/overdose).
2. If witnessed and/or primary respiratory arrest scenario (as above), use defibrillator to check patient for a shockable rhythm (*).
Defibrillate (or biphasic equivalent)
 - a) 200 joules
 - b) 200-300 joules
 - c) 360 joules* Precordial thump by First Responder/EMT if witnessed and defibrillator not available
3. Continue CPR
4. Intubate and establish IV NS wide-open rate. Begin transport if both are not accomplished, continue treatment while transporting.
5. **Epinephrine** 1.0 mg IVP or 2.0 mg ETT
 - a) Circulate for 1 minute and defibrillate 360 joules
 - b) If no results, continue CPR
 - c) Repeat above steps every 3-5 minutes
6. **Lidocaine**
 - a) 1.0-1.5 mg/kg IVP or 3.0 mg/kg ETT
 - b) Circulate for 1 minute and defibrillate 360 joules
 - c) Repeat above every 3-5 minutes to maximum of 3.0 mg/kg (IV or equivalent ETT dose)
7. Begin transport.

- (*) CPR first has been shown to lead to better survival and neurologic outcome in presumed arrest patients of cardiac etiology. Respiratory patients can be shocked without delay (CPR).

Pulseless Electrical Activity

Definition: Includes rhythms previously known as electromechanical dissociation (EMD), idioventricular, ventricular escape and bradyasystole

Consider: hypovolemia, hypoxemia, tension pneumothorax, acidosis, cardiac tamponade, pulmonary embolism, anaphylaxis

1. Continue CPR
2. Intubate and establish IV NS wide-open rate. Begin transport if both are not accomplished, continue treatment while transporting
3. **Epinephrine** 1.0 mg IVP or 2 mg ETT
 - a. Continue CPR and evaluate in 1 minute
 - b. If no response, repeat Epinephrine every 3-5 minutes
4. **Atropine** 1.0 mg IV or 2.0 mg ETT if rate < 60, MR every 3-5 min to max of 0.04 mg/kg
5. **Sodium bicarbonate** 1.0 mEq/kg IVP if known hyperkalemia, or suspected cyclic antidepressant overdose.
6. Begin transport.

Asystole

Consider: If arrest was unwitnessed and asystole has been confirmed, criteria for field determination of death have been met according to Policy #8110

If first responders or paramedics detect a pulse that proceeds to asystole, external pacing should be instituted and treatment provided according to the asystole treatment guideline.

1. Continue CPR. If rhythm is unclear and possibly ventricular fibrillation, defibrillate as for ventricular fibrillation
2. Intubate and start IV NS wide-open rate. Begin transport if both not accomplished, continue treatment while transporting.
3. **Epinephrine** 1.0 mg IVP or 2 mg ETT
 - a. Continue CPR and evaluate in 1 minute
 - b. If no response, repeat epinephrine every 3-5 minutes.
4. **Atropine** 1.0 mg IVP or 2.0 mg ETT every 3-5 minutes to maximum of 0.04 mg/kg.
5. Death may be declared if patient has remained in asystole (documented in 2 leads for one (1) minute), without capture if on pacing, pulseless and apneic for 10 minutes of above interventions.

DYSRHYTHMIAS C2

Bradycardia

Definition: Heart rate below 50/minute that is symptomatic (decreasing perfusion, chest pain, shortness of breath, decreased level of consciousness, pulmonary congestion, CHF)

SBP > 100

1. High flow oxygen
2. Cardiac monitor
3. IV
4. Transport

SBP <100

1. High flow oxygen
2. Cardiac monitor
3. IV
4. **Atropine** 0.5 mg IV, MR every 3-5 minutes to max of 0.04mg/kg
 - a. Begin transport after first dose given
5. If hypovolemia is suspected, give fluid challenge 250 cc, may repeat
6. If no improvement following initial dose of Atropine, institute external pacing at rate of 80 and notify hospital
 - a. If patient conscious, administer **Diazepam(Valium)** 0.1 mg/kg to maximum of 5 mg IV or **Midazolam (Versed)** 2 mg. Higher dose requires receiving hospital contact.
 - b. Consider **Morphine**, up to 4 mg for pain control. Use with caution.
7. If unable to start IV or IV access is delayed, institute external pacing at rate of 80 bpm; increase in increments of 10 mA until capture obtained then increase the output level by 10%.
8. If capture maintained, but patient remains symptomatic consider increasing rate by 10 bpm to max of 100 bpm.
9. **Dopamine** 5mcg/kg/min, increase to 20 mcg/kg/min if SBP remains < 100.
10. Consider Physician Consult if patient remains symptomatic.

Ventricular Ectopy

Reminder: Considerations for acute suppressive therapy include: PVCs **only** in presence of ischemic chest pain, multifocal, couplets or runs of ventricular tachycardia; restoration of organized rhythm following conversion from VT or defibrillation

1. High flow oxygen
2. Cardiac monitor
3. IV
4. **Lidocaine**
 - a. 1.0-1.5 mg/kg IVP
 - b. If ectopy continues, 0.5 mg/kg every 5-10 minutes to max of 3.0 mg/kg

Sustained Ventricular Tachycardia Pulse Present

Stable: (awake, perfusing)

1. High flow oxygen
2. Cardiac monitor
3. IV
4. **Lidocaine** 1.0-1.5 mg/kg IVP
 - a. If VT resolves, repeat Lidocaine at 1/2 initial dose every 10 min to total of 3.0 mg/kg
 - b. If VT persists, repeat Lidocaine at 1/2 initial dose every 5 min to total of 3.0 mg/kg
5. Begin transport after initial Lidocaine dose
6. Consider synchronized cardioversion (see UNSTABLE, below)

Sustained Ventricular Tachycardia Pulse Present

Unstable: (low blood pressure, shortness of breath, chest pain, altered consciousness or CHF/pulmonary edema)

1. High flow oxygen
2. Cardiac monitor
3. IV, consider fluid challenge NS 300cc if hypotensive
4. Consider sedation with **Diazepam (Valium)** 0.1 mg/kg to maximum of 5 mg IV or **Midazolam (Versed)** 2 mg. Higher dose requires receiving hospital contact.
5. If HR > 150, synchronized cardioversion (If synchronized cardioversion not possible due to shape of QRS, perform unsynchronized cardioversion/biphasic equivalent.)
 - a. 100 joules; if unsuccessful,
 - b. 200 joules; if unsuccessful,
 - c. 300 joules; if unsuccessful,
 - d. 360 joules.
6. **Lidocaine** 1.0-1.5 mg/kg IVP or 3.0 mg/kg ETT
 - a. If VT resolves, repeat Lidocaine 1/2 initial dose every 10 min to total of 3.0 mg/kg
 - b. If VT persists, repeat Lidocaine at 1/2 initial dose every 5 min to total of 3.0 mg/kg
 - c. After full loading dose is achieved, Lidocaine 0.5 mg/kg every 10 minutes to maintain blood level
7. Transport

Supra Ventricular Tachycardia (SVT)

Definition: Rate of > 150/min, regular rhythm. Verify QRS duration of < 0.12 by documenting rhythm in two leads. If > 0.12, go to Ventricular Tachycardia protocol.

Stable (awake, perfusing)

1. Oxygen
2. Cardiac monitor
3. IV - use antecubital or more proximal site
4. Consider valsalva maneuver
5. **Adenosine (Adenocard)**
 - a. 6 mg rapid IVP followed by saline flush
 - b. If no response after 2 min: 12 mg rapid IVP followed by saline flush
 - c. If no response after 2 min: 12 mg rapid IVP followed by saline flush
6. Transport

Unstable (presence of significant chest pain, significant dyspnea, low BP, indications of low perfusion, altered level of consciousness)

1. High flow oxygen
 2. Cardiac monitor
 3. IV
 4. Consider sedation with **Diazepam (Valium)** 0.1 mg/kg to maximum of 5 mg IV or **Midazolam (Versed)** 2 mg. Higher dose requires receiving hospital contact.
 5. Synchronized cardioversion (or biphasic equivalent)
 - a. 100 joules
 - b. 200 joules
 - c. 300 joules
 - d. 360 joules
 6. Transport
- If unstable atrial fibrillation perform steps 1-3 (unstable), then contact receiving facility physician and anticipate cardioversion.

CHEST PAIN UNLIKELY TO BE OF CARDIAC ORIGIN C3

Definition: Chest pain that is, by history, location and character deemed to not be related to cardiac ischemia.

1. Consider BLS care.
2. If not BLS:
 - a. Oxygen
 - b. Cardiac Monitor
 - c. Saline lock.

CHEST PAIN/ACUTE CORONARY SYNDROME C4

INFORMATION NEEDED

- Discomfort or pain: OPQRST, Previous episodes
- Associated symptoms: Weakness, nausea, vomiting, diaphoresis, dyspnea, dizziness, palpitations, “indigestion”
- Medical history (cardiac history, other medical problems, including hypertension, diabetes or stroke)

OBJECTIVE FINDINGS

- General appearance: level of distress, skin color, diaphoresis
- Signs of CHF (peripheral edema, respiratory distress, distended neck veins)
- Lung sounds
- EKG rhythm
- Assessment of pain on a 0-10 scale

BLS Treatment	ALS Treatment
<ul style="list-style-type: none"> • Reassure patient and place in position of comfort, or supine if patient is hypotensive • Oxygen • Assess patient: primary, detailed physical assessment, and history • Assist patient with taking their own NTG if SBP > 100; repeat q 5 min. Stop if BP becomes less than or equal to 100 • RMC 	<ul style="list-style-type: none"> • High flow oxygen • IV access and cardiac monitor • NTG 0.4 mg SL, repeat q 5 min. if systolic BP > 100. (Do not give NTG if patient has taken “Viagra –like” medications in the previous 24-48 hours)* • ASA 162-325 mg PO (chew) • Morphine Sulfate 2 mg slowly IV to relieve persistent discomfort, repeat q 2-3 min. to a total of 10 mg. • Prehospital screening for thrombolytic therapy
ALS Optional Scope	Receiving Hospital Contact Criteria
<ul style="list-style-type: none"> • 12 lead EKG, if available 	<ul style="list-style-type: none"> • Additional treatment for ongoing pain when BP<100 • Transmission/verbal report of positive 12-lead EKG findings

Documentation for Adherence to Protocols:

- Presence of PQRST history
- Vital signs before/after NTG administration
- Cardiac rhythm documentation and ST↑ if using 12-lead EKG
- IV/O₂
- NTG given, unless hypotension or Viagra-like medication w/in the past 24-48 hrs.
- ASA unless allergy documented

-
- Prehospital thrombolytic screening contraindications (time permitting)

PRECAUTIONS AND COMMENTS

- Minimize scene time and notify the receiving hospital
 - IV access before NTG if systolic BP <100
 - Suspicion of Acute Coronary Syndrome (ACS) is based upon patient history. Be alert to patients likely to present with atypical symptoms or “silent AMI’s”: women, elderly and diabetics
 - Administer **Morphine** slowly IV to avoid respiratory depression and /or hypotension; be ready to support ventilations and have **Naloxone** available.
 - Consider other potential causes of chest pain: pulmonary embolus, pneumonia, aortic aneurysm and pneumothorax.
 - **NTG** is contraindicated in patients who have taken Viagra-like medications within the past 24-48 hours.
 - Encourage pre-hospital **ASA** administration even if patient has taken daily **ASA** dose.
- * Inquire about medications similar to Sildenafil (Viagra): Vardenafil (Levitra), and Tadalafil (Cialis)

PREHOSPITAL THROMBOLYTIC THERAPY CHECKLIST

Surgery within 4 weeks	Yes	No
Surgery involving central nervous system within 6 months	Yes	No
Stroke or transient ischemic attack within 6 months	Yes	No
Major trauma within 4 weeks	Yes	No
Intracranial tumor, bleed, AV malformation or aneurysm	Yes	No
Bleeding ulcer or gastrointestinal bleed	Yes	No
Bleeding disorder	Yes	No
Liver disease	Yes	No
Kidney disease	Yes	No
Diabetes-related eye disease	Yes	No
Childbirth within 6 weeks	Yes	No
Streptokinase therapy within 6 months	Yes	No

MEDICAL EMERGENCIES

NON-TRAUMATIC SHOCK M1

Definition: Signs and symptoms of shock with dry lungs, flat neck veins; may have poor skin turgor, vomiting, diarrhea, possible sepsis.

Reminder: Refer to the following specific protocols if applicable: GI bleeding, anaphylaxis, tension pneumothorax, trauma, vaginal hemorrhage, pulmonary edema.

1. Ensure patent airway
2. High flow oxygen; prepare to support ventilations with appropriate airway adjuncts
3. Shock position if tolerated, keep patient warm
4. Cardiac monitor; treat dysrhythmias per specific treatment guideline
5. IV NS, large bore, started en route, 250-500 cc challenge, recheck vital signs. If no response after initial fluid challenge, start second large bore IV.
6. If hypotension persists give second fluid challenge.
7. If hypotension persists consider physician order for **Dopamine**.

ABDOMINAL PAIN M2

Definition: Moderately severe to severe pain, restless, unable to find position of comfort or signs of shock

Reminder: Consider ectopic pregnancy, aneurysm

1. Ensure patent airway
2. High flow oxygen; prepare to support ventilations with appropriate airway adjuncts
3. Shock position if tolerated, keep patient warm
4. Cardiac monitor; treat dysrhythmias per specific treatment guideline
5. Consider early rapid transport
6. If SBP > 100, IV NS TKO
7. If SBP < 100, two large bore IVs NS, started en route; fluid challenge, recheck vital signs every 250 cc

GASTROINTESTINAL BLEEDING M3

Definition: History of dark, tarry stools or vomiting blood; may or may not have abdominal pain

1. Ensure patent airway
2. Large bore IV NS TKO; fluid challenge if abnormal vital signs, recheck vital signs every 250 cc
3. If in shock:
 - a. High flow oxygen; prepare to support ventilations with appropriate airway adjuncts
 - b. Shock position if tolerated, keep patient warm
 - c. Cardiac monitor; treat dysrhythmias per specific treatment guideline
 - d. Consider early rapid transport
 - e. Start second large bore IV en route; fluid challenge, recheck vital signs every 250 cc

ALLERGIC REACTION AND ANAPHYLAXIS M4

INFORMATION NEEDED

- Exposure to common allergens (stings, drugs, nuts, seafood, meds), prior allergic reactions
- Respiratory: wheezing, stridor, respiratory distress
- Skin: itching, hives, rash
- Other symptoms: nausea, weakness, anxiety

OBJECTIVE FINDINGS

<u>MILD</u>	<u>MODERATE</u>	<u>SEVERE (ANAPHYLACTIC SHOCK)</u>
<ul style="list-style-type: none"> • Hives, rash 	<ul style="list-style-type: none"> • Hives, rash • Mild bronchospasm/wheezes • Normotensive 	<ul style="list-style-type: none"> • Altered mental status • Hypotension (SBP < 100 & evidence of hypoperfusion) • Bronchospasm ± angioedema

BLS TREATMENT

<ul style="list-style-type: none"> • Remove etiologic agent if possible or relocate patient • Ensure patent airway, Administer O₂ • For severe allergic reaction/anaphylaxis/wheezing, Auto-Injector Epi-Pen SQ (or pre-filled syringe)*; MR in 5 min. <p>➤ <i>Only EMTs trained in Auto-Injector Epi- Pen may perform this procedure (2 hrs per State Protocol)</i></p>

ALS TREATMENT

<u>Mild</u>	<u>Moderate</u>	<u>Severe (Anaphylaxis)</u>
<ul style="list-style-type: none"> • Pulse Oximetry • Cardiac monitor • Benadryl 50 mg IM 	<ul style="list-style-type: none"> • Pulse Oximetry • Cardiac monitor • IV • Benadryl 50 mg IV/IM • Epinephrine 1:1000 SQ 0.01 mg/kg, max 0.5 mg (if >50 yrs give ½ dose, max 0.25mg) • Resp. Symptoms: Albuterol 5 mg/6cc NS via HHN, repeat if indicated 	<ul style="list-style-type: none"> • Pulse Oximetry • Cardiac monitor - treat dysrhythmias per specific guidelines • High flow O₂; advanced airway prn • Epinephrine 1:1000 SQ 0.01 mg/kg (max.0.5mg) • Large bore IV & fluid challenge 250 cc; MR • If unresponsive/no palpable BP, give Epinephrine (1:10,000) 0.01 mg/kg IVP* (max of .5 mg) • Albuterol 5mg/6cc NS via HHN, repeat if indicated • Benadryl 50 mg IV/IM • If hypotension persists after two fluid challenges, begin Dopamine infusion at 10 mcg/kg/min

Physician Consult Criteria:

***Epinephrine IV (EMT-P)** for patients over 50 years of age, or with known history of CAD/HTN.

Documentation for adherence to protocol:

- Oxygen given
- Correct dosages of medications if administered
- Level of distress (mild, moderate, severe) and associated respiratory distress findings

PRECAUTIONS AND COMMENTS:

- Epinephrine may cause anxiety, tremors, palpitations, tachycardia, and headache. In the elderly, epinephrine may precipitate AMI, hypertensive crisis, and dysrhythmias.
- Be sure you are giving the proper dilution and dose of Epinephrine to your patient.
- Edema of any of the soft structures of the upper airway may be lethal. Frequently assess and be prepared for early intubation before swelling precludes this intervention.
- Only EMTs trained (per State Regulations) in Auto-Injector Epi-Pen administration may perform this procedure

POISONS/DRUGS M5

**Toxic ingestions and exposures
Basic Therapy**

1. Ensure patent airway, prepare to support ventilations with appropriate airway adjuncts
2. Obtain history, including substance, amount and time of ingestion, bring sample to hospital if possible
3. Cardiac monitor
4. IV NS TKO if indicated
5. Transport as soon as possible

Hydrocarbons or Petroleum Distillates

Definition: kerosene, gasoline, lighter fluid, turpentine, furniture polish, etc.

1. Basic therapy
2. DO NOT INDUCE VOMITING
3. Transport immediately

Caustics/Corrosives

Definition: Ingestion of substances causing intra-oral burns, painful swallowing or inability to handle secretions

1. Basic therapy
2. DO NOT INDUCE VOMITING
3. Consider dilution with no more than 1-2 glasses of water or milk if no respiratory compromise or change in mental status

Insecticides

Definition: organophosphates, carbonates; cause cholinergic crises characterized by bradycardia, increased salivation, lacrimation and sweating, muscle fasciculations, abdominal cramping, pinpoint pupils, incoherence or coma.

1. If skin exposure, decontaminate patient--remove clothes, wash skin; avoid contamination of prehospital personnel
2. Basic Therapy
3. **Atropine** 2.0 mg IV slowly. Repeat every 2-5 minutes until drying of secretions, reversal of bronchospasm and reversal of bradycardia. Maximum is 10 mg
4. If seizures, **Valium** 5 mg IV slowly
5. If seizures continues and BP >100, may repeat x 2 q 5 min. (max. total 15 mg)

Cyclic Antidepressants

Definition: Specific medications frequently associated with respiratory depression, almost always tachycardic. Widened QRS and ventricular arrhythmias generally indicate life-threatening ingestions

1. Basic therapy
2. Anticipate rapid deterioration of condition
3. In the presence of life-threatening dysrhythmias (hemodynamically significant supraventricular rhythms, ventricular dysrhythmias or QRS > 0.10)
 - a. Hyperventilate if assisting ventilations or if intubated
 - b. **Sodium bicarbonate** 1 mEq/kg IVP
4. For seizures, **Valium** 5 mg IV slowly
5. If seizures continue and BP >100, may repeat x 2 q 5 min. (max. total 15 mg)

Phenothiazine Reactions

Definition: Restlessness, muscle spasms of the neck, jaw, and back; oculogyric crisis; history of ingestion of phenothiazine (or unknown medication)

1. Basic therapy
2. Reassurance
3. **Benadryl** 1 mg/kg slow IVP to max of 50 mg

Other Non-Caustic Drugs Patient awake and alert

1. Basic therapy
2. **Activated charcoal** 1 Gm/kg po, not to exceed 50 Gm.
3. If level of consciousness diminishes, protect airway, suggest lateral position with head down

AIRWAY OBSTRUCTION R1

Definition: Mechanical upper airway obstruction with history of food aspiration (especially if elderly), alcohol abuse, child playing with small toys

Conscious patient-able to speak

1. Offer reassurance; intervention is usually not necessary
2. Encourage coughing
3. Offer oxygen via cannula
4. Cardiac monitor
5. Suctioning if needed to control secretions
6. Begin transport; avoid agitating patient

Conscious patient-unable to cough or speak

1. Ask the patient if he/she is choking
2. Administer abdominal thrusts/Heimlich maneuver until the foreign body is expelled or the patient becomes unconscious
3. After obstruction is relieved, reassess airway, lung sounds, skin color and vital signs
4. Oxygen therapy as indicated by clinical condition
5. Cardiac monitor

Unconscious Patient

1. Perform a tongue-jaw lift followed by finger sweep to remove object
2. Open airway and try to ventilate
3. Administer abdominal thrusts and follow as above

EPIGLOTTITIS R2

Definition: Presence of upper respiratory infection, sore throat, fever, stridor or drooling

1. High flow oxygen; allow parent to administer if appropriate
2. Transport
3. If patient deteriorates or becomes completely obstructed, attempt positive pressure ventilation via BVM. Endotracheal intubation should be performed **only** if BVM is inadequate.

BRONCHOSPASM / ASTHMA / COPD R3

INFORMATION REQUIRED

- History: Previous episodes, hospitalizations, and intubations, fever, sputum production, medications (bronchodilators/steroids), exposure (allergens, toxins, fire/smoke), trauma
- Symptoms: chest pain, shortness of breath

OBJECTIVE FINDINGS

<u>MILD</u>	<u>MODERATE</u>	<u>SEVERE</u>
<ul style="list-style-type: none"> ▪ Alert ▪ Dyspnea ▪ Mild wheeze ▪ Speaking full sentences 	<ul style="list-style-type: none"> ▪ Moderate wheeze ▪ Moderate dyspnea ▪ Accessory muscle use ▪ Limited speaking ▪ Mild - Mod. desaturation 	<ul style="list-style-type: none"> ▪ Altered mental status ▪ Minimal air movement ▪ Inability to speak ▪ Cyanosis ▪ Significant. Desaturation (<85%) ▪ Increasing ETCO₂ (>40)

BLS TREATMENT

- Ensure patent airway, Administer O₂
- BVM, suction prn
- For severe asthma, administer **Auto Injector Epi-Pen** (or preloaded syringe). Only EMTs with epinephrine administration training may perform this (2 hrs per State protocol)

ALS TREATMENT

<u>MILD</u>	<u>MODERATE</u>	<u>SEVERE</u>
<ul style="list-style-type: none"> ▪ Albuterol 5 mg in 6 cc NS nebulizer, repeat if indicated 	<ul style="list-style-type: none"> ▪ IV ▪ Cardiac monitor ▪ Albuterol ▪ Ipratropium 500 mcg. (2.5cc) nebulizer or via BVM ▪ If bronchospasm worsens, consider Epinephrine(1:1000) 0.3 mg (0.3c) SQ, may repeat in 5 min. 	<ul style="list-style-type: none"> ▪ IV ▪ Cardiac monitor ▪ Albuterol ▪ Ipratropium ▪ Epinephrine (1:1000) 0.3 mg (0.3cc) SQ, may repeat in 5 min. ▪ Fluid challenge ▪ Advanced airway prn

Documentation for Adherence to Protocol:

- Physical finding of wheezing, decreased lung sounds
- Administration of oxygen, O₂ saturation
- Administration of Albuterol, Ipratropium, Epinephrine, Auto-Injector Epi-Pen
- IV placement in moderate/severe distress

PRECAUTIONS AND COMMENTS

- Supplemental oxygen should not be withheld in COPD or chronic upper airway obstruction, but O₂ may decrease respiratory rate in these individuals
- Withhold repeat dosing Albuterol / Ipratropium (Atrovent) if significant tachycardia or chest pain
- Epinephrine may cause: anxiety, tremor, palpitation, tachycardia, hypertension and headache. In elderly patients, epinephrine administration may precipitate AMI, hypertensive crisis, intracranial hemorrhage and /or dysrhythmias
- Only EMTs with epinephrine administration training may perform this emergency treatment

ACUTE PULMONARY EDEMA R4

Definition: Acute onset of respiratory difficulty; may have history of cardiac disease, rales, occasional wheezes

1. 100% oxygen/NRB mask; consider ventilatory assist with appropriate airway adjuncts
2. Position of comfort, suggest sitting
3. Cardiac monitor
4. IV
5. **If SBP < 100**
 - a. Begin Transport
 - b. Hospital contact
 - c. Consider NS 250cc IV fluid challenge`
 - d. **Dopamine** 400mcg/250 NS (or premix), begin infusion at 5 mcg/kg/min, and increase to 10 mcg/kg/min, if BP <100. Monitor BP q 3-5 min
6. **If SBP > 100**
 - a. **Nitroglycerin** 0.4 mg SL, MR every 5 min if needed.
(Do not give nitroglycerin if patient has taken “Viagra-like” medication* within the previous 24-48 hours)
 - b. **Lasix** 0.5 mg/kg IV; 1.0 mg/kg IV if patient normally takes Lasix
 - c. Consider early transport
 - d. If no response, consider physician consult for **Morphine** 2-5 mg IV

* Examples of “Viagra-like” medications (PDE-Inhibitors) include: Sildenafil (Viagra), Vardenafil (Levitra), and Tadalafil (Cialis).

ACUTE RESPIRATORY DISTRESS-OTHER R5

Definition: Increased respiratory rate, sensation of difficulty breathing not clearly due to the clinical entities specified in other guidelines. Symptoms may be due to pneumonia, inhalation of toxic substances, pulmonary embolus.

1. Position of comfort
2. Ventilatory support with appropriate airway adjuncts
3. Cardiac monitor
4. IV

PNEUMOTHORAX R6

Simple Pneumothorax

Definition: Normotensive, absent or diminished breath sounds on one side with no tracheal deviation or distended neck veins

1. High flow oxygen. Ventilatory support with appropriate airway adjuncts
2. Cardiac monitor
3. Rapid transport
4. IV
5. Continuous monitoring for signs of tension pneumothorax

Tension Pneumothorax

Definition: Absent or diminished breath sounds on one side with a combination of falling blood pressure, O₂ desaturation, cyanosis, distended neck veins, hyper-resonance on side without breath sounds with tracheal deviation to the other side

1. High flow oxygen. Ventilatory support with appropriate airway adjuncts
2. Needle thoracostomy on affected side (**only for patients in extremis**)
3. Cardiac monitor
4. IV
5. Urgent transport

TOXIC GAS INHALATION R7

Definition: Respiratory distress caused by inhalation of toxic gases by history. Suspect carbon monoxide in cases of exposure to fire in an enclosed space, symptoms of headache, dizziness which may be associated with cherry-red color of mucous membranes (late sign)

1. Rapid Removal of patient from toxic environment with attention to safety of rescue personnel
2. High flow oxygen
3. Cardiac monitor
4. IV
5. If wheezing - bronchodilator therapy, **Albuterol** 5 mg in 6 cc NS via nebulizer, repeat as indicated

RESPIRATORY ARREST R8

Definition: Absence of spontaneous ventilations without cardiac arrest. Consider narcotic overdose.

1. Ventilation with 100% oxygen. Be prepared to support ventilations with appropriate airway adjuncts
2. Cardiac monitor
3. IV NS TKO
4. **Narcan** 0.4mg-2.0 mg IV/IM/SL if narcotic overdose is suspected
5. Oral intubation if no response to Narcan
6. Rapid transport

NEUROLOGICAL EMERGENCIES

COMA/ALTERED LEVEL OF CONSCIOUSNESS N1

Definition: Glasgow Coma Scale less than 15, etiology unclear (consider AEIOU TIPS); sudden onset of weakness, paralysis, confusion, speech disturbances, may be associated with headache

Reminders: Consider indication for C-spine precautions; consider diabetes-related complications. Consider Stroke protocol (N4)

1. Position patient with head elevated 30 degrees or left lateral recumbent if vomiting.
2. High flow oxygen. Be prepared to support ventilations with appropriate airway adjuncts.
3. Cardiac Monitor
4. IV NS TKO
5. Blood glucose reading
 - a. If BS < 70 or immeasurable, **Dextrose 50% 50 cc IVP**
 - b. If BS < 70 or immeasurable and unable to start IV, **Glucagon 1 mg IM/SQ**
6. **Narcan 0.4mg-2 mg IVP** if narcotic overdose suspected. If unable to start IV, give Narcan IM

SEIZURES N2

INFORMATION NEEDED

- Number, description, duration of seizures
- Medical history (seizure history; other medical problems including diabetes, stroke, trauma, alcoholism, recent illness, allergies)
- Medications, drugs

OBJECTIVE FINDINGS

- Unusual odor or drugs; needles on scene, track marks
- Specific level of consciousness, neurological status
- Signs of trauma
- Breath odor
- Medic Alert tag
- Blood glucose level

BLS Treatment	ALS Treatment
<ul style="list-style-type: none">• RMC• Oxygen• C-spine immobilization if any suspicion of head trauma• Comfort and reassure patient if conscious• Restrain only as necessary for patient and provider protection• Transport in left lateral recumbent position if no C-spine injury is suspected• Cooling measures if patient febrile	<ul style="list-style-type: none">• IV• Cardiac monitor• Dextrose 50% (D₅₀W) 50cc IVP if blood glucose <70mg/dl or if patient is known diabetic. If unable to establish IV, give Glucagon 1 mg IM or SQ• Narcan 2 mg IV/IM if opiate OD is suspected, and the patient is in respiratory failure or shock• Valium (Diazepam) 5 mg IV slowly; MR x 2 q 5 min to max. dose of 15 mg total and SBP >100. <p style="text-align: center;">OR</p> <ul style="list-style-type: none">• Midazolam (Versed) 1-2 mg slow IV or IM; MR in 5 minutes (total max. dose not to exceed 5 mg)• Advanced airway management as indicated

Documentation for adherence to protocol:

Blood glucose level check performed
Number, description, and duration of seizures
Correct dosages of medications if administered

PRECAUTIONS AND COMMENTS

- Always consider treatable etiologies (hypoglycemia, hypoxia, narcotic overdose) prior to administering antiseizure medications
- Midazolam (Versed) is the drug of choice if unable to establish IV
- Be attentive for excessive oral secretions, vomiting, and inadequate tidal volume
- Treatment should be based on the severity and length of the seizure activity
- Focal seizures without mental status changes may not require prehospital pharmacological intervention.
- Never administer Midazolam (Versed) rapid IVP – cardiac/respiratory arrest may occur

SYNCOPE/NEAR SYNCOPE N3

Definition: Episode of brief loss of consciousness, dizziness; often postural

Reminders: Evaluate cardiac rhythm, precipitating factors, associated symptoms, medical history/medications; if abnormal vital signs or loss of consciousness, do not do postural vital signs.

1. Ensure patent airway
2. Cardiac monitor – treat dysrhythmias per specific treatment guideline
3. Supine position
4. IV NS TKO or saline lock; 300 cc fluid challenge if hypotensive or tachycardic
5. Blood glucose reading
 - a. If BS < 70 or immeasurable, **Dextrose 50% 50 cc IVP**
 - b. If BS < 70 or immeasurable and unable to start IV, **Glucagon 1 mg IM/SQ**

CEREBROVASCULAR ACCIDENT (STROKE) N4

Definition: ALOC/Positive findings per the CPSS stroke assessment tool* (see below)

1. High flow oxygen. Be prepared to support ventilations with appropriate airway adjuncts
2. Cardiac Monitor
3. Assess patient for the following:
 - a. Evidence of hemispheric stroke per the CPSS stroke tool
 - b. Last known normal less than 2 hours
 - c. Blood glucose between 70 and 400
4. Assess patient for the absence of the following:
 - a. Severe obtundation
 - b. History of intercranial hemorrhage
 - c. Serious head injury within 2 months
 - d. Seizure within 6 hours of last known normal
 - e. Taking blood thinning medication (e.g. Warfarin/Coumadin)
 - f. Improving neurological deficit
5. If patient meets above criteria:
 - a. Rapid transport to closest facility with operating CT scanner
 - b. IV NS TKO
 - c. Early stroke notification:
 - * “Stroke Notification”
 - * Unit ID and ETA
 - * Patient name, age, DOB, PMD, and medical record number if available
 - * Time of last known normal

***Cincinnati Prehospital Stroke Scale (CPSS)**

The patient is considered a possible “Stroke Notification” candidate if any of the tested signs/symptoms (below) are abnormal.

The patient may be a candidate for emergent intervention (thrombolysis, etc.) if:

1. Any of the tested signs and symptoms below are abnormal; or
2. Signs and symptoms began within 2-3 hours of contact.

Facial Droop (the patient shows teeth or smiles)

___ Normal: both sides of the face move equally

___ Abnormal: Right side of the face does not move as well as the left

___ Abnormal: Left side of the face does not move as well as the right

Arm Drift (the patient closes their eyes and extends both arms straight out for 10 seconds)

___ Normal: both arms move the same, or both arms do not move at all

___ Abnormal: Right arm either does not move, or drifts down compared to the left

___ Abnormal: Left arm either does not move, or drifts down compared to the right

Speech (the patient repeats “The sky is blue in Cincinnati.” or other sentence)

___ Normal: the patient says the correct words with no slurring of words

___ Abnormal: the patient slurs words, says the wrong words, or is unable to speak

AMBULANCE SUPPLY/EQUIPMENT REQUIREMENTS

I. PURPOSE

To establish minimum requirements for ambulance vehicles, equipment and supplies.

II. AUTHORITY

- A. California Administrative Code, Title 13, Chapter 2
- B. California Emergency Medical Services Authority
- C. Marin County Ambulance Ordinance

III. POLICY

- A. Vehicles
 - 1. Ambulance vehicles shall meet all standards specified in the California Administrative Code, including the possession of a valid emergency vehicle permit issued by the California Highway Patrol.
 - 2. Vehicles will be maintained cleanly and in good mechanical and body condition at all times.
 - 3. All ambulances will have adequate space in the patient care compartment as described in the Ambulance Ordinance, Appendix D.
 - 4. Equipment to enable communication with the County Communications Center, provider dispatcher and receiving hospital will be carried as follows:
 - a. All medical transport units will carry Marin MERA radios
 - b. Non-fire service units must have a company dispatch radio
 - c. Cell phones are optional and desired for triple redundant communications
- B. Safety Equipment: Safety Equipment to be carried on ambulances and maintained in good working order shall include all items listed in the California Administrative Code and recommended by the Emergency Medical Services Authority. Items recommended by the Authority are listed below:

1. Seat Belts - Two in rear compartment (one on bench)
 2. Heating and Air Conditioning in both the front and rear compartments
 3. Marin County map current within last two years
 4. Fire extinguisher with current annual inspection
- C. Emergency Care Equipment and Supplies: Ambulances will carry all items listed in the California Administrative Code, those recommended by the Emergency Medical Services Authority, and those required by the County of Marin. See Appendix A.
- D. If staffed at an ALS level, ambulances must, in addition, carry drugs, solutions and equipment as listed in Appendix B.
- E. If staffed at a Critical Care Transport level, ambulances must, in addition, carry drugs, solutions and equipment as listed in Appendix C.

APPENDIX A

BLS MINIMUM EQUIPMENT LIST

<i>Items</i>		<i>Quantity</i>
Airways:		
*	Oropharyngeal (sizes □ 0, □ 1, □ 2, □ 3, □ 4, □ 5, □ 6)	2 each
	Nasopharyngeal (sizes □ 20, □ 22, □ 24, □ 26, □ 28, □ 30, □ 32, □ 34, □ 36 F)	2 each
Oxygen Equipment and Supplies:		
	Face masks for O ₂ administration	
*	Adult	2
*	Child	2
*	Infant	2
*	Nasal cannula for O ₂ administration	4
*	Fixed oxygen tank in vehicle, with regulator (M-tank of equivalent)	1
*	Portable oxygen tank, with regulator (min. 20 minutes @10 LPM)	1
Resuscitation Equipment and Supplies:		
	CPR Backboard – or long board	1
*	Resuscitation bag-valve mask (BVM) -adult	1
	Resuscitation bag-valve mask (BVM- child	1
	Resuscitation bag-valve mask (BVM) –infant	1
	Face masks for BVM:	
*	Adult	1
*	Child	1
*	Infant	1
Suction Equipment and Supplies:		
*	Suction apparatus, battery powered portable (squeeze syringes alone are not sufficient)	1
*	Pharyngeal tonsil tip (rigid)	2
	Suction catheters: □ 8 FR*, □ 10 FR*, □ 14 FR*	2 each
Irrigation Equipment and Supplies:		
*	Tubing for irrigation	1
*	Saline (sterile) 1,000cc	2
*	Water (sterile) 1,000cc	2
Bandages and Supplies:		
*	3 x 3 or 4 x 4 inch, sterile gauze pads	12
*	2 inch, 3 inch, 4 inch, or 6 inch rolled (Kerlix or kling) bandages	6
	40 inch, triangular bandages with Safety Pins	4
*	10 x 30 inch, universal dressing	2
*	1 inch, 2 inch, or 3 inch, adhesive tape	2 rolls
*	Bandage shears (must be in the unit)	1
	Petroleum (Vaseline) based gauze	4
	Elastic (Ace) bandage	2
	Burn Sheets (sterile) or commercial burn kit	2
	Cold packs	4
*	Obstetrical (OB) kit (sterile)- Must include: umbilical cord clamps, sterile scissors, aspirating bulb syringe, gloves; drapes, dressing, towels, clean plastic bag, <i>infant stockinet cap</i> .	1

<i>Items</i>		<i>Quantity</i>
Blood Pressure Cuffs with Manometers/Portable:		
*	Adult	1
*	Large arm/ thigh (obese)	1
*	Pediatric/Child	1
*	Infant	1
*	Stethoscope	1
Immobilization and Restraint Devices:		
*	60 inches long with adequate strapping with 4 straps	2
*	30 inches long with adequate strapping with 2 straps (KED o.k.)	1
*	Sandbags: (or equivalent material to restrict movement)	2pr
*	Cervical Collars/ hard (sizes to fit all patients more than 1 year of age)	2 each
*	Splints: (wire ladder, inflatable or cardboard) short, medium, long	4 each
*	Adult traction splint half-ring (Hare/Sager) leg splint	1
*	Pediatric traction splint	1
*	Leather or soft restraints/ ankle & wrist (1set or 2 pair)	1 set
Stretchers:		
*	Ambulance gurney (capable of elevating head and adjustable to several levels)	1
*	Collapsible stretcher with straps	1
	Scoop stretcher with straps	1
Linen:		
*	Pillows	2
*	Sheets	4
*	Pillow cases	4
*	Blankets	4
*	Towels	4
Other Items:		
	Glucose preparation for BLS use	2 doses
*	Commercially packed universal precaution kits or:	4 sets
	Disposable Masks	4
	Goggles	4
	Barrier Gowns	4
	Disposable Gloves:	
	Large	1 box
	Medium	1 box
	Small (if needed for your personnel)	1 box
	Disposable large plastic trash bags	3
*	Covered waste container (approximate size of 3# coffee can)	1
	Emesis basins	4
*	Bedpan/ fracture pan	1
*	Covered urinal	1

General Equipment:		
*	Potable water in a covered secure container	1 gal. total
	Triage tags	20
	Current Marin County EMS Patient Care Manual	1
*	Marin County Map (current within 2 years)	1
*	Battery operated flashlight	1
	30 minute road flares or approved equivalent	6
*	Fire Extinguisher (must be inspected yearly)	1
*	Spare Wheel and Tire	1
*	Siren	
*	Emergency Lighting	
*	Front seat belts	2
*	Rear seat belts (one on bench)	2
*	Front heat & air conditioning	
*	Rear heat & air conditioning	
*	Patient compartment door latches operable from inside and outside	
Radio Equipment:		
*	County VHF Medical Net Radio (required on all medical transport units)	
	County UHF Paramedic Radio (required on all ALS units)	
	Cellular telephone (not required)	
	ALS/BLS Fire service units ("Fire" band radio)	
*	Private Company - (2 way radio with company dispatch)	

- *Required by State of California Highway Patrol or recommended by the State EMS Authority

**APPENDIX B
 ALS MINIMUM DRUG, SOLUTION AND EQUIPMENT LIST**

IN ADDITION TO ITEMS LISTED IN APPENDIX A, units staffed to an ALS level must have the following medications (preferably in preloaded unit doses) solutions, and equipment available in the unit.

Drug	Preparation	Total
Activated Charcoal	25 or 50 Gm/bottle	100 Gm
Adenosine	6 mg/2cc	60 mg
Albuterol	2.5 mg/3cc NS	8 doses
Aspirin	81 mg chewable tabs	1 bottle
Atropine	1 mg/10cc	10 mg
Calcium Chloride 10%	1 Gm/10 cc	1 Gm
Dextrose 25%	2.5 Gm/10 cc	10 Gm
Dextrose 50%	25 Gms/50cc	100 Gm
Diazepam (Valium)	10mg/2cc	20 mg
Diphenhydramine (Benadryl)	50 mg/1cc or 50 mg/ 10cc	100 mg
Dopamine	400 mg	800 mg
Epinephrine 1:1000	1 mg/1 cc	4 mg
Epinephrine 1:1000 Auto-Injector Adult/Pediatric (new)	0.3 mg / 0.15 mg	2 Adult injectors / 2 Peds injectors
Epinephrine 1:10,000	1 mg/10 cc	4 mg
Furosemide (Lasix)	40 mg/unit dose	120 mg
Glucagon	1 mg/1 cc	2 mg
Ipratropium (Atrovent)	500 mcg in each unit dose	4 Unit dose
Lidocaine	100 mg/ 10 cc 2% jelly	300 mg 1 tube
Midazolam (Versed)	2 mg/cc or 10 mg/cc	10 mg
Morphine Sulfate	10 mg/10 cc	30 mg
Nalaxone (Narcan)	2 mg/5 cc	4 mg
Neosynephrine spray	½ % solution	1 bottle
Nitroglycerine	0.4 mg/tablet or spray	1 bottle
Sodium bicarbonate	50 mEq/50 cc	100 mEq

IV Solutions & Equipment	Dosage/ Size	Amount
0.9% Normal Saline	250 cc bag	2
	1000 cc bag	8
	10 cc vials	2
IV tubing	60 gtt/cc	2
IV tubing	20 gtt/cc	8
IV tubing	Pediatric microdrip (in-line volume controller)	2
IV catheters	14,16,18,20,22,24	4 ea.
IV extension tubing	any length	8
Syringes (1cc, 10/12 cc) with needles	assorted types/sizes	3 ea.
IV pressure bag		1
Saline locks		2
IO needles		2

Equipment	Amount
Combi-tube Adult	1
Combi-tube Small Adult	1
EOA	optional
Laryngoscope handle (battery powered)	1
extra batteries	2
Extra bulbs	2
Laryngoscope blades – curved 0, 1, 2, 3, 4	1 each
straight 0, 1, 2, 3, 4	1 each
Magill Forceps, adult	1
Magill Forceps, pediatric	1
Endotracheal tubes - 5.0, 6.0, 7.0, 8.0 (cuffed) 2.5, 3.0,3.5, 4.0, 4.5 (uncuffed)	2 each
appropriately sized stylettes	
Lubricating jelly	
Endojets	2
Portable, battery powered cardiac monitor with defibrillator/pacing	1
pediatric defibrillation equipment	1 set
Conductive gel or pads	
ECG electrodes	1 box
Hand held nebulizer for inhalation	2
Capnometer	2
Pleural Decompression kit	1
Broselow Pediatric tape	1
Automatic blood glucose monitoring machine approved for field use	1
TubeChek-B device	1
Cric Kit (Oxygen insufflation device, 14 g. 2 ¹ / ₄ “ angio, 10 cc syringe)	1
Pulse Oximeter	1

APPENDIX C

CRITICAL CARE TRANSPORT DRUG, SOLUTION AND EQUIPMENT LIST

IN ADDITION TO ITEMS LISTED IN APPENDIX A AND APPENDIX B, units staffed to perform critical care transports must include the following:

1. A minimum of two personnel, appropriate to individual patient care needs (refer to Interfacility Transfer policy # 8107) must be available to attend the patient.
2. All transports must occur in accordance with federal and local laws, including the Consolidated Omnibus Budget Reconciliation Act (COBRA) and its amendments (OBRA).
3. Communication equipment must be present that will allow contact between the transporting vehicle and the transferring and receiving hospitals.
4. The following equipment is recommended by the Guidelines Committee of the American College of Critical Care Medicine; the Society of Critical Care Medicine and American Association of Critical-care Nurses Transfer Guidelines Task Force and is hereby required for use in Marin County (equipment included in the BLS or ALS equipment lists is not re-listed here).

Airway equipment 50 ml flex tube with patient adapter Infant med. concentration mask with tubing Booted hemostat Heimlich valve Scalpel with blade for cricothyrotomy Positive end-expiratory pressure valve Pressure gauge with airway adapter tubing and test lung
Armboards
Arterial line tubing and monitoring equipment
Butterfly needles, pediatric sizes
Irrigating syringes
Infant, pediatric electrodes
Infusion pumps
IV Administration sets 3-way stopcocks with extensions Pedi-drip sets Blood tubing
IV catheters up to 24 ga.
IV solutions 1000 Lactated Ringers solution 250 cc D5/W
Kelly clamp
Pulse oximeter
Salem sumps (asst. sizes)

If appropriate for patient
external pacer
neonatal isolette
transport ventilator

5. The following medications are recommended by the Guidelines Committee of the American College of Critical Care Medicine; the Society of Critical Care Medicine and American Association of Critical-Care Nurses Transfer Guidelines Task Force and is hereby required for use in Marin County (medications included in the ALS medication list is not re-listed here).

Aminophylline	Nitroglycerin for IV use
Cetecaine Spray	Nitroprusside
Dexamethasone	Phenytoin
Digoxin	Potassium Chloride
Heparin	Procainamide
Mannitol	Propranolol
Magnesium	Verapamil

6. Equipment and medications shall be additionally tailored to meet all anticipated needs of the individual patient being transported.

Pediatric "Normals" Chart

Pediatric Glasgow Coma Scale

APGAR Scoring Chart

Primary Survey

Pediatric Cardiac Arrest P1

Neonatal Resuscitation P2

Pediatric Respiratory Distress P3

Pediatric Bradycardia P4

Pediatric Tachycardia Adequate Perfusion P5a

Pediatric Tachycardia Poor Perfusion P5b

Pediatric Shock P6

Pediatric Allergic Reaction P7

Pediatric Seizure P8

Pediatric Altered Level of Consciousness P9

Pediatric Toxic Exposures P10

Pediatric Burns P11

Pediatric Trauma P12

Apparent Life Threatening Event (ALTE) P13

PEDIATRIC “NORMALS” CHART

	Kg/lb	Minimum Systolic BP	Normal Heart Rates	Normal Resp. Rates	ET Tube Size	Fluid Challenge (cc)
Premature	<2.5/5.5	40	120-170	40-60	2.5-3.0	<50
Term	3.5/7.7	50	100-170	40-60	3.0-3.5	70
3 months	6/13.2	50	100-170	30-50	3.5	120
6 months	8/17.6	60	100-170	30-50	4.0	160
1 year	10/22	65	100-170	30-40	4.0	200
2 years	13/28.6	65	100-160	20-30	4.5	260
4 years	15/33	70	80-130	20	5.0	660
6 years	20/44	75	70-115	16	5.5	880
8 years	25/55	80	70-110	16	6.0	1100
10 years	30/66	85	60-105	16	6.5	1320
12 years	40/88	90	60-100	16	7.0	1760

PEDIATRIC GLASGOW COMA SCALE

(for use in children 2 years of age and under)

Eye opening

- (4) spontaneous
- (3) to speech
- (2) to pain
- (1) none

Verbal Response

- (5) coos, babbles
- (4) irritable cry
- (3) cries to pain
- (2) moans to pain
- (1) none

Motor Response

- (6) normal spontaneous movement
- (5) withdraws to touch
- (4) withdraws to pain
- (3) abnormal flexion
- (2) abnormal extension
- (1) none

APGAR SCORING CHART

	0	1	2
Appearance	Blue-pale	Body pink, limbs blue	Pink all over
Pulse	None	< 100	> 100
Grimace	No response	Grimace	Cough, cry, sneeze
Activity	Flaccid	Some flexion	Active movement
Respiratory effort	Absent	Slow, irregular	Strongly drying

Check APGAR score at 5 minutes and every 5 minutes thereafter.

PRIMARY SURVEY

<p>1. Evaluate airway and protective airway reflexes</p>	<p>Signs of airway obstruction and respiratory distress include:</p> <table border="0"> <tr> <td>Cyanosis</td> <td>intercostal retractions</td> </tr> <tr> <td>stridor</td> <td>absent breath sounds</td> </tr> <tr> <td>drooling</td> <td>bradycardia</td> </tr> <tr> <td>nasal flaring</td> <td>apnea or bradypnea</td> </tr> <tr> <td>choking</td> <td>tachypnea</td> </tr> <tr> <td>grunting</td> <td>irritability, lethargy</td> </tr> </table>	Cyanosis	intercostal retractions	stridor	absent breath sounds	drooling	bradycardia	nasal flaring	apnea or bradypnea	choking	tachypnea	grunting	irritability, lethargy
Cyanosis	intercostal retractions												
stridor	absent breath sounds												
drooling	bradycardia												
nasal flaring	apnea or bradypnea												
choking	tachypnea												
grunting	irritability, lethargy												
<p>2. Basic airway/spinal immobilization prn</p>	<p>Open airway using jaw thrust, chin lift (and/or head tilt if no suspected spinal trauma) and suction. Consider placement of OPA if unconscious. If cervical spine trauma suspected, immobilize neck with appropriate device. Infants and children may require under-shoulder support to achieve neutral cervical spine position.</p>												
<p>3. Oxygen</p>	<p>Use nasopharyngeal or oropharyngeal airway, mask, or oxygen by blow-by, as tolerated, with child in position of comfort.</p>												
<p>4. Assist ventilation if needed</p>	<p>Use chest rise as indicator of adequate ventilation. If chest rise inadequate, consider:</p> <ul style="list-style-type: none"> • repositioning the airway • foreign body in airway • inadequate bag volume or activated pop-off valve <p>Rescue breathing included two initial, slow breaths then 20/min for infant or child</p>												
<p>5. Evaluate circulation</p>	<p>Assess perfusion using:</p> <table border="0"> <tr> <td>heart rate</td> <td>mental status</td> </tr> <tr> <td>skin signs</td> <td>quality of pulse</td> </tr> <tr> <td>capillary refill</td> <td>blood pressure</td> </tr> </table> <p>Compression rate 120/min for newborn, 100/min for infants and children with 5:1 compression: ventilation ratio. Depths are 1/2 -1 inch for infant and 1-1 1/2 inches for children</p>	heart rate	mental status	skin signs	quality of pulse	capillary refill	blood pressure						
heart rate	mental status												
skin signs	quality of pulse												
capillary refill	blood pressure												

PEDIATRIC CARDIAC ARREST P1

Field treatment 1. Primary survey 2. Determine pulselessness & begin CPR 3. Cardiac monitor	Considerations If unable to establish IV or IO access, administer drugs via endotracheal tube as indicated Epinephrine 1:1000=1mg/cc Epinephrine 1:10,000=1mg/10cc * Biphasic equivalent may be used for defibrillation dosing.	
Asystole (flat line or slow wide complex <30/min)	Pulseless Electrical Activity	Ventricular Fibrillation or Pulseless Ventricular Tachycardia
4. Advanced airway management 5. Vascular access: 3 attempts, or 90 sec. If no Success, attempt IO 6. Epinephrine 1st dose: IV/IO: 0.01mg/kg (1:10000) 0.1 cc/kg ET: 0.1 mg/kg (1:1000) 0.1cc/kg May repeat q 3-5 min 7. Contact hospital	4. Advanced airway management 5. Identify & treat causes: severe hypoxemia, acidosis, hypovolemia; tension pneumo, tamponade, profound hypothermia 6. Vascular access: 3 attempts, or 90 seconds. If no Success, attempt IO 7. Epinephrine 1st dose: IV/IO: 0.01 mg/kg (1:10000) 0.1cc/kg ET: 0.1mg/kg (1:1000) 0.1cc/kg May repeat q 3-5 min 8. Fluid bolus, 20 ml/kg 9. Contact hospital	4. Defib: 2J/kg, 4J/kg, 4J/kg 5. Advanced airway management 6. Vascular access: 3 attempts, or 90 seconds. If no success, attempt IO. 7. Epinephrine 1st dose: IV/IO: 0.01 mg/kg (1:10000) 0.1cc/kg ETT: 0.1mg/kg (1:1000) 0.1cc/kg May repeat q 3-5 min. 8. Defib 4 J/kg 30-60 sec after each med. 9. Lidocaine 1 mg/kg May repeat q 3-5 min to a maximum dose 3 mg/kg. 10. Defib 4 J/kg 30-60 sec after each med. 11. Contact hospital

NEONATAL RESUSCITATION P2

<p>Field Treatment</p> <ol style="list-style-type: none"> 1. Dry and keep warm with thermal blanket or dry towel 2. Position airway 3. Suction mouth and nasopharynx 4. Stimulate by drying vigorously including head and back 5. Evaluate respirations 6. Assist as follows: O₂ blow-by or 100% O₂/mask if mild distress; 40-60 breaths/min with assisted ventilation if severe resp. depression 7. Check heart rate at cord site 	<p>Considerations</p> <ul style="list-style-type: none"> • Length based tape for all drug doses • <u>Epinephrine administration is indicated</u> for asystole or spontaneous heart rate less than 80 beats per minute despite adequate ventilation with 100% oxygen & chest compressions. • If medications require endotracheal administration, flush with 3 cc NS, and give several positive pressure ventilations. • If maternal narcotics suspected, give narcan 0.1 mg/kg IV/IM/IO/SQ/ET. Repeat every 2-3 min. • Clamp & cut cord as appropriate <p>Epinephrine concentrations: Epinephrine 1:1000 =1 mg/cc Epinephrine 1:10,000=1 mg/10cc</p>
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HR < 60/min	HR 60-80/min	HR 80-100/min and rising	HR >100/min
<ol style="list-style-type: none"> 8. Continue assisted ventilation 9. Begin chest compressions 120/min, using both thumbs to do compressions 10. If no improvement in 30 sec., perform endotracheal intubation 11. If no improvement in 1 min: Epinephrine 1:10000 0.01-0.03mg/kg IV/IO/ or ET. Repeat every 3-5 min. 12. If condition deteriorates to cardiac arrest, follow cardiac arrest protocol 13. Reassess heart rate and respirations en route 14. Contact hospital 	<ol style="list-style-type: none"> 8. Continue assisted ventilation 9. If no improvement after 30 sec. of ventilation with 100% oxygen, begin chest compressions, using both thumbs 10. If heart rate remains < 80: Epinephrine 1:10000 0.01 mg/kg IV/IO/ET. Repeat every 3-5 min. 11. Reassess HR and resp rate en route 12. Contact hospital 	<ol style="list-style-type: none"> 8. Continue assisted ventilation 9. Reassess HR after 15-30 sec 10. Contact hospital 	<ol style="list-style-type: none"> 8. Check skin color. Give O₂ by blow-by or mask if peripheral cyanosis 9. Reassess HR and resp. en route 10. Contact hospital

PEDIATRIC RESPIRATORY DISTRESS P3

<p>Field Treatment</p> <ol style="list-style-type: none"> 1. Primary Survey 2. Position of comfort to maintain airway 3. Oxygen 100% by blowby or NRM; allow parent to administer if appropriate 	<p>Considerations</p> <ul style="list-style-type: none"> • DO NOT attempt to visualize the throat or insert anything into mouth if epiglottitis suspected • KEEP PATIENT CALM. Separation of child from parent may exacerbate distress; incorporate parent into care. AVOID agitating patient; minimize noxious stimuli • IV access should NOT be attempted unless patient progresses to respiratory failure and/or shock or severe hypo-perfused state • If basic airway cannot be established, consider foreign body obstruction and proceed with appropriate airway clearance maneuvers based on patient age 	
Stridor	Lower Airway Obstruction (wheezing)	Foreign Body Obstruction
<ol style="list-style-type: none"> 4. Transport in position of comfort: allow parent to hold child during transport, if feasible 5. Maintain airway & oxygen 6. If moderate to severe respiratory distress, give Epinephrine 1:1000 5mg in 5cc via nebuliser 7. If respiratory failure/apnea/complete obstruction develops: <ul style="list-style-type: none"> --attempt positive pressure ventilation via bag-valve-mask --if unable to ventilate, attempt intubation 	<ol style="list-style-type: none"> 4. Albuterol 2.5 mg in 3cc NS via hand-held nebulizer, mask or bag-valve-mask 5. Repeat Albuterol x 1 6. If response inadequate: <ul style="list-style-type: none"> Epinephrine 1:1000 0.01 mg/kg SQ Maximum single dose: 0.3mg 7. If respiratory failure/apnea/complete obstruction develops: <ul style="list-style-type: none"> --attempt positive pressure ventilation via bag-valve-mask --if unable to ventilate, attempt intubation 	<ol style="list-style-type: none"> 4. <u>Attempt to clear the airway:</u> <ol style="list-style-type: none"> A. Infants < 1 year old: <ul style="list-style-type: none"> five back blows, 5 chest thrusts >/+ 1 year old: Heimlich maneuver B. Visualize larynx & remove foreign body with magill forceps. C. Assist ventilation: bag-valve-mask; Attempt intubation if unsuccessful.

PEDIATRIC TACHYCARDIA P5a
RAPID HEART RATE WITH ADEQUATE PERFUSION

<p>Field Treatment *This algorithm is used for children with rapid heart rate, but ADEQUATE perfusion</p> <ol style="list-style-type: none"> Primary survey, refer to normal vital sign chart Cardiac monitor Pulse oximeter 	<p>Considerations</p> <ul style="list-style-type: none"> Treat only symptomatic infants & children, or children with rhythm which may deteriorate; otherwise, rapid transport If < 2 years old, physiological rates may be in 200/min range; slower (180-220/min) if > 2 years old; consider fever, injury, pain, hypoxia, abnormal electrolytes 	
QRS (<= 0.08sec)		QRS (>0.08sec)
Probable sinus tachycardia Infants: rate <220bpm Children: rate < 180bpm	Probable supraventricular tachycardia Infants: rate >220bpm Children: rate>180bpm	
<ol style="list-style-type: none"> Contact hospital Consider fluid bolus 20cc/kg IV/IO 	<ol style="list-style-type: none"> Contact hospital Consider vascular access Have Adenosine 0.1mg/kg available: If administered , push as rapidly as possible, followed by 5 cc rapid flush --double & repeat x 1 --maximum dose = 12mg 	<ol style="list-style-type: none"> Contact hospital Vascular access Lidocaine 1 mg/kg to maximum of 3 mg/kg If Lidocaine unsuccessful: Consider adenosine 0.1mg/kg, Followed by 5 cc rapid flush --double & repeat x 1 --maximum dose = 12 mg.

PEDIATRIC TACHYCARDIA P5b
RAPID HEART RATE WITH POOR PERFUSION

Field Treatment *This algorithm is used for children with rapid heart rate and POOR perfusion 1. Primary survey, refer to normal vital sign chart 2. Assess & maintain airway 3. Cardiac monitor 4. Pulse oximeter		Considerations <ul style="list-style-type: none"> • RAPID TRANSPORT • Treat only symptomatic infants & children, or children with rhythm which may deteriorate • Signs of systemic hypoperfusion include change in LOC, Mottled, cool skin; cap refill > 3 sec; pallor • If < 2 years old, physiological rates may be in 200/min range; slower (180-220/min) if > 2 years old; consider fever, injury, pain, hypoxia, abnormal electrolytes • For synchronized cardioversion: *peds paddles if <10 kg. If not available: *adult paddles in A-P position • Biphasic equivalent dosing when applicable 	
QRS (<= 0.08sec)		QRS (>0.08sec)	
Probable sinus tachycardia Infants: rate <220bpm Children: rate <180bpm		Probable supraventricular tachycardia Infants: rate >220bpm Children: rate > 180bpm	
5. Vascular access 6. Fluid bolus 20cc/kg 7. Contact hospital	6. Contact hospital 7. If vascular access present or rapidly available: Adenosine 0.1mg/kg: Push as rapidly as possible, followed by 5 cc rapid flush --double & repeat x 1 --maximum dose = 12mg 8. If no vascular access available OR adenosine does not convert pt: Synchronized cardioversion for SVT: 0.5-1.0 J/kg or biphasic equivalent Repeat as necessary	6. Contact hospital 7. DO NOT DELAY CARDIOVERSION IF IV NOT AVAILABLE 8. If vascular access present or rapidly available: Lidocaine 1 mg/kg (no cardioversion delays) 8. Synchronized Cardioversion: 0.5 to 1.0 J/kg or biphasic equivalent Repeat as necessary	

PEDIATRIC SHOCK P6

<p>Field Treatment</p> <ol style="list-style-type: none"> 1. Primary survey 2. Advanced airway management 3. Shock position if tolerated, keep patient warm 4. Cardiac monitor 5. Vascular access/IO access 6. Oximeter 	<p>Considerations</p> <p>Shock is a clinical condition in which inadequate organ and tissue perfusion exists, manifested in extreme cases by acidosis and/or hypoxemia. Shock may be compensated—blood pressure is maintained through physiologic responses; or uncompensated—physiologic responses are exhausted & a subsequent state of low cardiac output occurs. Shock in children may be the result of respiratory failure, hypovolemia, distributive causes (sepsis, anaphylaxis) or cardiogenic related problems (rhythm disturbances, myocarditis, blunt chest trauma, etc.). Signs & symptoms in late shock may include cool, clammy, ashen or mottled skin; diminished level of consciousness or response to parents or pain; flaccid muscle tone; poorly palpable pulses; delayed capillary filling time; tachypnea & respiratory distress, progressing to diminished respirations and respiratory failure; hypotension; and oliguria/anuria.</p>	
<p style="text-align: center;">Hypovolemia Dehydration, burns, blood loss, extreme GI losses</p>	<p style="text-align: center;">Distributive Sepsis, anaphylaxis</p>	<p style="text-align: center;">Cardiogenic Rhythm disturbances; myocarditis</p>
<ol style="list-style-type: none"> 7. Fluid bolus 20 ml/kg IV/IO 8. Contact hospital, initiate transport 9. Repeat fluid bolus 20ml/kg IV/IO 	<ol style="list-style-type: none"> 7. Fluid bolus 20 mg/kg IV/IO 8. Contact hospital, initiate transport 9. If suspected allergic reaction, follow protocol for anaphylaxis 10. Repeat fluid bolus 20ml/kg IV/IO 	<ol style="list-style-type: none"> 7. Treat according to appropriate protocol if rhythm disturbance present 8. Fluid bolus, 10 ml/kg IV/IO 8. Contact hospital, initiate transport

PEDIATRIC ALLERGIC REACTION P7

INFORMATION NEEDED

- Exposure to common allergens (stings, drugs, nuts, seafood, meds), prior allergic reactions
- Respiratory: wheezing; stridor; grunting; nasal flaring; respiratory distress; edema of lips, tongue or face
- Other symptoms: nausea, weakness, anxiety, abdominal cramping

OBJECTIVE FINDINGS

<u>Mild</u>	<u>Moderate</u>	<u>Severe (Anaphylaxis)</u>
<ul style="list-style-type: none"> • Hives, rash • No respiratory distress 	<ul style="list-style-type: none"> • Hives, rash * Abdominal cramping • Normotensive * Mild bronchospasm • Swelling of mucous membranes 	<ul style="list-style-type: none"> • Altered mental status * Angioedema • Hypoperfusion * Abdominal cramping • Respiratory distress – grunting, flaring, stridor, bronchospasm

BLS TREATMENT

- Remove etiologic agent if possible or relocate patient
- Ensure patent airway, Administer O2 by blow-by or BVM
- For severe allergic reaction/anaphylaxis, **Auto-Injector Epi-Pen*** (> 30 kg) or **Epi-Pen Jr.*** (<30 kg), MR in 5 minutes if necessary (may use appropriate dosage pre-filled syringe) * *Only EMTs trained in Auto-Injector Epi- Pen administration may perform this procedure*

ALS TREATMENT

<u>Mild</u>	<u>Moderate</u>	<u>Severe (Anaphylaxis)</u>
<ul style="list-style-type: none"> • Pulse Oximetry • Consider Benadryl 1 mg/kg IM (max. 50 mg) 	<ul style="list-style-type: none"> • Pulse Oximetry • Cardiac Monitor • IV, O2 • Benadryl • Epinephrine SQ (1:1000) 0.01 mg/kg, (0.01 ml/kg) max 0.3 mg (0.3ml) • Resp. Symptoms: Albuterol 2.5 mg/3ml NS via HHN, MR x 1 if no improvement 	<ul style="list-style-type: none"> • Pulse Oximetry • Epinephrine SQ (1:1000) 0.01 mg/kg (0.01ml/kg); Max.0.3 mg (0.3 ml) • IV, IO If Needed • Fluid challenge 20ml/kg if hypotensive. MR • O2, 100% NRB If Needed • Epinephrine (1:10,000) 0.01 mg/kg (0.1ml/kg)IV/IO, Max 0.3 mg (3 ml) • Albuterol 2.5 mg/3ml NS if wheezes or resp. distress • Benadryl 1 mg/kg IV/IO, max of 50 mg

Documentation for adherence to protocol:

- Oxygen given * Estimated Pediatric Weight (kg)
- Level of distress (mild, moderate, severe) and associated respiratory distress findings * Correct dosages of medications if administered

PRECAUTIONS AND COMMENTS:

- Epinephrine may cause anxiety, tremors, palpitations, tachycardia, and headache.
- Verify the proper dilution and dose of Epinephrine prior to administration
- Use Pediatric Broslow Tape for estimated weight and medication dosing when possible.
- Edema of the soft structures of the upper airway may be lethal. Be prepared for early intubation before swelling precludes this intervention.
- Only EMTs trained and certified in Auto-Injector Epi-Pen administration may perform Epi-Pen emergency treatment
- Preloaded Epinephrine syringe (0.15mg or 0.3mg) may be substituted for the Auto-Injector Epi-Pen

PEDIATRIC ALTERED LEVEL OF CONSCIOUSNESS P9

Field Treatment	Considerations
<ol style="list-style-type: none">1. Primary survey2. Administer oral glucose if conscious, known diabetic with intact gag reflex	<ul style="list-style-type: none">• Consider etiology and appropriate protocols: shock, toxic exposure, head trauma, seizure, hypothermia, hypoglycemia.• A maximum of 25% dextrose should be infused peripherally• Pulse oximetry<ul style="list-style-type: none">• Avoid narcan with neonates unless strong suspicion of maternal exposure (refer to neonatal resuscitation protocol as indicated) <p>Dextrose 25%=mix 1 cc D 50% with 1 cc NS Dextrose 10%=mix 1 cc D 50% with 4 cc NS</p>
<ol style="list-style-type: none">3. Advanced airway as needed4. Cardiac monitor5. Vascular access and evaluation of blood glucose6. If glucose <60 (40 if neonate) or unmeasurable and<ul style="list-style-type: none">• > 2 yrs, give dextrose 50% 1 ml/kg IV/IO• < 2 yrs, give dextrose 25% 2 ml/kg IV/IO• neonate, give dextrose 10% 3ml/kg IV/IO• if no vascular access, glucagon 1 mg IM7. If mental status and respiratory effort are depressed, give narcan 0.1 mg/kg IM/IV/IO/ET. May repeat q 5 min if no improvement in LOC and strong suspicion of opiate exposure.8. Contact hospital	

PEDIATRIC TOXIC EXPOSURES P10

Field Treatment	Considerations
<ol style="list-style-type: none"> 1. Assess scene 2. Primary survey 3. Bring identifying substance containers to hospital when possible/appropriate 4. Airway management as appropriate 5. Cardiac monitor 6. Venous access if indicated 7. Transport as soon as possible 8. Contact hospital 	<ul style="list-style-type: none"> • Early contact with Poison Control Center • Pulse oximetry • Do NOT give charcoal or any meds by mouth if ANY respiratory compromise or decreasing level of consciousness exists or is a possibility (e.g. tricyclic OD); contact hospital for direction • If suspected opiate overdose in non-neonate, give Narcan 0.1 mg/kg IV/IO/IM prior to advanced airway management
<p>Hydrocarbons or Petroleum Distillates</p> <ul style="list-style-type: none"> • Do not induce vomiting • Transport immediately 	
<p>Caustics/Corrosives</p> <ul style="list-style-type: none"> • Do not induce vomiting • Transport immediately 	
<p>Insecticides</p> <ul style="list-style-type: none"> • If skin exposure, decontaminate patient; avoid contamination of prehospital personnel • Transport immediately • Contact hospital 	
<p>Cyclic Antidepressants</p> <ul style="list-style-type: none"> • Anticipate rapid deterioration of condition • If life-threatening dysrhythmias present: hyperventilate, give Sodium bicarbonate 1 mEq/kg IVP • If seizures occur, valium 0.1 mg/kg IV/IO may repeat 2 x or 0.5 mg/kg rectally, max of 10 mg 	
<p>Phenothiazine Reactions</p> <ul style="list-style-type: none"> • Reassurance; transport immediately • Contact hospital: for severe adverse reactions: Benadryl 1 mg/kg IM PHYSICIAN ORDER ONLY 	
<p>Other Non-Caustic Drugs (awake and alert and managing own airway)</p> <ul style="list-style-type: none"> • Activated charcoal 1 Gm/kg PO, max of 50 Gm 	

MAJOR PEDIATRIC BURNS P11

<p>Field Treatment</p> <ol style="list-style-type: none"> 1. Primary survey 2. Stop burning process, remove jewelry and clothing 3. If dry chemical, brush off, then flush with copious water. If liquid, flush with copious water 4. If eye involvement, flush continuously with NS during transport 5. Apply clean, <u>dry</u> wound dressing and/or sheet to involved area; protect blisters from rupture 6. Shock position if appropriate 7. Advanced airway as needed; 100% oxygen via blow-by or NRM If intubation required, consider an ETT one to two sizes smaller due to potential for airway swelling, injury 	<p>Considerations</p> <ul style="list-style-type: none"> • Major Burns: BSA >15% or burns to face, eyes, ears, airway. Smoke inhalation or suspected smoke inhalation should be considered as a major burn. • High flow oxygen if inhalation injury suspected: examine for hoarseness, facial burns, soot in the nose or mouth; respiratory distress, or burns which occurred in a closed space • Children have a higher ratio of body surface area to body mass than adults, and lose significantly more body heat. Do not apply cool dressings or allow environmental exposure due to risk of hypothermia.
Thermal Injury/Chemical Burns	Electrical Burns
<ol style="list-style-type: none"> 9. Vascular access if appropriate 10. Contact hospital 11. Pediatric pain management protocol as indicated 	<ol style="list-style-type: none"> 9.. Cardiac monitor 10. Vascular access if appropriate 11. Treat dysrhythmia by appropriate protocol 12. Contact hospital

PEDIATRIC TRAUMA P12

Field Treatment	Considerations
<ol style="list-style-type: none">1. Primary survey2. ABCs: insure adequate airway with in-line cervical immobilization3. If compromised systemic perfusion: IV/IO as needed: isotonic crystalloid bolus of 20cc/kg4. Consider Load on MAST; if suspected pelvic or long bone fracture(s)5. Contact hospital	<ol style="list-style-type: none">1. More pediatric trauma preventable deaths are related to improper airway stabilization than c-spine, spinal cord, or multiple injuries.2. The child with multi-system trauma may have both respiratory failure and shock.3. In severe trauma, ABCs and RAPID pediatric trauma center transport.

Approach to the Child With Multiple Injuries

1. Open airway:
Maintain manual in-line cervical spine stabilization
Modified jaw thrust
2. Clear oropharynx.
3. Administer 100% oxygen using nonbreathing mask if child is awake and breathes spontaneously.
4. If altered mental status OR respiratory distress: hyperventilate with 100% oxygen.
5. If unresponsive OR respiratory failure: attempt intubation.
6. Maintain airway patency: suction, oropharyngeal airway as necessary.
7. Initiate CPR and control external bleeding.
8. Contact hospital/treat suspected tension/open pneumothorax if severe cardiorespiratory compromise exists.
9. Vascular access: 2 attempts or 90 seconds. IO if required.
10. If signs of poor systemic perfusion: 20cc/kg isotonic crystalloid solution. Infuse 2nd bolus if shock or severe hemorrhage.
11. Immobilize neck with semi-rigid collar or head immobilizer and tape.
12. Transport to Pediatric Trauma Center.

*Pediatric Advanced Life Support, American Heart Association, 1997-1999; 8-7.

APPARENT LIFE THREATENING EVENT (ALTE) P13

DEFINITION

An Apparent Life-Threatening Event (ALTE) is defined as an episode that is frightening to the observer and is characterized by some combination of:

- Apnea (central or obstructive)
- Color change (cyanosis, pallor, erythema)
- Marked change in muscle tone
- Unexplained choking or gagging

INFORMATION NEEDED

- Age (Although it usually occurs in infants < 12 months, any child under 24 months who experiences any of the above may be considered an ALTE)
- Medical history (i.e. recent illness or trauma, swallowing dysfunction, seizures, CNS abnormalities, respiratory disease, cardiac disease)
- Suspicion or history of child abuse
- Severity, nature and duration of the episode

CONDITIONS RESPONSIBLE FOR ALTE

- | | | | |
|--------------|--------------------------------|----------|--------------------------|
| *Child abuse | *Cardiac arrhythmias/anomalies | *Seizure | *Toxic Ingestions |
| *Meningitis | *SIDS | *Sepsis | *Intracranial hemorrhage |

BLS Treatment	ALS Treatment
<ul style="list-style-type: none"> • ABCs • Reassure patient and leave in caretaker's arms in position of comfort • Blow-by oxygen as tolerated 	<ul style="list-style-type: none"> • Pulse oximetry • Cardiac monitor • IV if needed • Evaluate blood glucose. If <60 (40 if neonate) or unmeasurable: <ul style="list-style-type: none"> - neonate - 3 mos: Dextrose 10% 3ml/kg IV/IO - 3 mos - 2 yrs: Dextrose 25% 2ml/kg IV/IO - if no vascular access, Glucagon 0.1 mg/kg (0.1 ml) IM • ALS Transport

Documentation for Adherence to Protocol:

- Comprehensive physical exam that includes the general appearance of the child, skin color, extent of interaction with environment, and evidence of trauma
- Treatment of any identifiable causes, including details of resuscitation required
- **Physician consult** if the parent/guardian is refusing medical care and/or transport

PRECAUTIONS AND COMMENTS

- Assume the parental history (above) is real, and treat and transfer child no matter how well the child might appear
- Most ALTE patients (formerly known as "near-miss SIDS") have a normal physical exam when assessed by responding field personnel

**PEDIATRIC MEDICATIONS
 AUTHORIZED/STANDARD INITIAL DOSE**

Drug	Concentration	Standard Dosage
Activated Charcoal	25 Gm/bottle	1 gm/kg PO (not to exceed 50 Gm)
Adenosine (Adenocard)	6 mg/2ml	SVT : 0.1 mg/kg (2nd dose is double the first dose; max. dose of 12 mg or 4cc)
Albuterol	2.5 mg/3ml NS	2.5 mg/3cc NS
Atropine	1 mg/10ml	Bradycardia : 0.02 mg/kg IV/IO/ET (Minimum dose is 0.1 mg or 1ml; single max dose for child is 0.5mg or 5 ml and for adolescents is 1mg or 10ml), MR x 1 Organophosphate Poisoning : 0.02 mg/kg IV/IO; MR q 2-5 minutes until drying of secretions
Calcium Chloride 10%	1 Gm/10 ml	1 Gm/10 ml
Dextrose 10%	D50W – diluted 1:4	Neonatal – 3 months: 3ml/kg IV/IO
Dextrose 25%	2.5 Gm/10 cc	3 months - 2yrs: 2ml/kg IV/IO
Dextrose 50%	25 Gms/50ml	>2yrs: 1ml/kg IV/IO
Diazepam (Valium)	10 mg/2 ml	0.1 mg/kg (0.02 ml/kg) IV slowly; MR x 2 q 5 min. to max. dose of 0.3 mg/kg (0.06 ml/kg) or 0.5 mg/kg (0.1 ml/kg) Rectal, Max 10 mg
Diphenhydramine (Benadryl)	50 mg/1ml or 50 mg/ 10ml	1 mg/kg IV or IM to max of 50 mg
Epinephrine 1:1000	1 mg/1 ml Pedi Auto-Injector Or pre-filled syringe (0.15mg)	Allergic reaction moderate/severe/anaphylaxis : 0.01 mg/kg SQ (0.01 ml/kg) max. of 0.3 mg (0.3 ml) or Pedi Auto-Injector/pre-filled syringe; repeat prn in 5 minutes Bradycardia : 0.01 mg/kg (0.01 ml/kg) ETT
Epinephrine 1:10,000	1 mg/10 ml	Anaphylaxis : if no response to Epi 1:1000, give 1:10,000 0.01 mg/kg (0.1 ml/kg) IV/IO Bradycardia : 0.01 mg/kg (0.1 ml/kg) IV/IO Cardiac Arrest : 1 mg (10ml)IVP
Furosemide (Lasix)	Variable	0.5 mg/kg IV; 1.0 mg/kg if patient normally takes Lasix
Glucagon	1 mg/1 ml	0.1 mg/kg SQ/IM/IV
Instant Glucose	30 Gms/tube	30 Gms PO

Ipratropium (Atrovent)	500 mcg in each unit dose (2.5 ml)	Unit dose
Lidocaine	100 mg/ 10 ml	1 mg/kg to max of 3 mg/kg
Midazolam (Versed)	2 mg/ml or 10 mg/ml	Cardioversion: 0.05 mg/kg slow IVP or IM (max. dose of 5 mg) Seizures: 0.05mg/kg slow IVP or IM (max. dose of 5 mg)
Morphine Sulfate	10 mg/10 ml	Pain Management*: 0.1mg/kg (0.1ml/kg) slow IVP/IM; MR x 1 in 15 min if IV or in 30 min. if IM *Physician Consultation if <6months
Nalaxone (Narcan)	2 mg/5 ml	Suspected OD in non-neonate: 0.1 mg/kg (0.25 ml/kg) IV/IO/IM
Sodium bicarbonate	50 mEq/50 ml	Crush Syndrome: 1 mEq/kg up to 100 mEq IVP Cyclic Antidepressant OD with significant dysrhythmias: 1 mEq/kg IVP

COMBITUBE POLICY AND PROCEDURE

I. INDICATIONS

- A. An advanced airway device (double lumen) designed for emergency or difficult intubation.
- B. Alternative airway control (“Rescue Airway”) when:
 - 1. BVM is inadequate
 - 2. Intubation is unavailable
 - 3. Intubation is anticipated to be difficult
 - 4. Intubation is unsuccessful after no more than two attempts by a single provider or three attempts by two providers.

II. POLICY

- A. Paramedics who have successfully completed a Marin County-approved training program may perform Combitube insertion using the method described in the accompanying procedure. This skill will be included in the Marin County “Skills Refresher Program.”
- B. Indicators / Required Documentation for Adherence to Protocol:
 - 1. Number of attempts
 - 2. Success of procedure
 - 3. Confirmation of tube placement through breath sounds, End-Tidal CO₂ detector, pulse ox, EDD, and absence of gastric ventilated sounds

III. CONTRAINDICATIONS

- A. Responsive patients with an intact gag reflex
- B. Patients with known esophageal disease
- C. Patients who have ingested caustic substances
- D. Patients under 5 ft. tall.
- F. Known latex allergy
- G. Tracheal stoma

IV. EQUIPMENT

- | | |
|-------------------------------|---------------------------------------|
| A. Combitube (Adult) | F. Water soluble lubricant |
| B. Combitube SA (Small Adult) | G. Stethoscope |
| C. Oxygen Supply | H. End-tidal CO ₂ detector |
| D. 100cc syringe | I. Portable Suction Device |
| E. 20cc syringe | J. EDD |

V. PROCEDURE

- A. Maintain body substance isolation
- B. Open airway, clear of any foreign objects and pre-oxygenate with 100% O₂
- C. Select proper tube size (Combitube SA or Combitube)
- D. Check cuffs for leaks. Inflate the proximal pharyngeal cuff (Blue balloon, #1) with 100 ml of air. Inflate the distal (White balloon, #2) with 15 ml of air. Deflate cuffs prior to insertion.
- E. Apply water soluble lubricant to the distal end of the tube
- F. Attach the 100 cc syringe (filled with air) to the Blue port and the 20 cc syringe (filled w/ air) to the White port
- G. Place head into hyper-extended position if no spine injury. If potential for C-spine injury, intubate patient in neutral position.
- H. Grasp lower jaw and tongue and lift to open mouth
- I. Insert the tip into the mouth, advancing in a downward curved movement until the teeth lie between the two printed bands.
- J. Inflate Blue balloon, #1, with 100 ml of air and White balloon, #2, with 15 ml respectively
- K. Attempt ventilation through tube #1.
- L. If chest rises and falls and lung sounds are heard, continue ventilations.
- M. If no breath sounds are auscultated, immediately begin ventilation through tube #2.
- N. If chest rises and falls and lung sounds are heard, continue ventilations through tube #2.
- O. Continue ventilations using an oxygen delivery system and begin O₂ administration. Reassess patient. Confirm adequate Combitube placement and monitor with End-Tidal CO₂ detector and with EDD.

VI. TROUBLESHOOTING

- A. If air leak is heard, increase inflation slightly through balloon #1 and recheck
- B. If no breath sounds are heard with ventilation through either tube #1 or tube #2, it is possible that the tube has been placed too far into the pharynx. Deflate the #1 pilot balloon and retract tube 2-3cm, then reinflate cuff. Recheck sounds.
- C. If placement is unsuccessful, remove tube, ventilate via BVM and repeat sequence of steps.
- D. If unsuccessful on second attempt, BLS airway management should be resumed.
- E. Most unsuccessful placements relate to failure to keep tube in midline during placement.

VII. MEDICATION ADMINISTRATION THROUGH THE COMBITUBE

A. When the device has been confirmed to be in the *esophagus* (90% of blind insertions are esophageal), medications may be administered via the Blue lumen, #1, as follows:

1. **Epinephrine** (1:1000) 1mg/cc - 10 mg (10cc), may repeat every 3-5 minutes
2. **Atropine** (1mg/10 cc) – 2mg (20cc), single tube
3. **Albuterol** and **Ipratropium (Atrovent)** standard dose

B. When the device has been confirmed to be in the *trachea* (in this setting the White lumen is functioning as a standard “ET” tube), medications indicated via ETT route may be administered (2X IV dosing) such as **Atropine, Epinephrine, Lidocaine, Naloxone, Diazepam, Midazolam (Versed)**, and nebulized medications (**Albuterol** and **Ipratropium**) at standard dosing.

PRECAUTIONS AND COMMENTS

- Never force the insertion of the Combitube.
- Deflate the cuffs prior to repositioning.
- If adequate positioning is confirmed and oxygenation is maintained, do not remove the Combitube to attempt endotracheal intubation.
- End-tidal CO₂ detectors may not detect CO₂ in cardiac arrest cases despite proper tube placement, as with standard ETT intubations.
- Most unsuccessful Combitube placements occur in patients with airway edema from allergic reaction, caustic ingestion, or abscess. Use with caution in these patients.
- An intubation attempt is defined as the introduction of an endotracheal tube past the patient’s teeth.

PEDIATRIC INTUBATION POLICY AND PROCEDURE

**BVM is the preferred airway for pediatric patients*

I. PURPOSE

Pediatric intubation is an ALS procedure to be used on an apneic patient. BLS airway management skills (positioning, BVM) must be done prior to any attempt at intubation. Recent literature supports more selective utilization of pediatric intubation, specifically in cases in which an adequate airway cannot be maintained with BLS airway support. Intubation for the pediatric patient (age 14 and under) should be performed only if BVM ventilation is unsuccessful or impossible. It is imperative to document adequacy of ventilation (BVM and ETT) prior to and after intubation attempts. The goal is to ventilate the patient, not just to intubate. Due to anatomic variation between the adult and pediatric patient, there are some significant differences in the performance of the procedure. Do not sacrifice good ventilation with repeated attempts at intubation. For any given patient, no more than a total of two (2) intubation attempts can be performed prior to transport. Expedite transport whenever possible, with intubation and IV attempts en route.

II. INDICATIONS FOR INTUBATION

- A. Cardiac Arrest
- B. Near Drowning that results in apnea and/or cardiac arrest
- C. Non-responsive, apneic patients who cannot be ventilated adequately with BVM
- D. Uncontrolled airway that cannot be ventilated with a BVM
- E. Bypass airway obstruction
- F. Tracheal suctioning due to heavy meconium aspiration

III. CONTRAINDICATIONS FOR INTUBATION

- A. Apneic patients who can be adequately ventilated with BVM
- B. Responsive patients with spontaneous respirations and/or intact gag reflex
- C. Epiglottitis

IV. EQUIPMENT

- A. Battery powered laryngoscope handle, extra batteries and bulbs
- B. Laryngoscope blades: curved sizes 1-3 and straight sizes 0-3
- C. Pediatric McGill forceps
- D. Endotracheal tubes: un-cuffed 2.0 to 4.5; cuffed 5.0 to 7.0
- E. Lubricating jelly
- F. Disposable pediatric stylets
- G. Suction
- H. Pulse oximetry
- I. Pediatric End Tidal CO2 detector
- J. NPAs / OPAs

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K. Atropine

V. PROCEDURE

- A. Place child in supine position
- B. Perform BVM with 100% O₂ for 1-3 minutes to fully saturate hemoglobin
- C. Maintain BVM if adequate and prepare for transport
- D. If BVM is inadequate (O₂ desaturation), prepare to intubate
- E. Monitor heart rate throughout procedure:
 - * If HR < 60 beats/min for a child or < 80 beats/min for an infant, stop the procedure and ventilate with 100% O₂.
- F. Cervical spine precautions if indicated
- G. Pts < 12 months: consider towel under shoulders to maintain a neutral spine position
- H. Avoid over flexion of the neck to avoid airway occlusion
- I. Select proper ETT size using the Brose low tape or the size of the child's 5th digit.
- J. Suction the airway as needed.
- K. Select proper sized blade. It is recommended to use a straight blade with infants.
- L. Apply cricoid pressure to prevent regurgitation
- M. Using a stylet, insert ETT 2-3 cm past the cords under direct visualization
- N. Remove stylet and bag ventilate. If the chest fails to rise and air is auscultated over the epigastric area, esophageal intubation has most likely occurred. Immediately pull the tube and hyperventilate with BVM.
- O. Allow no longer than 30 seconds per attempt, and hyperventilate between attempts for at least 1 minute.
- P. On scene intubation attempts should be limited to no more than a total of 2 attempts between one or two providers
- Q. Check for proper tube placement
 - 1. Auscultate to confirm equal breath sounds in axilla and over gastric area
 - 2. Use pulse oximetry to confirm O₂ saturation
 - 3. Apply End Tidal CO₂ detector (please remember that ETCO₂ may not register in cardiac arrest scenarios, despite proper placement).
 - 4. If there is any doubt as to proper placement of the ETT, visualize the pharynx with laryngoscope and confirm position
 - 5. If still in doubt remove the ETT and either retry or use BVM
- R. Secure tube and consider head immobilization to prevent tube dislodgement

VI. PRECAUTIONS AND COMMENTS

- A. An intubation attempt is defined as the introduction of an endotracheal tube past the patient's teeth.
- B. Defibrillation should precede intubation.
- C. Hyperventilate before and after administering transtracheal medications (Atropine, Epinephrine, Lidocaine and Narcan)
- D. Atropine (0.02 mg/kg (0.2 cc/kg), minimum 0.1 mg (1 cc) IV/IO pretreatment pediatrics <1 year old, or in setting of pediatric bradycardia. Maximum dosing in pediatrics is 0.5 mg IV/IO. Atropine use in pediatric intubations is highly recommended

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to mitigate against bradycardia and hypotension induced from airway manipulation and laryngoscopy.