
MATANUSKA-SUSITNA BOROUGH EMS



Standing Orders & Protocols

Adopted – April 2007
(Revised March 2012)

Important Telephone Numbers

Mat-Su Regional ER “Bat Phone”	746-5123
Mat-Su Regional ER.....	861-6620
9G Base EMS Dispatch.....	745-4811
MATCOM	352-5401
(AST, Wasilla PD, Houston PD, Wasilla/Houston Animal Control)	
Medic 1.....	(907) 373-8829
MSB QA Manager (Glenn Stevens).....	(907) 373-8817
	(907) 354-4196
Providence Alaska ER.....	(907) 212-3111
STEMI Fax Line.....	(907) 212-3647
Alaska Regional Hospital ER.....	(907) 264-1222
ANMC ER.....	(907) 729-1729
Elmendorf AFB Hospital ER.....	(907) 580-5555
St. Elias Rehabilitation Center.....	(907)
Poison Control Center	(800) 222-1222
Life Alaska (Organ & Tissue Donation)	(800) 719-5433
	(907) 562-5433
American Marine Hyperbaric Center.....	357-5400
After Hours.....	565-4600
Diver’s Alert Network (DAN).....	(919) 684-9111
Office of Children’s Services.....	(800) 478-4444
(Child Abuse/Neglect Reporting)	357-9797
Division of Senior Services	(800) 478-9996
(Elder or Vulnerable Adult Abuse/Neglect Reporting)	(907) 269-3666
Palmer Pioneer Home.....	745-4241
Cottonwood Public Safety Building.....	373-8800
(Station 6-5)	

STANDING ORDERS

Matanuska-Susitna Borough Emergency Medical Services

ETT, EMT-1, EMT-2, EMT-3, EMT-3A, MICP

These orders apply to all ETTs, EMTs, and MICPs operating as medics for the Matanuska-Susitna Borough during ambulance transports or other emergencies originating within the Borough, or dispatched by the Borough's communications center. They do not apply to actions taken by any individual when employed by, or acting on behalf of, an agency other than the Matanuska-Susitna Borough Department of Emergency Services, nor are they valid outside the context of an emergency response or Borough-approved EMS function.

ETT, EMTs and MICPs who are compliant with Matanuska-Susitna Borough EMS training and quality assurance requirements, including expanded scope of practice, as well as requirements set forth at the Federal, State of Alaska and Matanuska-Susitna Borough levels, are authorized to provide prehospital care in accordance with these standing orders.

As of 12/31/2011, all EMT-3, EMT-3A, and MICP providers are required to hold valid ACLS certification, as well as PALS or PEPP (or Medical Director approved equivalent) certifications. EMT-3, EMT-3A and MICP providers must maintain active membership in a MSB-DES emergency service, and be compliant with MSB-DES policies, procedures and training requirements.

Medical practitioners who are licensed by the State of Alaska, hold a current State of Alaska EMT certification, ACLS and PALS or PEPP certifications (or Medical Director approved equivalent), may practice at a level to be determined by the Medical Director and MSB-DES EMS QA Manager. Medical practitioners must maintain active membership in a MSB-DES emergency service, and be compliant with MSB-DES policies, procedures and training requirements.

These orders may change as new techniques are developed or new data are brought to light. It will be the responsibility of all medics to remain abreast of such changes, and to guide their actions accordingly.

Roger Swingle, M.D.
Medical Director

Glenn Stevens, MPA, MICP
Quality Assurance Manager

Dennis Brodigan
Emergency Services Director

Clint Vardeman
Emergency Services Deputy Director

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COMMUNICATIONS

REPORTING ERRATA

The information contained in these protocols is compiled from current sources believed to be reliable. Significant efforts have been expended to make certain that there are no inaccuracies; however, this cannot be guaranteed. Despite our best efforts, there may be typographical errors or omissions. Please make note of such errors/omissions and forward to the MSB EMS Training Office at the Cottonwood Public Safety Building (Station 6-5). No protocol can be guaranteed to be error-free. If an error is discovered that may adversely affect patient care, the responder should act in the patient's best interest, and may seek on-line medical direction for clarifications.

ON-LINE MEDICAL DIRECTION

Pre-hospital providers will contact the receiving hospital to obtain patient care orders when indicated. On-line medical direction must occur directly between the ordering physician and the EMS provider who will execute the orders. No relay through other providers is allowed. This applies to all levels of pre-hospital care providers.

COMMUNICATION FAILURE

In the event of complete communication failure and inability to contact Medical Control, these protocols will act as the parameters for pre-hospital patient care. If communication failure occurs, EMS providers will follow these protocols to render appropriate and timely emergency care to the patient.

Upon arrival at the receiving hospital, the lead medic will prepare information relating to the communication failure for the MSB EMS QA Manager. This information should include the PCR number, a description of the events and patient's condition, as well as treatment given. This information shall be forwarded to the EMS QA Manager no later than 12 hours after the event. In the event of a critical occurrence, immediate contact with the EMS QA Manager is required, regardless of time of day.

VERBAL ORDERS BEYOND THE SCOPE OF STANDING ORDERS

This set of written standing orders is intended to guide the actions of MSB EMS providers in the majority of circumstances; however, neither these orders nor any others can anticipate every situation that may arise.

While medics may not exceed their level of training without specific on-line direction, they must use their judgment in applying the standing orders, and should consult Medical Control as appropriate. If a MSB EMS provider is given and executes verbal orders beyond the scope of standing orders, **that information shall be forwarded to the EMS QA Manager immediately** after the event.

In rare circumstances, it may happen that a physician orders a medic to perform a procedure or give a medication for which the medic has not been trained, or that is outside that medic's scope of practice as defined by these standing orders. The medic may comply if each of the following three conditions is met:

1. The physician is the **receiving physician at MSRMC ED -or- sending physician for a transport from MSRMC ED** to another institution, and the physician understands that the order exceeds the provider's scope of practice as defined by the MSB EMS Standing Orders and Protocols.
2. The **physician gives the orders to the medic DIRECTLY** via radio or telephone, or in person before a transport. NO relay through other parties is acceptable.
3. The **medic understands the orders, and is comfortable carrying them out**. A medic who does not feel capable of following such orders may decline, on that basis, to carry them out.

MAT-SU BOROUGH EMS



Section 1

ADULT CARDIAC Protocols

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DESCRIPTION OF ACUTE CORONARY SYNDROME (ACS)

ACS can manifest itself in several ways. When assessing a patient suspected of suffering ACS, note each presenting complaint, and obtain a history appropriate to the presenting symptoms. Common presenting symptoms of ACS include:

- Chest pain, pressure or discomfort
- Anginal equivalents (see chart below)

Chest pain, pressure, and discomfort are the most common presenting symptoms of ACS. When faced with a patient having such symptoms, obtain the following essential elements of the history:

- **“O”** Onset: was the onset gradual or sudden?
- **“P”** Provocation and Palliation: describe anything that worsens, intensifies or alleviates the pain (including medications, moving or a deep breathing)
- **“Q”** Quality: describe the type of pain (dull, sharp, pressing, stabbing, etc.)
- **“R”** Radiation: specify the location of the chest pain (midsternal, left side, etc.) and extension of pain to other areas, if present (jaw, arm, back, shoulders, etc.)
- **“S”** Severity: give a numeric rating of the pain (scale from 1 to 10)
- **“T”** Time: what is the duration of the pain? (when did it start?)

Be certain to **document any steps the patient may have taken to try to relieve the discomfort**, including medications such as NTG, ASA, antacids, etc.

It is also important to remember that chest pain has many causes other than ACS (trauma, infection, anxiety, pleurisy, etc.). Obtaining a thorough patient history is an essential assessment practice.

- **“S”** Signs and symptoms
- **“A”** Allergies
- **“M”** Medications (patient’s medication list can contain critical clues to condition)
- **“P”** Pertinent medical history
- **“L”** Last oral intake
- **“E”** Events that led to the call for emergency response

Anginal Equivalents of ACS

Any of the following symptoms may be indicators (or “Anginal Equivalents” to chest pain) of ACS:

- | | |
|--|----------------------------------|
| ▪ Shoulder or arm pain/numbness/tingling | ▪ Unexplained lack of alertness |
| ▪ Neck, jaw or back pain | ▪ Syncope |
| ▪ General discomfort or weakness | ▪ Dyspnea or shortness of breath |
| ▪ Nausea and/or vomiting | ▪ Feeling of indigestion |

Any of the anginal equivalents listed above may occur with or without associated chest pain, especially in **elderly patients, female patients or those with diabetes**. If the patient has any of these symptoms, and you suspect ACS, obtain history information similar to that described above for chest pain, and perform a 12-lead EKG.

If the diagnosis of ACS is in doubt, the patient should be stabilized with **IV, O₂**, and **continuous cardiac monitoring**.

Decisions regarding further management and/or medications should be guided by index of suspicion that the presentation is the result of ACS, and weighed against the likelihood that medications for ACS could result in harm. Consultation with Medical Control is recommended when feasible.

ACUTE CORONARY SYNDROME (ACS) MANAGEMENT

EARLY TRANSPORT and EARLY NOTIFICATION to hospital ER staff are essential for patients with suspected ACS

- ETT **ABCs:** Support as necessary
 AED: Have available, should cardiac arrest occur
 O₂: Provide oxygen per protocol (SpO₂ target level ≥94%)
- EMT-1 **NTG:** EMT-1 may administer patient's NTG (See Appendix – Admin of Patient's Own Medication)
 ▪ Verify **SBP >100 mmHg, heart rate >50 and <100,**
 ▪ **AND no other contraindications to NTG exist** (See Medication Section - Nitroglycerin)
ASA: **162 mg** (two 81-mg tablets) PO (with on-line Medical Control direction – see notes next page)
CALL FOR ACLS BACKUP: as early as possible when ACS is suspected
- EMT-2 **IV:** Establish vascular access – **NS TKO** (give bolus / faster rate if there is evidence of shock – See Medical Section – Shock, Fluid Resuscitation Notes-Cardiogenic Shock)
 2nd IV: Consider establishing second vascular access site in high-risk patients
- EMT-3 **EKG:** Provide continuous cardiac monitoring
 Obtain 12-lead EKG and report automated interpretation to Medical Control
 ▪ If STEMI or presumed new LBBB identified, notify receiving facility ASAP
 ▪ If Inferior infarct identified, perform right-side EKG (See notes next page)
 Treat dysrhythmias per appropriate algorithm
NTG: **0.4 mg** SL (See notes next page)
Morphine Sulfate: contact Medical Control for orders to administer **2-4 mg** slow IV/IO – repeat as directed.
Medical Control: contact **early** in transport – possible orders may include:
 ▪ Additional NTG
 ▪ Additional morphine
 ▪ Fentanyl
Fibrinolytic Checklist: complete during transport & provide copy to ER physician
 (See Appendix – MSB Acute Coronary Fibrinolytic Checklist)
- EMT-3A **Morphine Sulfate:** If EKG reveals STEMI or presumed new LBBB, administer **2-4 mg** slow IV/IO, and repeat as needed for pain relief (max total 10 mg – See notes next page for additional information regarding pain control with ACS)
ACS following Cocaine or Amphetamine use: assess for contraindications and:
 ▪ Give **diazepam 5 mg** slow IV/IO **or midazolam 2.5mg** slow IV/IO or IN
 (may repeat in 5 minutes if indications continue)
 ▪ Re-assess patient after medication administration

Transport Considerations

Ground transports for ACS should be taken to MSRMC unless alternate destination is ordered per Medical Control.
Consider aeromedical transport for **STEMI** and presumed **new LBBB** patients, when aeromedical transport will result in patient arrival at the appropriate hospital significantly faster than via ground transport (>30 minutes sooner).
The appropriate hospital for STEMI or presumed new LBBB must have cardiac catheterization facilities available when the patient has contraindications to fibrinolytic therapy or cardiogenic shock with pulmonary edema.
(See Appendix – MSB Acute Coronary Fibrinolytic Checklist)

ACUTE CORONARY SYNDROME (ACS) MANAGEMENT – NOTES

Aspirin:

- Do not administer ASA to patients with allergies/hypersensitivity to ASA
- If patient has history of active or recent GI bleeding (within last 30 days), withhold ASA unless ordered by Medical Control.

Nitroglycerin:

- Administer only if **SBP >100 mmHg** and no contraindications exist
- NTG is not indicated if heart rate is **<50** or **>100**
- Absence of vascular access does NOT preclude 1st NTG dose if SBP >100 mmHg
- **Repeat NTG at 3-5 minute intervals** to 3 total doses **IF ALL** of the following are observed:
 - Patient is still experiencing symptoms
 - SBP remains >100 mmHg
 - HR remains >50 and <100

Note: Contact Medical Control if more than 3 doses are believed necessary.

Note: NTG taken by patient before EMS arrival does not count toward the 3-dose total.

Do **NOT** give NTG to patients who have used phosphodiesterase inhibitors for erectile dysfunction in the past 24 hrs (Viagra, Revatio or Levitra) or 48 hrs (Cialis).

- If SBP drops to <100 mmHg and patient is symptomatic:
 - Place patient supine
 - Elevate patient's legs
 - Give **250 ml NS bolus** and re-evaluate BP
 - Give additional NS as needed

Right Ventricular Infarct (RVI):

Inferior infarct on 12-lead may indicate right ventricle infarct:

- Use NTG with caution for inferior infarctions – be ready for fluid infusion – monitor lung sounds
- Perform right-side 12-lead EKG (move V₃ – V₆ to right side)
- If right-side 12-lead EKG shows possible RVI – establish large bore vascular access site
- **Avoid NTG for known RVI**

Morphine Sulfate for pain control during ACS:

Give morphine sulfate, titrated to pain relief **IF ALL** of the following are observed:

- Pain continues after 3rd NTG is given
- SBP remains >100 mmHg
- 12-lead EKG reveals STEMI or presumed new LBBB
- No contraindications to morphine exist

Note 1: If the discomfort is mild, and 12-lead EKG does not show STEMI, morphine sulfate can be withheld. If pain is severe, and EKG does NOT show STEMI or presumed new LBBB, morphine should be given under the direction of Medical Control.

Note 2: If contraindications to morphine sulfate exist, contact Medical Control for possible **Fentanyl** substitution.

HEART FAILURE / ACUTE CARDIOGENIC PULMONARY EDEMA

The following protocols are for patients in respiratory distress due to heart failure or those with acute cardiogenic pulmonary edema, as manifested by “wet” lung sounds (crackles, rales or wheezes). These patients may also display: rapid respiratory rates, hypertension, distended neck veins (JVD), and occasionally frothy/pink sputum. Base your treatment on the severity of their distress.

Routine EMS Care

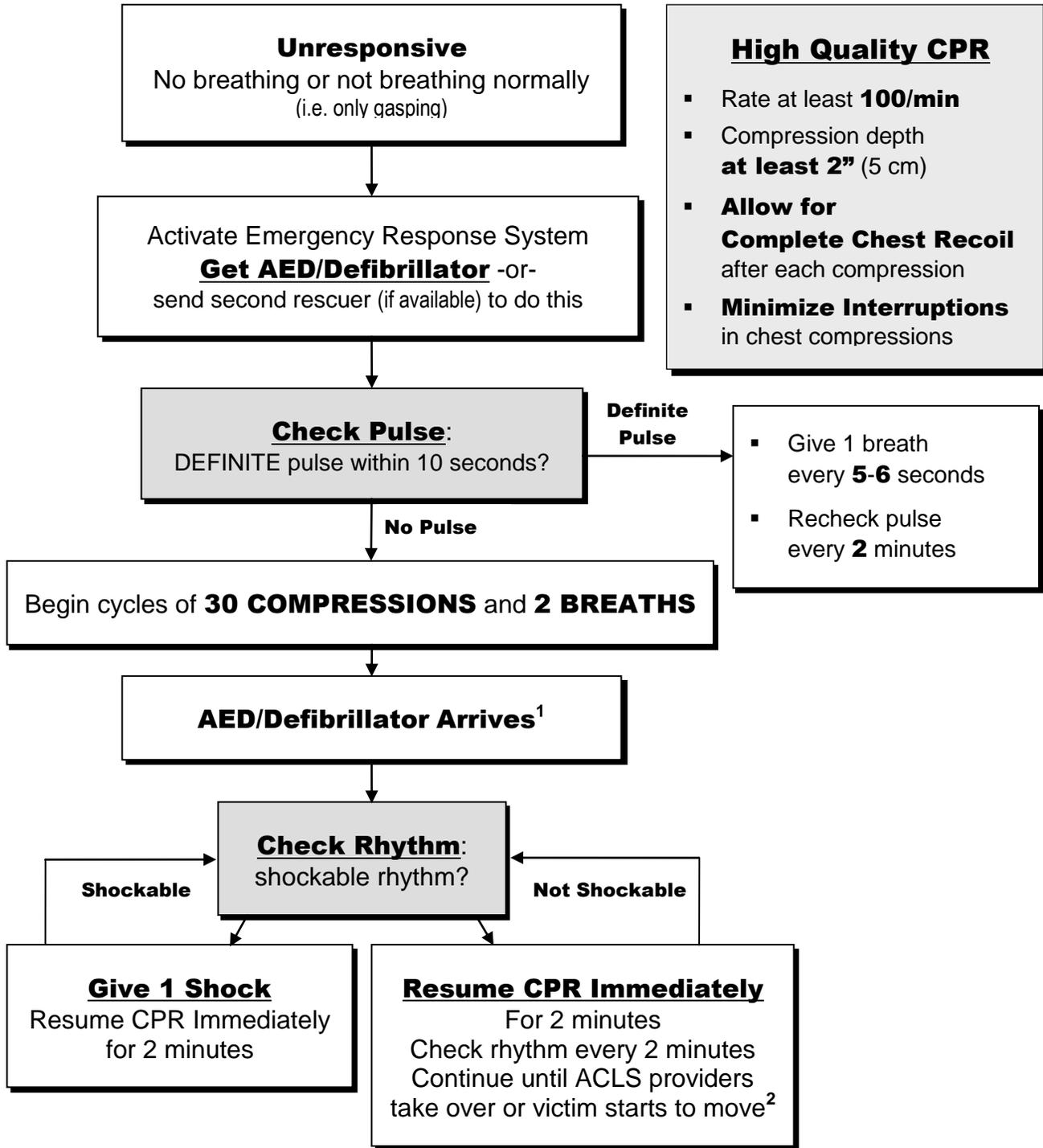
- ETT** **Assess ABCs**
Provide oxygen per protocol – assess lung sounds and VS
Prepare to ventilate w/BVM and 100% oxygen – if the patient deteriorates
Note: As much as feasible, allow the patient to assume a position of comfort such as sitting upright, dangling feet, etc.
Have AED available in case cardiac arrest develops
- EMT-2** **Establish vascular access** – NS (TKO unless there is evidence of shock)
Follow CPAP protocol (See Appendix – Continuous Positive Airway Pressure)
Prepare for King Airway insertion and BVM ventilation – if the patient deteriorates
- EMT-3** **Give NTG 0.4 mg SL after verifying SBP >100 mmHg**
(Repeat every 3-5 minutes until dyspnea subsides, SBP <100 mmHg or SBP is reduced 15% below initial value. If dyspnea continues despite 15% SBP reduction or SBP <100 mmHg, contact Medical Control regarding further NTG orders.)
Contact Medical Control – to discuss additional NTG if dyspnea continues
Notes: If SBP <100 mmHg, or if the patient has used Viagra, Revatio, or Levitra within past 24 hours, or Cialis within past 48 hours, **do not** give NTG
NTG **may** be administered to patients with heart rate >100 bpm who are in sinus tachycardia, and experiencing acute cardiogenic pulmonary edema. Contact Medical Control if feasible, if patient is not in a sinus rhythm, as NTG can cause severe hypotension for these patients. Treatment of the dysrhythmia may be prioritized for these patients.
1st dose of NTG may be given prior to vascular access if SBP >100 mmHg
Obtain 12-lead EKG and provide continuous cardiac monitoring
Notes: Treat dysrhythmias per protocol, notify receiving hospital for STEMI / presumed new LBBB
Patients with acute cardiogenic pulmonary edema with STEMI / presumed new LBBB should be transferred to a facility where PCI is readily available, if feasible.
Prepare to place advanced airway – if the patient deteriorates
- MICP** If 3 doses of NTG do not relieve dyspnea, give furosemide 40 mg slow IV/IO
(additional doses require Medical Control orders)
Note: furosemide is contraindicated if SBP <90 mmHg

BASIC LIFE SUPPORT SUMMARY CHART

Note: Maneuvers used only by health care providers are indicated by “**HCP**”

Recommendations			
Component	Adults	Children	Infants
<u>Recognition:</u>	Unresponsive (for all ages)		
	No Breathing -or- Only Gasp		
	No Pulse palpated within 10 seconds		
<u>CPR Sequence:</u>	CAB	CAB	CAB
<u>Compression Rate:</u>	At least 100 per minute		
<u>Compression Depth:</u>	At least 2 inches	At least 1/3 depth of chest (about 2 inches or 5 cm)	At least 1/3 depth of chest (about 1 ½ inches or 4 cm)
<u>Chest Wall Recoil:</u>	Allow Complete Recoil Between Compressions (HCP – rotate compressors every 2 minutes)		
<u>Compression Interruptions:</u>	Minimize Interruptions in Chest Compressions (If interruption is necessary, limit to less than 10 seconds)		
<u>Airway Opening:</u>	Head-tilt chin-lift (HCP – use jaw thrust if trauma suspected)		
<u>Compression to Ventilation Ratio:</u> (prior to advanced airway)	30:2 (1 or 2 Rescuers)	30:2 (Single Rescuer) 15:2 (2 HCP Rescuers)	30:2 (Single Rescuer) 15:2 (2 HCP Rescuers)
<u>Ventilations with Advanced Airway:</u> (for pulseless patient)	1 Breath every 6-8 seconds (8-10 breaths per minute) Asynchronous with chest compressions About 1 second per breath – visible chest rise		
<u>Defibrillation:</u>	Attach and use AED as soon as available. Minimize interruptions in chest compressions before and after shock Resume CPR <u>beginning with compressions</u> immediately after each shock		
<u>Ventilations for Patient with Pulses:</u>	1 Breath every 5-6 seconds	1 Breath every 3-5 seconds	

ADULT BLS ALGORITHM (Patients Post-puberty)



Note 1: If arrest is witnessed and less than 5 minutes duration or competent CPR is being performed on EMS arrival, analyze with AED as soon as possible.

Note 2: If ACLS is NOT available, and the patient IS NOT hypothermic, contact Medical Control to discuss treatment options and possible termination of resuscitation efforts if the patient remains pulseless after 30 minutes of properly performed CPR.

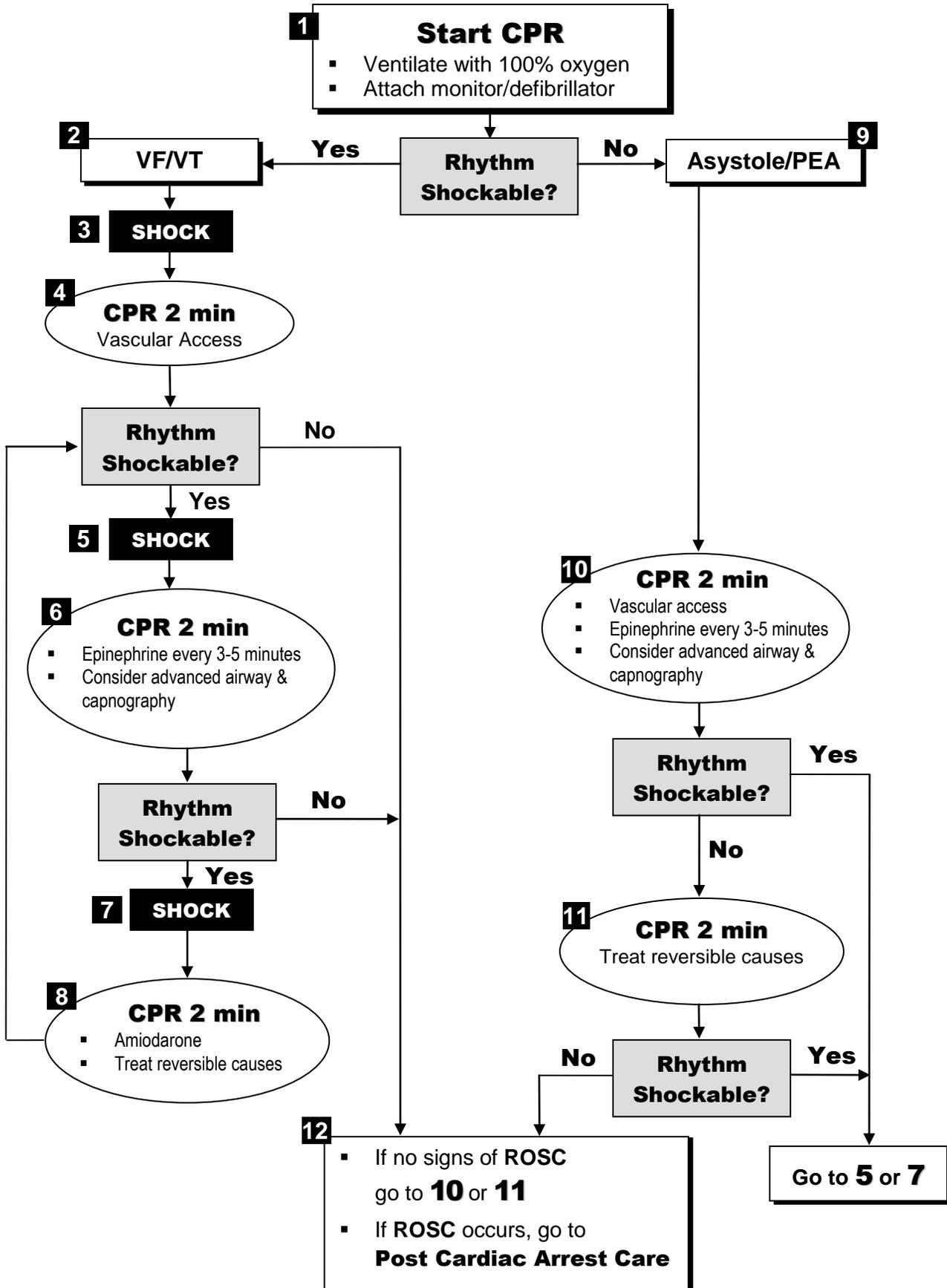
Notes: If severe hypothermia precedes cardiac arrest (See Adult Medical Section – Hypothermic Cardiopulmonary Arrest)

Placement of an advanced airway should be delayed if BVM ventilation is effective. Once an advanced airway (such as ET or King Airway) is in place, the patient should receive continuous compressions (at least 100/minute) without pauses for ventilation. The ventilating rescuer should provide one breath every 6-8 seconds while patient is pulseless, then 1 breath every 5-6 seconds with ROSC.

ADULT CARDIAC ARREST MANAGEMENT

- ETT** **Establish unresponsiveness, ineffective breathing, and no pulse**
(for 10 seconds)
Provide CPR – 5 cycles (approximately 2 minutes)
Ventilate via BVM / 100% oxygen – use recommended BLS parameters – provide just enough volume for visible chest rise (approximately 500-600 ml or ½ volume of BVM)
Utilize AED
Note: Prioritize immediate use of AED if arrest is witnessed, known to be of less than 5 minutes duration or if competent CPR is in progress on EMS arrival
- EMT-2** **Establish vascular access**
King Airway placement (advanced airway may be delayed if BVM ventilation is effective)
- EMT-3** **Determine rhythm via EKG monitor** (See Adult Cardiac Arrest Algorithm – this section)
Consider advanced airway (if not already established)
- Additional considerations during cardiac arrest management:
- ETT** **If patient is hypothermic** (core temperature <86°F) follow **Hypothermia Protocol**
(See Adult Medical Section – Hypothermic Cardiopulmonary Arrest)
- EMT-2** If hypovolemia is suspected, administer **20 ml/kg bolus** NS (up to 1 L) repeat until ROSC
If narcotic OD is suspected, administer **Narcan 2 mg** IV/IO or IN after ROSC
If patient is hypoglycemic (BGL <60), administer **dextrose 50% (D₅₀) 25 g** slow IV/IO
(after BLS interventions have been initiated)
- EMT-3** **Consider Reversible Causes** of cardiac arrest (6 **Hs & Ts**)
If ROSC is established (See Adult Immediate Post-Cardiac Arrest Care – this section)
In cardiac arrest of pregnant patient (See Adult Cardiac Arrest Algorithm Notes – this section)
- EMT-3A** If tension pneumothorax is suspected, perform **needle chest decompression**
(See Appendix – Needle Chest Decompression)
Sodium bicarbonate 1 mEq/kg IV/IO (max 50 mEq) may be given during cardiac arrest for:
- Tricyclic Antidepressant (TCA) overdose
 - Known or suspected hyperkalemia / potassium overdose
 - Acidosis
 - Cocaine-induced refractory VT or VF
- The following medications may be administered via ET tube if vascular access is **not** established (ET dosages are 2 to 2½ times IV dosages):
- Epinephrine 1:1000 2-2.5 mg** ET
Lidocaine 2-3 mg/kg ET
Narcan 4 mg ET

ADULT CARDIAC ARREST ALGORITHM



(See notes for this algorithm – next page)

ADULT CARDIAC ARREST ALGORITHM – NOTES

CPR Quality:

- Push hard (≥ 2 inches / 5 cm), and fast (at least 100/minute), and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressors every 2 minutes
- If no advanced airway, 30:2 compression to ventilation ratio
- Defibrillate when indicated – do not delay defibrillation for adjunct therapies
- (EMT-3A) Monitor EtCO₂ for patients with advanced airways – if reading falls below 10 mmHg, attempt to improve quality of CPR
- Do not compromise CPR or compression quality to implement adjunct therapies or move the patient

Return of Spontaneous Circulation (ROSC):

- Observe presence of pulse and blood pressure
- Note abrupt increase in EtCO₂ (typically ≥ 40 mmHg)

Shock Energy:

- Rectilinear biphasic – **120 J, 150 J, 200 J**

Drug Therapy for pulseless patients:

(EMT-3)

- Epinephrine IV/IO dose – **1 mg** bolus every 3-5 minutes
 - Epinephrine ET dose – **2 to 2.5 mg** every 3-5 minutes
 - Amiodarone IV/IO dose – **300 mg** bolus (2nd dose 150 mg bolus after 3-5 minutes)
- Notes:** Amiodarone for a pt with pulses, must be given at slower rate & alternate dose (See Medication Section – Amiodarone)
Use lidocaine 1-1.5 mg/kg IV/IO or ET (2x dose) when known contraindications to amiodarone exist

(EMT-3A)

- Magnesium sulfate IV/IO dose – **2 g** slow push is the drug of choice for pulseless Torsades de Pointes
- Glucagon IV/IO dose – **5 mg** bolus if patient is taking beta-blockers or calcium channel blockers
- Sodium bicarbonate IV/IO dose – **1 mEq/kg** bolus for known or suspected TCA, cocaine or K⁺ OD, or hyperkalemia

Advanced Airway:

- (EMT-2) Advanced airway placement should be deferred during initial phases of resuscitation if BVM ventilations are effective
- (EMT-3A) Where available, utilize capnography to confirm and monitor ET tube placement
- Pulseless patient – 1 breath every 6-8 seconds with continuous chest compressions. After ROSC – 1 breath every 5-6 seconds

Reversible Causes

(6 Hs & Ts):

- | | |
|------------------------------------|------------------------------------|
| ▪ H ypoxia | ▪ T oxicity (drug overdose) |
| ▪ H ypovolemia | ▪ T ension pneumothorax |
| ▪ H ypo/hyperkalemia | ▪ T amponade (cardiac) |
| ▪ H ypothermia | ▪ T hrombus (cardiac/AMI) |
| ▪ H ydrogen ions (acidosis) | ▪ T hrombus (pulmonary/PE) |
| ▪ H ypoglycemia | ▪ T rauma |

Provide intervention(s) appropriate to suspected cause of arrest

Transport / Medical Control Contact:

During the initial phases of cardiac arrest, performing high-quality BLS/ACLS interventions takes priority over transport and establishing contact with Medical Control. Normally, transport and Medical Control contact are implemented with ROSC; however, Medical Control contact / transport can be initiated sooner, if they do not interfere with necessary available BLS/ACLS interventions or if input from Medical Control is needed for guidance. In a normothermic cardiac arrest, consider Medical Control contact if ROSC is not obtained after 30 minutes of appropriate ACLS interventions.

Cardiac Arrest of Pregnant Patient:

Notes: In 2nd and 3rd trimester patients, perform chest compressions with the hands placed higher on sternum than on non-pregnant patients (patient should be placed in supine position). To relieve aorto-caval compression during CPR, manually displace the uterus to the patient's left.

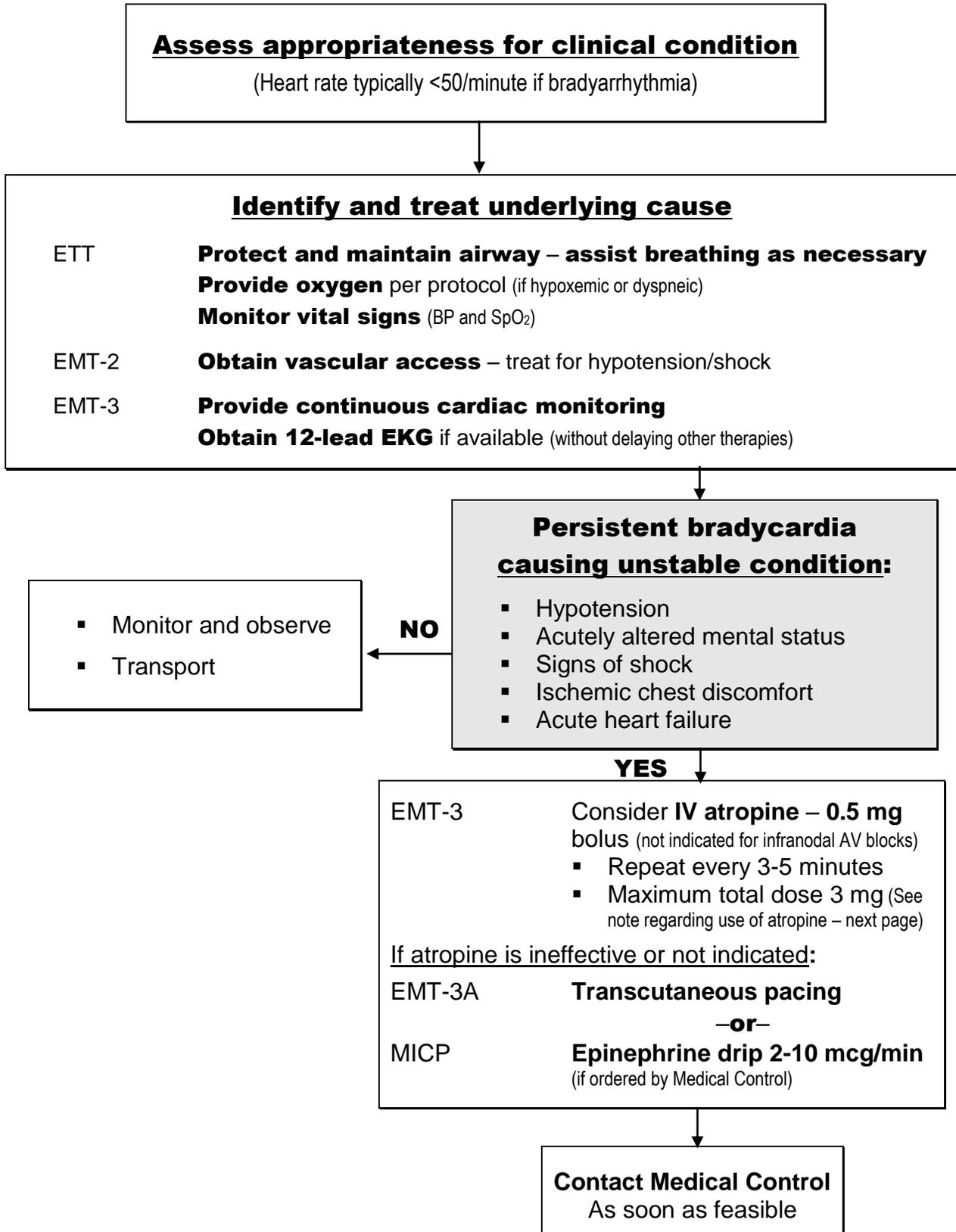
IV access in these patients should be established above the diaphragm, if possible (Humeral site for IO is preferred)

If the patient is on a magnesium drip – stop drip immediately

Defibrillation indications and settings are the same as for non-pregnant patients (if fetal monitoring equipment is in place, remove prior to defibrillation if feasible, but do not delay defibrillation for this intervention).

Notify receiving hospital as soon as possible to prepare for a possible resuscitative caesarean section, which can enhance survivability of both the mother and fetus.

ADULT BRADYCARDIA ALGORITHM (With Pulse)



(See notes for this algorithm – next page)

ADULT BRADYCARDIA ALGORITHM – NOTES

Information regarding use of atropine:

- Atropine is not indicated for infranodal AV blocks including:
 - 2nd degree type II AV heart block
 - 3rd degree AV heart block
- Atropine is not indicated for wide-complex ventricular escape beats when pacing is available
- Atropine can be detrimental to patients with Acute Coronary Syndrome (ACS):
 - It should not be used in ACS with mild bradycardia without signs of shock
 - If in doubt, contact Medical Control
- Heart transplant patients will not respond to atropine
- Atropine may be administered via ET tube at 2x the IV/IO dose, only if IV/IO access is not available. (Maximum total dose 3 mg/kg)

Note: For certain toxicological problems such as organophosphate poisoning, more than 3 mg of atropine may be needed. Contact Medical Control if more than 3 mg atropine is required.

Additional medication therapies:

- If an unstable patient has chronic renal failure and / or hyperkalemia is suspected, contact Medical Control for possible authorization to administer **sodium bicarbonate 1 mEq/kg** slow IV/IO (maximum 50 mEq)
- For suspected β -blocker or calcium channel blocker overdose, contact Medical Control to obtain orders for **glucagon 5 mg IV** (See Medication Section – Glucagon)
- (MICP only) If bradycardia does not respond to atropine, contact Medical Control for possible orders to initiate **epinephrine drip** – the usual initial dose is 2-10 mcg/minute. (See Medication Section – Epinephrine 1:10,000 for instructions to prepare drip)

Notes: The algorithm on the previous page is intended for the patient with a bradycardic rhythm that is the cause of poor perfusion.

For cases where the bradycardia results in profoundly inadequate perfusion and unconsciousness - **CPR should be performed.**

If severe hypothermia precedes bradycardia, defer pacing/medications until rewarming has been implemented, and core temperature is $\geq 86^{\circ}\text{F}$, unless otherwise ordered by Medical Control. (See Adult Medical Section – Hypothermia Without Cardiac Arrest)

Provide pain control, as time allows, during transcutaneous pacing. (See Adult Medical Section – Pain control -or- Appendix – Special Circumstances Pain Control)

ADULT RAPID DYSRHYTHMIA¹ ALGORITHM (With Pulse)

Assess appropriateness for clinical condition

(Heart rate typically ≥ 150 /minute if rapid dysrhythmia)

Identify and treat underlying cause

- | | |
|-------|--|
| ETT | Protect and maintain airway – assist breathing as necessary
Provide oxygen per protocol (if hypoxemic or dyspneic)
Monitor vital signs (BP and SpO ₂) |
| EMT-2 | Establish vascular access |
| EMT-3 | Provide continuous cardiac monitoring – identify rhythm
Obtain 12-lead EKG if available (without delaying other therapies) |

Persistent rapid dysrhythmia causing unstable condition:

- Hypotension
- Acutely altered mental status
- Signs of shock
- Ischemic chest discomfort
- Acute heart failure

Unstable Patient

Consider Synchronized Cardioversion
(See Note 2 – next page)

YES

NO

Stable Patient

In Narrow-complex Rapid Dysrhythmia
(See Note 4 – next page)

NO

Wide QRS?
 ≥ 0.12 seconds

YES

Stable Patient

In Wide-complex Rapid Dysrhythmia
(See Note 3 – next page)

Rapid Dysrhythmias from toxicity due to:

- Cocaine
- Amphetamines
- Tricyclic Antidepressants

(See Notes 5 & 6 – next page)

ADULT RAPID DYSRHYTHMIA ALGORITHM - NOTES

Note 1: Sinus tachycardia (rate usually <150 bpm):

- This is not a dysrhythmia, but is the heart's response to a physiologic stressor (infection, dehydration, anxiety, etc.)
- Antidysrhythmics and cardioversion do not relieve sinus tachycardia
- These pts require supportive care / assessment to identify & treat the stressor contributing to the sinus tachycardia

Note 2: Consider synchronized cardioversion (EMT-3A):

- Cardioversion is not indicated for **sinus tachycardias**, **ectopic atrial tachycardias** (which often result from toxin or drug-induced cardiac irritability) or **multifocal atrial tachycardia**
 - If HR <150, emergent cardioversion is usually not indicated. Consult Medical Control, if feasible, prior to cardioverting a patient with HR <150
 - Cardioversion of atrial fibrillation can result in embolic complications (i.e. stroke). Contact Medical Control, if feasible, before cardioverting a patient with atrial fibrillation
 - If time allows, unstable patients with narrow-complex tachycardias thought to be re-entrant SVT can be given a trial of adenosine
 - If symptoms are mild or borderline, and the dysrhythmia is known, a brief trial of medications can be attempted prior to cardioversion for the following:
 - **Narrow-complex dysrhythmias** (QRS <0.12 seconds)
 - Re-entrant SVT – adenosine (EMT-3A)
 - Refractory SVT⁷ - diltiazem after Medical Control consult¹ (MICP)
 - A-fib with RVR – diltiazem after Medical Control consult¹ (MICP)
 - **Wide-complex** (QRS ≥ 0.12 seconds) **SVT or rhythms of unclear type**
 - Medications should be guided by Medical Control consult² (MICP)
 - **VT with pulse** – lidocaine (EMT-3) or amiodarone (MICP)
 - **Torsades de Pointes**³ (with pulse) – magnesium sulfate (EMT-3A – with Medical Control order)
 - Cardioversion energy levels
 - **SVT & A-flutter** – 50 J / 100 J / 200 J
 - **Atrial fibrillation with RVR** – 120 J / 200 J
 - **VT with pulse** – 100 J / 200 J
 - **Torsades de Pointes**³ – defibrillate at 120 J / 150 J / 200 J (Unsynchronized)
- If time allows, provide sedation prior to synchronized cardioversion (See dosing, Fentanyl & midazolam – next pg)

Note 3: Stable patient in wide-complex (QRS ≥ 0.12 seconds) **rapid dysrhythmia:**

- Contact Medical Control in all cases as soon as feasible⁴
- Consider antidysrhythmic infusion if dysrhythmia is identified:
 - **VT with pulse** – lidocaine (EMT-3) or amiodarone (MICP) administered slowly
 - **Re-entrant SVT w/aberrancy** (regular, monomorphic, Hx compatible⁵) – vagal maneuvers (EMT-3A), adenosine² (MICP – with Medical Control order)
 - **Torsades de Pointes**³ – magnesium sulfate (EMT-3A – with Medical Control order) administered slowly
 - **Wide-complex tachycardia of unclear type**
 - Medications should be guided by Medical Control consult⁶ (MICP)
- If etiology unclear or contraindications to antidysrhythmics exist, contact Medical Control for management options
- Reassess patient often for signs of instability or rhythm changes – go to appropriate algorithm if changes develop

Note 4: Stable patient in narrow-complex rapid dysrhythmia:

- Consult Medical Control in all cases as soon as feasible⁴
- Consider Tx options if dysrhythmia is identified (vagal maneuvers, 12-lead EKG and Hx can assist identification):
 - **Sinus tachycardia** – See Note 1 above
 - **Re-entrant SVT** – Vagal maneuvers (EMT-3), adenosine (EMT-3A)
 - **Refractory re-entrant SVT**⁷ – diltiazem (MICP – with Medical Control order)
 - **Atrial fibrillation with RVR** – if symptomatic, diltiazem (MICP)
- If etiology of dysrhythmia is unclear or contraindications to antidysrhythmics exist, consult Medical Control to discuss management options
- Serially reassess pts for development of instability or rhythm changes – go to appropriate algorithm if changes occur

Note 5: Cocaine or amphetamine-induced rapid dysrhythmia (EMT-3A):

- Can be treated with benzodiazepines (See dosing information for diazepam and midazolam – next page)

Note 6: Cocaine or tricyclic antidepressant-induced VT (EMT-3A):

- Can be treated with sodium bicarbonate (See dosing information for sodium bicarbonate – next page)

ADULT RAPID DYSRHYTHMIA ALGORITHM - NOTES

- 1 Diltiazem must be given slowly, and can cause hypotension and decreased cardiac output; therefore it may be unsuitable for unstable patients
- 2 Patients with wide-complex SVT or rhythms of unclear type can become more unstable with administration of AV-nodal blocking drugs (adenosine, diltiazem). Do not administer these drugs to patients with wide-complex tachycardias unless clear communication and direction is given by Medical Control (MICP).
- 3 "Torsades de Pointes" refers to polymorphic ventricular tachycardia and a prolonged Q-T interval baseline EKG
- 4 Antidysrhythmics may be withheld pre-hospital for minimally symptomatic patients who are unlikely to deteriorate or if dysrhythmia is transient or intermittent.
- 5 "History compatible" means the patient's dysrhythmia has previously been identified as a wide-complex SVT that converts with adenosine.
- 6 Patients with stable wide-complex tachycardias of unclear type should have therapy directed by Medical Control. Consult Medical Control as soon as feasible and relay information including 12-lead EKG findings, whether rhythm is regular/irregular, whether rhythm is monomorphic/polymorphic and clinical history gathered. Clear communication and direction from Medical Control should be used to guide treatment for stable wide-complex tachycardias of unclear type.
- 7 "Refractory re-entrant SVT" refers to re-entrant SVT not responding to vagal maneuvers or adenosine

MEDICATION DOSAGE INFORMATION (for patients with pulses)

(For more information, including important items such as contraindications, etc. See Medication Section – Drug Formulary Pages)

Be prepared to administer electrical therapy before administering antidysrhythmic medications.

Adenosine

(EMT-3A)

1st dose **6 mg** rapid IV/IO bolus with NS flush

2nd & 3rd doses **12 mg** each, rapid IV/IO bolus with NS flush

Amiodarone

(MICP)

For patients with pulses:

150 mg slow IV/IO over 10 minutes (repeat once if VT recurs)

Monitor patient for worsening hypotension, development of heart conduction block or bradycardia – discontinue infusion and contact Medical Control with assessment if these occur

Lidocaine

(EMT-3)

1.0-1.5 mg/kg slow IV/IO (over 1 minute – repeat as needed at 5-10 minutes)

Repeat doses **0.5-0.75 mg/kg** (maximum total 3 mg/kg)

Diazepam

(EMT-3A)

5 mg slow IV/IO (over 30-60 seconds – may repeat same dose once in 5 minutes if indications continue – contact Medical Control if additional diazepam is needed)

Diltiazem

(MICP)

20 mg slow IV/IO (over 2 minutes – may repeat same dose in 15 minutes if dysrhythmia continues)

Monitor for worsening hypotension, heart block and bradycardia – discontinue infusion and contact Medical Control with assessment if these occur

Magnesium sulfate

(EMT-3A)

1-2 g (mixed in 100ml NS) IV/IO infusion (over 5-20 minutes)

Monitor for worsening hypotension, development of heart conduction block, bradycardia or respiratory insufficiency – discontinue infusion and contact Medical Control with assessment if these occur

Midazolam

(EMT-3A)

2.5 mg slow IV/IO (over 2 minutes) or IN (repeat only by Medical Control order)

Sodium bicarbonate

(EMT-3A)

1 mEq/kg slow IV/IO (over 1-5 minutes – maximum 50 mEq)

Fentanyl

(EMT-3A)

1 mcg/kg slow IV/IO (over 1 minute) or IN (repeat only by Medical Control order)

ADULT IMMEDIATE POST-CARDIAC ARREST CARE

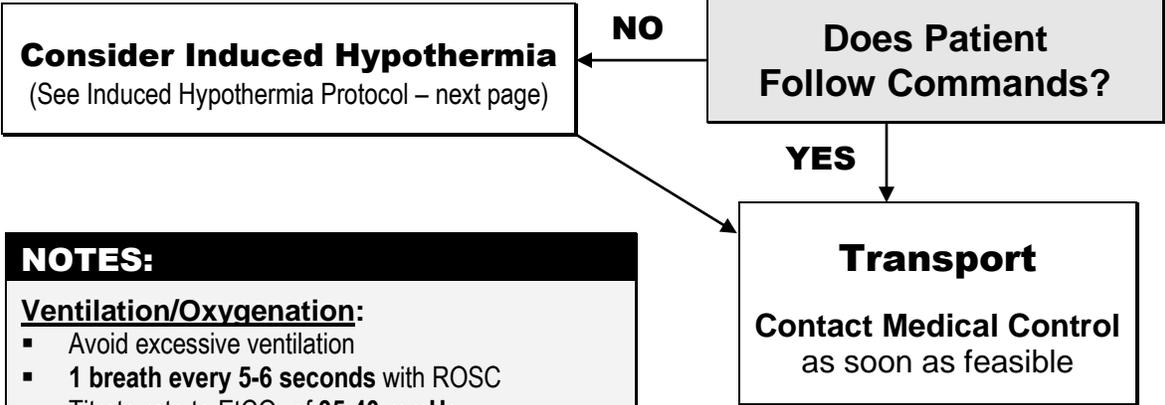
Return of Spontaneous Circulation (ROSC)
 Contact Medical Control and post-resuscitative care resources ASAP

Optimize Ventilation and Oxygenation

- Maintain oxygen saturation at 94% to 99%
- Consider advanced airway placement and capnography
- Do not hyperventilate

Treat Hypotension (SBP <90 mmHg)

- Administer IV/IO fluid bolus – establish 2nd vascular access site
- Consider reversible causes
- Obtain 12-lead EKG (notify receiving hospital ASAP if STEMI or presumably new LBBB is identified¹)
- Treat dysrhythmias using appropriate protocols
- (MICP) Consult Medical Control for possible epinephrine drip for cardiogenic shock not responsive to IV fluid resuscitation (See Medication Section – Epinephrine 1:10,000)



NOTES:

Ventilation/Oxygenation:

- Avoid excessive ventilation
- **1 breath every 5-6 seconds** with ROSC
- Titrate rate to EtCO₂ of **35-40 mmHg**

IV fluid bolus:

- NS boluses – 5 to 20 ml/kg if needed for shock

Reversible Causes (6 H's & T's):

H ypoxia	T oxins
H ypovolemia	T ension pneumothorax
H ydrogen Ions (acidosis)	T amponade (cardiac)
H ypo/hyperkalemia	T hrombus (cardiac)
H ypothermia	T hrombus (pulmonary)
H ypoglycemia	T rauma

Notes: All post-arrest patients with STEMI, presumed new LBBB or high suspicion of AMI (with coronary artery occlusion) should be transported to a receiving hospital capable of immediate PCI, if feasible.

Patients in recurrent arrest should be taken to the closest hospital.

Consider aeromedical transport when it allows arrival to appropriate hospital significantly faster (>30 minutes sooner) than ground transport. Ground transport patients should be taken to MSRMC unless Medical Control orders alternate destination.

POST-CARDIAC ARREST THERAPEUTIC HYPOTHERMIA

Inclusion Criteria: Patient with ROSC following cardiac arrest who does not have a meaningful response to verbal stimuli (follows commands), **and**
Post-arrest temperature must be >94°F

Exclusion Criteria: (Unless otherwise ordered by Medical Control)
Patient known to be pregnant
Trauma patients or those with known active bleeding
Patients who have had major surgery within last 14 days
Patients with suspected sepsis
Patients with SBP <90 mmHg
Patient is unable to follow commands for reasons other than cardiac arrest (i.e. drug intoxication, prolonged seizure)

Note: Contact Medical control for clarification and to discuss management, as some of these patients could benefit from post-resuscitative hypothermia, despite these relative contraindications.

Special Circumstances: For patients with ROSC when hypothermia preceded cardiac arrest, who are unable to follow commands, rewarm core to target temperature of 90-94°F. Contact Medical Control if baseline rectal temperature is <94°F, to discuss management options.

Procedure:

EMT-1

- Obtain baseline GCS (verify patient cannot follow commands)
- Assess VS (verify SBP >90 mmHg)
- Assess rectal temperature (ensure baseline >94°F)
- Apply ice packs wrapped in towels to axillae, groin & neck (reposition every 10-15 min. replace as needed)

EMT-3

- Infuse 30 ml/kg (up to 2 L maximum) of chilled (4°C) NS over 20 minutes
- Provide continuous cardiac monitoring while administering chilled saline (discontinue infusion if hemodynamically significant dysrhythmias develop)
- Consider anti-shivering agents if shivering occurs and: the patient has an advanced airway, vascular access site, continuous cardiac monitoring, and SBP >100 mmHg. Anti-shivering agents include **one** of the following:
 - **Midazolam – 0.05 mg/kg** (maximum single dose 2.5 mg) IN (EMT-3) slow IV/IO (EMT-3A) (may repeat once in 5 minutes at same dose if shivering continues and SBP >100 mmHg – contact Medical Control if additional is needed)
 - **Fentanyl – 1 mcg/kg** slow IV/IO (may repeat once in 5 minutes at same dose if shivering continues and SBP >100 mmHg – contact Medical Control if additional is needed)
 - **Diazepam – 0.2 mg/kg** (maximum single dose 5 mg) slow IV/IO (may repeat once in 5 minutes at same dose if shivering continues and SBP >100 mmHg – contact Medical Control if additional is needed)
- Monitor VS, oxygenation, cardiac rhythm, and provide supportive care
- Monitor rectal temperature every 30 minutes, and discontinue cooling measures for rectal temperature <90°F

MAT-SU BOROUGH EMS



Section 2

ADULT RESPIRATORY Protocols

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OXYGEN THERAPY

NO PATIENT IN RESPIRATORY DISTRESS IS TO BE DENIED OXYGEN THERAPY

GENERAL GUIDELINES – ADULT PATIENTS:

Other conditions for which supplemental oxygen is indicated include:

- Decreased LOC
- Unstable vital signs
- Shock
- Suspected ACS
- Stroke, and many other conditions

Oxygen is not needed for every patient, but if there is any doubt as to whether it is needed, it is better to administer oxygen than to withhold it.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) PATIENTS:

Institute oxygen therapy for COPD patients as follows:

Unstable patients (those who demonstrate respiratory distress or shock-like symptoms):

Administer oxygen to these patients via an appropriate delivery device (NRB, BVM, etc.)

Note: If a patient is not breathing adequately on his or her own, the treatment of choice is **POSITIVE PRESSURE VENTILATION via BVM**, with supplemental oxygen.

For unstable patients, achieving adequate oxygenation must take priority over careful titration of oxygen levels, because harm is more likely to result from hypoxia than from excess oxygen. However, when time allows, the best patient care requires that oxygen use be guided by patient assessment including mental status, vital signs, and pulse oximetry.

Often individuals with COPD know their “baseline” or usual oxygen saturation measurement. This, in conjunction with patient assessment, should be the target oxygen therapy level for these individuals.

Stable patients (those who are NOT in respiratory distress, who are on home oxygen):

These patients should continue to receive oxygen therapy at their usual dose. If they are in respiratory distress, their oxygen should be increased as needed.

Notes: Closely monitor the COPD patient receiving high concentrations of oxygen for signs of decreased LOC and/or increased respiratory distress – be prepared to provide ventilations if indicated.

100% oxygen therapy should be administered for possible carbon monoxide exposure. Furthermore, in women who may be pregnant 100% oxygen is needed to clear CO from the fetus, even if pre-hospital testing shows the mother’s CO levels to be low or absent.

Excessive concentrations of oxygen delivered to post-arrest patients have been shown to result in worsened outcomes. When possible, oxygen administration should be titrated in post-arrest patients to achieve pulse oximetry readings between 94% and 99%.

Target oxygen saturation for ACS and CVA patients is $\geq 94\%$. If there is evidence that the patient requires increased respiratory effort to generate this saturation level, then supplemental oxygen should be administered. Supplemental oxygen may not be required for patients with saturations consistently $>94\%$, who have normal respiratory rate/effort, and no evidence of respiratory distress. If in doubt, administer oxygen.

COMPLETE AIRWAY OBSTRUCTION (Adults and Children ≥ age 1)¹

Air Exchange Poor or None	Signs and Symptoms
SEVERE² BLOCKAGE Responsive	<ul style="list-style-type: none"> • Clutching throat • Patient cannot cough or make any sound • Blue lips, nails, skin <p>Treatment guidelines</p> <ul style="list-style-type: none"> • Quickly ask, “are you choking?” If the patient nods yes or is unable to speak, cough or cry – act quickly! • Stand behind an adult or kneel behind a child • Make a fist. Place thumb side against patient’s abdomen, just above the navel • Give quick, inward and upward thrusts until object is expelled or the patient becomes unresponsive
Obese or late stages of pregnancy	<p>Treatment guidelines</p> <ul style="list-style-type: none"> • Perform chest thrusts – stand behind the patient • Place your arms under the patient’s armpits, encircling the chest – place the thumb side of your fist on the middle of the sternum • Grasp your fist with your other hand and thrust backward – continue until the object is expelled or the patient becomes unresponsive
Self	<p>Treatment guidelines</p> <ul style="list-style-type: none"> • Give yourself abdominal thrusts until the object is expelled • If that does not work, press your abdomen quickly over any firm surface (back of chair, side of table, etc.)
Unresponsive	<p>Treatment guidelines</p> <ul style="list-style-type: none"> • Carefully lower the patient to the ground • Open the airway – remove the object if you can see it • Begin CPR (do not perform a pulse check) • Each time the airway is opened for rescue breaths, look for an object in the patient’s throat – if you see it, remove it (do not perform blind finger sweeps)

Caution! Abdominal thrusts have been associated with severe and fatal complications. Complications may occur even when abdominal thrusts are performed correctly. DO NOT perform the Heimlich ManeuverSM on an adult or child unless it is necessary. A patient who had an airway obstruction that was removed by abdominal or chest thrusts should be evaluated by a physician to assure no internal injuries resulted from the event.

Note 1: For infants, deliver repeat cycles of 5 back-blows followed by 5 chest compressions until the object is expelled or the victim becomes unresponsive. If unresponsive, begin CPR as described above.

Note 2: If the obstruction is mild, do not interfere. Allow the victim to clear their airway by coughing while you observe for signs of severe airway obstruction.

RESPIRATORY DISTRESS DUE TO

Asthma/COPD/Emphysema

At any time, if respirations begin to decrease in rate or depth with a change in mental status, begin to assist ventilations immediately.

Place an advanced airway if necessary.

Routine EMS Care

- ETT **Provide oxygen** per protocol
Assess vital signs (with particular attention to lung sounds)
Provide respiratory support as needed via BVM and supplemental oxygen
Gather pertinent medical history - "OPQRST" & "SAMPLE":
 Known respiratory condition
 Known cardiac condition (For wheezing of suspected cardiac origin, See Cardiac Section –
 Trauma Respiratory Distress due to CHF / Pulmonary Edema)
 COPD/smoker
 Review patient medications (Is patient compliant with medications?)
- EMT-1 **May administer a patient's own prescribed medications** if higher level of care is not available (See Appendix – Administration of Patient's Own Medication)
- EMT-2 **Give 1st dose albuterol 2.5 mg / Atrovent 0.5 mg** then re-assess (See Note¹ – next page)
If dyspnea and wheezing continue, give 2nd dose **albuterol 2.5 mg / Atrovent 0.5 mg** then re-assess. Give 3rd dose if indicated (See Note² – next page)
Consider CPAP (See Appendix – Continuous Positive Airway Pressure)
Establish vascular access – NS 250 ml bolus (unless signs of fluid overload are present)
Contact Medical Control for further orders
- EMT-3 **Provide continuous cardiac monitoring** for:
 ▪ Potentially unstable patients, patients with abnormal VS or those with hypoxemia
 ▪ Patients who have received more than two doses of bronchodilators
 ▪ Patients with a history of cardiac disease
 ▪ Patients who have received magnesium sulfate (See Note³ – next page)
If dyspnea continues or worsens, consider **IM epinephrine** (See Note⁴ – next page)
- EMT-3A For refractory reactive airway disease in patients taking β -blockers, consider **IV/IO glucagon** (See Note⁵ – next page)
For refractory reactive airway disease, contact Medical Control to discuss administration of **magnesium sulfate**. Dosing will be guided by Medical Control – a usual dose is **2 g IV/IO** (over 20 minutes) (See Note³ – next page)
If respiratory distress continues despite bronchodilator therapy, give **Solu-Medrol 125 mg** slow IV/IO (over 1-2 minutes)
Notes: If severe dyspnea is present, additional bronchodilator therapy should be prioritized over administration of Solu-Medrol and magnesium sulfate
 If pneumonia or sepsis is suspected, do not administer Solu-Medrol without Medical Control direction
- MICP For refractory reactive airway disease, consider **magnesium sulfate 2 g IV/IO** (over 20 minutes) (See Note³ – next page) Contact Medical Control if alternate dose is felt necessary

(See notes for this protocol – next page)

RESPIRATORY DISTRESS DUE TO

Asthma/COPD/Emphysema

NOTES

- Note 1:** If a patient has a contraindication to either albuterol or Atrovent, the other medication may be administered alone, instead of in combination.
- Note 2:** (EMT-2) Contact Medical Control if more than three doses of nebulized bronchodilators are needed. If delay in contacting Medical Control is potentially detrimental to a critical patient, EMT-2 and above may administer additional bronchodilator treatments as needed every 15 minutes. Contact Medical Control as soon as feasible. Many patients with asthma/COPD/emphysema will require more than two doses of bronchodilators during transport.
- Note 3:** (EMT-3A) Magnesium sulfate is a weak bronchodilator and may be more effective for younger asthmatics than for older patients or those with COPD. Albuterol and Atrovent are generally more effective, with fewer side effects. **Magnesium sulfate 2 g IV/IO** over 20 minutes may be administered, with continuous cardiac monitoring, after authorization by Medical Control. If patient develops hypotension, bradycardia, heart conduction block or respiratory insufficiency, the magnesium infusion should be discontinued. Reassess the patient, give supportive care and contact Medical Control as soon as possible.
- Note 4:** (EMT-3) **0.3 mg IM epinephrine 1:1000** may be administered to younger asthmatics (< age 50) but is generally less effective and has more serious side effects than albuterol and Atrovent. For subsequent dosing information (See Medication Section – Epinephrine 1:1000)
- Note 5:** (EMT-3A) Contact Medical Control for **glucagon 5 mg IV/IO** for refractory reactive airway disease in patients taking β -blockers. (See Medication Section - Glucagon)

PNEUMONIA

Patients at risk for pneumonia include: elderly or pediatric patients with history of upper respiratory infections, patients with other respiratory conditions or compromised respiratory systems, and patients at risk for aspiration (i.e. paralyzed or stroke patients with neurological deficiencies) due to limited ability to protect their own airway.

Although there is no way to assess definitively for pneumonia in the field, it is appropriate to be suspicious of the condition, and be able to provide simple treatment that can bring significant relief to the patient.

Symptoms that may indicate pneumonia:

- Respiratory distress and history of recent URI (upper respiratory infection)
- Respiratory distress and past history of pneumonia
- Wheezing, rales and rhonchi
- Productive cough (green, yellow or brown colored mucus)
- Dry, nonproductive cough
- Fever
- Altered mental status
- Positive orthostatic changes (patient becomes dizzy when sitting upright or standing)

The symptoms listed above may also be indicative of other respiratory conditions, so the EMS provider must perform a complete patient assessment, consider all possible causes of respiratory distress, and provide appropriate treatment. If there is suspicion of the presence of pneumonia, the following treatment can benefit patients in respiratory distress:

<u>Routine EMS Care</u>	
ETT	<p>Provide supportive care / respiratory support Provide <u>humidified oxygen</u> per protocol Assess vital signs – with <u>particular attention to lung sounds</u> Gather pertinent medical history:</p> <ul style="list-style-type: none"> ▪ Known respiratory condition ▪ Known cardiac condition ▪ COPD/smoker
EMT-2	<p>Consider CPAP (See Appendix – Continuous Positive Airway Pressure)</p> <p><u>If bronchospasm is present,</u> (See Respiratory Distress due to Asthma/COPD/Emphysema – this section)</p> <p>Establish vascular access – NS 250 ml bolus (unless signs of fluid overload are present)</p>
EMT-3	<p>Provide continuous cardiac monitoring for patients with:</p> <ul style="list-style-type: none"> ▪ Severe dyspnea ▪ Unstable vital signs / hypoxia ▪ Decreased level of consciousness

PULMONARY EMBOLISM

Pulmonary embolism is a condition in which a blood clot, usually from the leg or pelvic veins, dislodges and travels to the pulmonary veins, obstructing blood flow in the lungs. The obstruction has the potential to progress to cardiopulmonary failure and cardiopulmonary arrest.

Pre-arrest patients often present with complaints of chest pain and/or shortness of breath. They may experience dizziness, leg swelling, cough and/or a low-grade fever. Findings by EMS may include: tachycardia, dysrhythmias or hypoxemia.

An increased index of suspicion for pulmonary embolism should be present if the patient has risk factors for this condition. Risk factors for pulmonary embolism include the following:

- **Venous stasis**
 - Bed rest
 - Lower extremity in cast/fixator
 - Recent hospitalization
 - Long distance travel
- **Hypercoagulability**
 - Pregnancy (postpartum less than 4 weeks)
 - Estrogen use (especially if more than 35 years old with cigarette use)
 - Cancer
 - Other
- **Injury state**
 - Recent major surgery
 - Recent major trauma

Routine EMS Care

ETT	<p>Provide supportive care – respiratory support</p> <p>Provide oxygen per protocol – monitor SpO₂</p>
EMT-2	Vascular access – assess for shock, treat per protocol
EMT-3	Provide continuous cardiac monitoring – including 12-lead EKG
ETT	Contact Medical Control – report index of suspicion and identified risk factors to receiving physician

SEDATION TO MANAGE PATIENT WITH ADVANCED AIRWAY

Sedation is indicated when a patient with an advanced airway (being managed per protocol) begins to “fight the tube.” In order to protect and continue managing the patient’s airway in a safe and effective manner, reconfirm tube placement and proceed as follows:

<u>Routine EMS Care</u>	
EMT-3	<p>Administer diazepam 5 mg slow IV/IO (over 1 minute) if needed for agitation (may repeat in 5 minutes if indications continue)</p> <p>Reconfirm tube placement per protocol</p> <p>Contact Medical Control for further orders</p> <p>- OR -</p> <p>Administer midazolam 2.5 mg slow IV/IO (EMT-3A) (over 2 minutes) or IN (EMT-3), if needed for agitation (may repeat at 5 minute intervals, to 10 mg total if indications continue)</p> <p>Reconfirm tube placement per protocol</p> <p>Contact Medical Control for further orders</p>
EMT-3A	<p>Monitor waveform capnography per protocol, when available</p>

MAT-SU BOROUGH EMS



Section 3 ADULT MEDICAL Protocols

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ROUTINE EMS MEDICAL CARE

Routine EMS Care

- ETT **ABCs** – address life threats immediately per appropriate protocol
- Maintain and protect airway** – use adjuncts as necessary
- Protect C-spine** at all times if any possibility of spinal injury exists
- Provide oxygen** per protocol – support ventilations as necessary
- Assess patient** – gather history, develop differential diagnosis
- Notes:** Avoid “tunnel vision” in your diagnostic impression!! Be thorough in this process and consider all possibilities
- Position patient** – place patient in position of comfort unless contraindicated
- Monitor SpO₂**
- Treat patient** – per appropriate protocol based on diagnostic impression
- Vital signs** – obtain and record every 15 minutes for stable patients and every 5 minutes for unstable patients
- EMT-2 **Obtain vascular access** – provide fluid therapy as per protocol
- EMT-3 **Provide continuous cardiac monitoring** – obtain 12-lead EKG as appropriate for patient presentation
- ETT **Transport** – determine destination hospital based upon patient condition, patient request and receiving physician orders
- Contact Medical Control as early as possible**

ALLERGIC REACTION / ANAPHYLAXIS

DESCRIPTION

Allergic reaction is a hypersensitivity to a given antigen. Anaphylaxis refers to a severe systemic reaction due to the introduction of an antigen. This reaction may include shock, laryngospasm, angioedema, and/or respiratory distress. It can be fatal.

The patient may complain of respiratory symptoms, such as tightness in the chest, wheezing or shortness of breath. Other symptoms may include swelling, urticaria, nausea, vomiting, abdominal pain or diarrhea. Serious symptoms such as hypotension and bradycardia may also result.

Anaphylaxis is a true emergency in that death may occur within minutes of the introduction of the antigen.

ALLERGIC REACTION MANAGEMENT (Stable Patient)

Hemodynamically stable patient with minor to moderate skin manifestations, mild to moderate wheezing, and without evidence of shock or immediate life threats.

Routine EMS Care

- | | |
|--------|--|
| ETT | Provide oxygen per protocol
Separate patient from offending allergen if feasible |
| EMT-1 | May administer patient's own medication – epinephrine auto-injector, bronchodilators (See Appendix – Administration of Patient's Own Medication) |
| EMT-2 | <u>If wheezing is present</u> , give albuterol 2.5 mg / Atrovent 0.5 mg via nebulizer
Repeat up to 3 doses if needed (contact Medical Control if additional nebulizer treatments are needed ¹)

Obtain vascular access - administer NS TKO |
| EMT-3 | <u>If signs of shock develop</u> , (See Anaphylactic Shock Management – next page) provide epinephrine 1:1000 0.3 mg IM for severe bronchospasm or impending upper airway obstruction, and IV therapy for signs of anaphylactic shock (contact Medical Control if more than one dose of epinephrine is needed ²)

Provide continuous cardiac monitoring |
| EMT-3A | Contact Medical Control to request orders for diphenhydramine
The usual dose is 25 mg (possibly repeating up to maximum 50 mg)
Administer via slow IV (over 1 minute) or IM

<u>If signs and symptoms of allergic reaction persist</u> , in spite of other therapies,
Contact Medical Control to request orders for Solu-Medrol 125 mg slow IV/IO |
| MICP | May administer diphenhydramine 25 mg slow IV (over 1 minute) without contacting Medical Control for patients > age 12 |

Note 1: Contact Medical Control for orders if more than three doses of nebulized bronchodilators are needed. If delay in contacting Medical Control is potentially detrimental to a critical patient, EMT-2 may administer additional bronchodilator treatments as needed every 15 minutes. Contact Medical Control as soon as feasible. Many patients will require more than three doses of bronchodilators during transport.

Note 2: If delay in contacting Medical Control is potentially detrimental to a critical patient, EMT-3 may repeat epinephrine 1:1000 IM (same dose), as needed, every 15 minutes to maximum of three doses. Contact Medical Control as soon as feasible.

ANAPHYLACTIC SHOCK / LIFE-THREATENING ALLERGIC REACTIONS

Hemodynamically unstable patient characterized by shock, or one with impending airway obstruction, severe wheezing and/or respiratory distress¹

Routine EMS Care

ETT	<p>Protect and maintain airway – assist ventilations via BVM if necessary</p> <p>Provide oxygen per protocol</p>
EMT-1	<p>Administer patient's prescribed epinephrine auto-injector for severe anaphylaxis if no contraindications are identified (See Appendix – Administration of Patient's Own Medication)</p> <p>Notes: When anaphylaxis is judged to be life threatening due to significant airway compromise, severe respiratory distress or profound hypotension; there are no contraindications for epinephrine</p> <p>In milder reactions, contact Medical Control before administration</p> <p>May administer patient's prescribed bronchodilator inhalants if shortness of breath is present (See Appendix – Administration of Patient's Own Medication)</p>
EMT-2	<p>Obtain vascular access:</p> <ul style="list-style-type: none"> ▪ Provide NS fluid bolus if shock is present (10-20 ml/kg then reassess) ▪ If shock continues without fluid overload after reassessment, repeat bolus ▪ In the absence of shock – NS 250 ml bolus, then maintain IV at TKO <p>Give albuterol 2.5 mg / Atrovent 0.5 mg via nebulizer for respiratory distress repeat up to 3 doses if needed (contact Medical Control if additional nebulizer Tx's are needed²)</p> <p>Note: Use nebulizer in combination with BVM if assisted ventilations are needed</p> <p>Consider advanced airway (King Airway may be ineffective for patients with airway edema)</p>
EMT-3	<p>Administer epinephrine 1:1000 0.3 mg IM for severe³ anaphylaxis</p> <p>Note: contact Medical Control if additional epinephrine is needed (See footnote 2 previous page)</p> <p>Provide continuous cardiac monitoring</p>
EMT-3A	<p>Prepare for ET Intubation if indications develop</p> <p>Contact Medical Control for the following:</p> <ul style="list-style-type: none"> ▪ Diphenhydramine (25-50 mg slow IV or IM – no orders required for MICP if patient >age 12) ▪ Nebulized epinephrine 1:1000 for angioedema and impending airway obstruction (usual dose for adults and children ≥ age 1 is 5 mg [5 ml] nebulized with 6 lpm O₂ children < age 1 receive 2.5 mg [2.5 ml] mixed with 2.5 ml NS) ▪ Glucagon for refractory anaphylaxis (standard dose is 5 mg IV/IO) <p>Administer Solu-Medrol 125 mg via slow IV/IO (over 1-2 minutes)</p>
MICP	<p>Epinephrine drip – dosage per medical control order only (for mixing/administration instructions see Medication Section – Epinephrine 1:10,000)</p>

Note 1: Anaphylactic shock may present without respiratory distress. Patient may also present with GI symptoms such as N/V.

Note 2: Contact Medical Control for orders if more than three doses of nebulized bronchodilators are needed. If delay in contacting Medical Control is potentially detrimental to a critical patient, EMT-2 may administer additional bronchodilator treatments as needed every 15 minutes. Contact Medical Control as soon as feasible. Many patients will require more than three doses of bronchodilators during transport.

Note 3: If signs/symptoms are mild or borderline, and relative contraindications to epinephrine exist, contact Medical Control prior to giving epinephrine, if feasible.

ALTERED MENTAL STATUS **(GCS & AVPU Scales)**

DESCRIPTION

The arousability or wakefulness of a patient is described according to the patient's response to various types of verbal or painful stimuli. Various descriptions for these responses are used including: lethargic, drowsy, stuporous, semi-comatose or comatose. Since interpretation of a single term can vary from one person to another, it is always best to describe level of consciousness using the Glasgow Coma Scale or AVPU scale. A decreased level of consciousness at any of these levels is indication for following the Altered Mental Status or Coma protocol.

There are generally only two mechanisms capable of producing stupor or coma:

1. Structural lesions that depress consciousness by destroying or encroaching upon the substance of the brain (trauma, tumor, hemorrhage)
2. Toxic-metabolic states involving either the presence of circulating toxins/metabolites or the lack of metabolic substrates (oxygen, glucose, or thiamine); these states produce diffuse depression of both cerebral hemispheres, with or without depression within the brainstem

Glasgow Coma Scale

EYE OPENING	4 – Spontaneous
	3 – To Speech
	2 – To Pain
	1 – No Response
VERBAL RESPONSE	5 – Oriented & Appropriate
	4 – Confused Conversation
	3 – Inappropriate Words
	2 – Incoherent Sounds
	1 – No Response
MOTOR RESPONSE	6 – Obeys Commands
	5 – Localizes Pain
	4 – Withdraws from Pain
	3 – Flexion Posturing
	2 – Extension Posturing
	1 – No Response

Common Reasons for Altered Mental Status:

Acidosis/Alcohol
Epilepsy
Infection/Sepsis
Overdose
Uremia (kidney failure)
Traumatic brain injury / Tumor
Insulin problem (hypoglycemia or DKA)
Psychosis
Stroke/Shock

Cardiac problems (dysrhythmia or AMI)

Other

AVPU Scale

A – Patient is alert and oriented

V – Patient responds to voice

P – Patient responds to pain

U – Patient is unresponsive

(See treatment protocol next page)

ALTERED MENTAL STATUS or COMA (Diabetic Emergencies / Drug OD)

Routine EMS Care

- ETT **Protect and maintain airway** – provide appropriate BLS interventions
Provide oxygen per protocol
Assess LOC per Glasgow Coma or AVPU scale
Gather history if possible – note relevant items in patient's vicinity.
- EMT-1 **Assess blood glucose level** (BGL)
- EMT-2 **Obtain vascular access** – Administer NS TKO unless BGL >500 or shock is present. (See Shock Treatment – This Section)
 Be prepared for advanced airway insertion if indicated
- EMT-3 **Provide continuous cardiac monitoring – provide ACLS measures** as indicated

BGL LOW <60

EMT-1 **Glucose** per protocol

EMT-2 **Dextrose 50% (D₅₀) 25 g** slow IV/IO (verify IV patent)
 If no response, consider **Narcan** (see OD protocol this page)

EMT-3 If IV access unavailable, and/or IO not appropriate
Glucagon 1 mg IM

Contact Medical Control
 Repeat medications per protocol

BGL HIGH >500

EMT-2 Monitor pt for fluid overload

Initial **NS fluid bolus of 500 ml**, then:

Continue **NS infusion at 1 liter/hour** if fluid overload not present

Consider **Narcan** per OD protocol this page for decreased LOC

Contact Medical Control

Possible Narcotic Overdose

EMT-2 **Dextrose 50% (D₅₀)** if BGL <60

Narcan 2 mg IV/IO, IM, IN or **4 mg ET** if pt is intubated
 IV is the preferred route
 Titrate to respiratory effort

Contact Medical Control

Repeat medications per protocol

Notes: Hypoglycemia usually presents with signs and symptoms of decreased LOC, seizures or stroke-like symptoms. Many individuals function normally with BGL <60. EMS dextrose is not indicated in patients who do not have signs and symptoms of hypoglycemia, even with a BGL <60.

For decreased LOC, after managing ABCs, assess BGL and if <60, treat hypoglycemia prior to administration of Narcan.

Oral glucose may be administered to conscious patients if no contraindications, such as surgical indications, exist.

For a hypoglycemic patient with decreased LOC, if IV access is not readily available, consider applying small amounts of glucose to the oral mucosa with the patient in the recovery position, or administer rectally.

DKA (Diabetic Ketoacidosis) occurs in juvenile-onset diabetics. S/S include dehydration, polydipsia, polyuria, mental status changes, Kussmaul's respirations, and elevated BGL (usually ≥250). Rehydration with supportive care as described in the BGL HIGH >500 section above is recommended

Empty medicine containers or other potentially relevant items should be transported with the patient to the receiving facility whenever possible. For additional Narcan dosing information, see Medication Section - Naloxone

HEAT EXPOSURE (HYPERTHERMIA)

DESCRIPTION

The body's normal core temperature is regulated by a number of factors that balance heat loss and heat production. As the body's temperature rises, vasodilation will lead to heat loss by radiation, convection, and conduction. However, if the temperature outside the body exceeds the temperature of the skin, this process is ineffective and evaporation by perspiration is necessary. The body's physiological response to excessive temperatures includes tachycardia as the heart attempts to increase cardiac output; sweating with subsequent loss of fluid (dehydration) and electrolytes; and signs of decreased cerebral perfusion, e.g., headache, decreased responses to verbal and/or painful stimuli.

Heat cramps: Pain in muscles due to loss of fluid and salt. Frequently affects lower extremities and abdomen. Cool, moist skin; normal to slightly elevated temperature; nausea.

Heat exhaustion: The state of more severe fluid and salt loss leading to syncope, headache, nausea, vomiting, diaphoresis, tachycardia, pallor and/or weak pulse.

Heat stroke: A very serious condition. The patient may present with hot and flushed skin, strong bounding pulse and **altered mental status** (which is an indication of organ failure). This situation may progress to coma, seizures and death.

Note: Heat stroke is a critical condition caused by a failure of the body's normal temperature regulating mechanism. This sometimes results in cessation of sweating and subsequent surface evaporation (sweating may still be present in some heat stroke patients). Heat stroke generally results when the body temperature reaches 105°F or more. A delay in cooling may result in brain damage or death. Vigorous efforts should be employed to decrease the temperature.

Any heat injury patient with decreased level of consciousness that continues despite being placed in supine position should be considered to be in HEAT STROKE.

Notes: Do not give patient oral fluids if patient is nauseated or confused

Place patient in cool environment and call for ALS

Determine the patient's past medical history and history related to present event

The core (rectal) temperature will be important in evaluating the patient, but temperature measurement must not delay aggressive cooling efforts when heat stroke is suspected

HYPOTHERMIA / COLD INJURIES

DESCRIPTION

When the body's core temperature decreases, the body will first respond by shivering. This is an attempt by the body to generate heat from muscle activity. Vasoconstriction will shunt blood from the skin, and an increase in the patient's metabolic rate will increase heat.

If these mechanisms cannot compensate for severe temperature drops, the body's systems will begin to fail: i.e. respiratory function will deteriorate and lead to hypoxemia. The patient may also develop dysrhythmias, and cardiopulmonary arrest may occur.

DEFINITIONS

Mild Hypothermia:	Clinical presentations include: patient conscious, shivering, skin pale and cold to touch
Moderate to Severe Hypothermia:	Clinical presentations include: rectal temperature 86°F or less, patient unconscious or with altered mental status, conscious patient no longer shivering, skin cold to touch. The patient may be bradycardic and hypotensive, with decreased respiratory effort.
Frostbite Injury:	Freezing of body cells – may be limited to superficial tissues or extend to the bone

(See Hypothermia / Cold Injury treatment protocols – this section)

HYPOTHERMIA WITHOUT CARDIOPULMONARY ARREST

Routine EMS Care

- ETT **ABCs** – do not delay appropriate airway procedures
Treat gently – avoid rough handling or excessive movement
Remove patient from cold environment
Assess patient for possible causes – provide supportive care
Protect C-spine at all times if any possibility of spinal injury exists
Remove all wet clothing
Prevent further heat loss – keep patient compartment warm (above 80 °F)
Provide oxygen per protocol – humidified and heated
Provide ventilatory assistance as needed – using the same parameters as for normothermic respiratory insufficiency
Apply warm packs to head, neck, armpits, groin
Assess vital signs and **body core temperature**
Assess patient for associated trauma and **medical problems**
- EMT-1 **Check BGL** (if patient exhibits altered LOC – treat per protocol if BGL <60)

Mild Hypothermia

(definition previous page)

- EMT-2 Obtain **vascular access** if pt has altered LOC, abnormal VS, or if otherwise indicated based on patient assessment
- Give **Narcan 2 mg** IV/IO, IM or IN if patient exhibits altered LOC with possible narcotic use
- EMT-3 **Provide continuous cardiac monitoring** if patient has altered LOC, abnormal VS, or if otherwise indicated based on pt assessment
- ALL Levels **Transport**
Contact Medical Control

Moderate/Severe Hypothermia

(definition previous page)

- EMT-2 **Obtain vascular access**
Give warmed **NS** (<108°F or 42°C) at rate of **10 ml/kg/hour**
- Give **Narcan 2 mg** IV/IO, IM or IN if patient exhibits altered LOC with possible narcotic use
- EMT-3 **Provide continuous cardiac monitoring** if patient has altered LOC, abnormal VS, or if otherwise indicated based on pt assessment
- ALL Levels **Transport**
Contact Medical Control

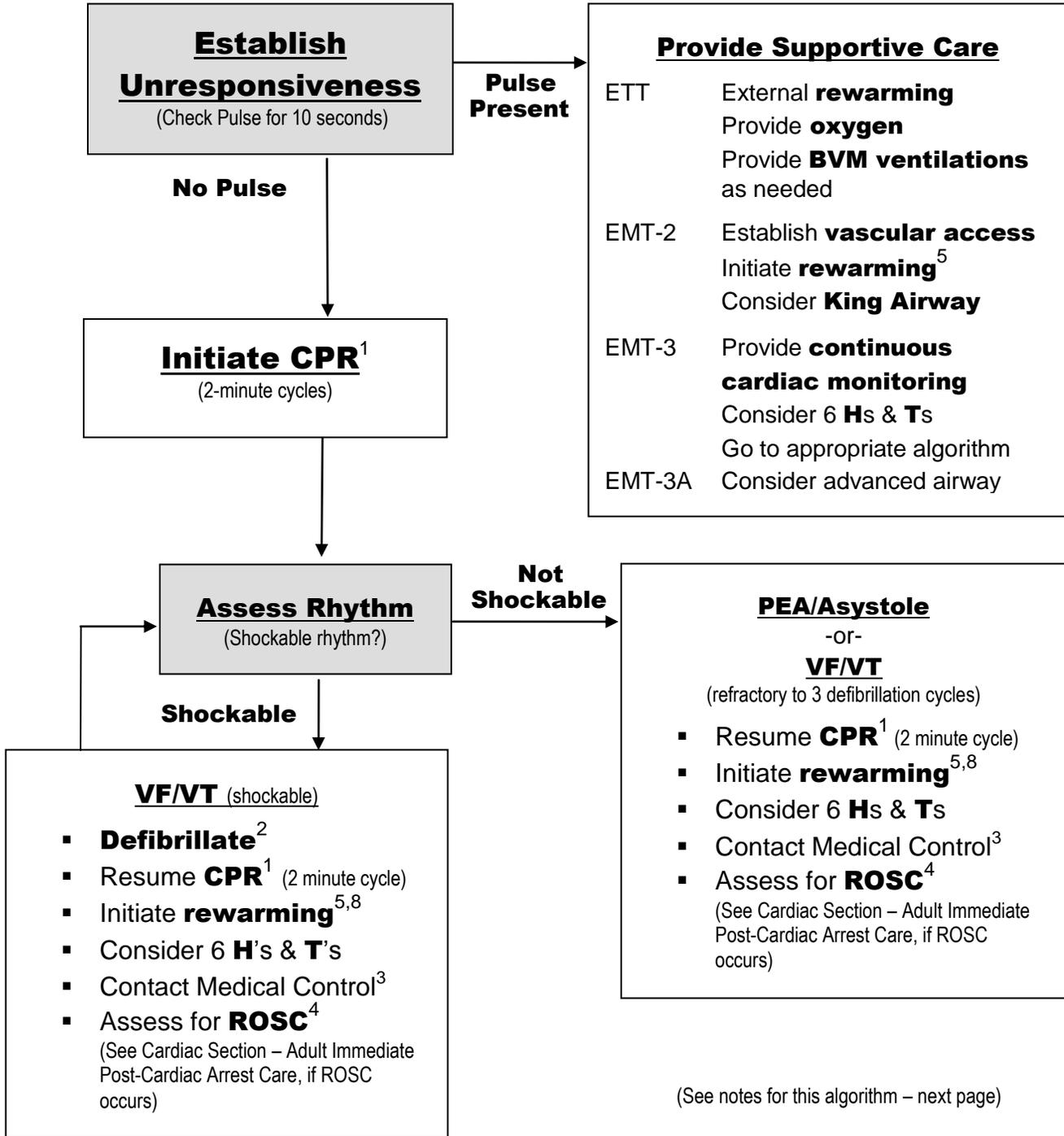
AVOID: Hyperventilation (drop in CO₂ can cause fibrillation)
Rubbing skin (can cause damage)
Rough movements (can precipitate cardiac dysrhythmias)

Notes: Do not delay appropriate procedures such as airway management or vascular access due to concern of hypothermia-induced cardiac irritability

Prioritize warming body core before extremities

HYPOTHERMIC CARDIOPULMONARY ARREST

Hypothermia precedes cardiopulmonary arrest and core temperature is <86°F (30°C)



HYPOTHERMIC CARDIOPULMONARY ARREST - NOTES

CPR/BLS during hypothermic arrest management:

- Note 1:** Follow **same parameters as normothermic CPR/BLS**
- Note 2:** When hypothermia (Core Temperature <86°F) precedes cardiac arrest, up to **3 cycles of CPR with defibrillation** may be attempted. If VF/VT is refractory to defibrillation, go to non-shockable limb of the algorithm. Further defibrillation attempts should be withheld until core temperature rises above 86°F (unless otherwise directed by Medical Control). Use same defibrillation energies as for normothermic arrest
- Note 3:** **Contact Medical Control** as soon as feasible in cases of hypothermic arrest

ROSC after hypothermic arrest:

- Note 4:** If ROSC occurs (See Cardiac Section – Adult Immediate Post-Cardiac Arrest Care)
Patients with decreased level of consciousness (unable to follow commands) should be rewarmed to a target temperature of 32° to 34°C (90-94°F)

Rewarming with hypothermic arrest management:

- Note 5:** Rewarming can include the following:
- Heated **IV fluids** (104° to 108°F) **1 L bolus**, then **10 ml/kg/hour** infusion
 - Heated oxygen
 - External rewarming

Cardiac medications during hypothermic arrest management:

- Note 6:** Cardiac medications may be ineffective or harmful for patients with temperatures <86°F. Contact Medical Control prior to administering cardiac medications.
The role of vasopressors, such as epinephrine, during hypothermic resuscitation is controversial.

Other information:

- Note 7:** Good outcomes have been reported for patients with prolonged cardiopulmonary arrest associated with severe hypothermia. Longer resuscitation attempts are recommended for these patients.
Continue resuscitation attempts unless otherwise directed by Medical Control.
Rigor mortis and dependent lividity are not reliable signs of irreversible death when hypothermia precedes cardiopulmonary arrest.

Core temperature >86°F

- Note 8:** If patient's core temperature is found to be >86°F prior to or during hypothermic arrest, follow normothermic cardiac arrest protocol. (See Cardiac Section – Adult Cardiac Arrest Algorithm)

COLD INJURY / FROSTBITE

DESCRIPTION

Frostbite is the freezing of tissue that may involve only superficial tissues or extend to the bone. The onset and severity of frostbite may be affected by air temperature, wind speed, duration of exposure, amount of exposed area, and predisposing physical and environmental conditions.

Damage to frostbitten tissues is caused by crystallization of water within the tissues, typically between the cells, and by resulting changes in electrolyte concentration within the cells. Damage occurs during the freezing process. Further damage occurs during rewarming/reperfusion of frostbitten tissue.

Routine EMS Care

- ETT **Assess patient** – evaluate for hypothermia
- Place patient in warm environment**
- Expose the frostbitten part**
- Remove constricting objects** – such as jewelry or clothing
(swelling is likely to occur)
- DO NOT** attempt to rewarm if there is potential for refreezing
or if transport time to ER is <1 hour
- Contact Medical Control** for instructions if time to ER is
>1 hour (See notes below)
- DO NOT** apply additional cold or heat – do not rub affected area
- Keep ambulance warm** enough for patient comfort
- EMT-3 **Provide pain control** (See Pain Control – this section)

Notes: Multiple factors affect the decision to rewarm, including: transport time, possibility of refreezing, ability to protect rewarmed part from pressure and trauma, ability to manage severe patient pain and availability of warmed water source. Provide Medical Control information on these factors.

The ideal method of rewarming a frostbitten part is by immersion in water warmed to (and kept at) 99°F to 102°F (37° to 39°C). If water temperature cannot be precisely measured, warm it as closely as possible to normothermic body temperature.

NEAR DROWNING

DEFINITION

Near Drowning: refers to a patient who undergoes immersion with possible aspiration and is recovered without sustaining a cardiac arrest

Routine EMS Care

Asymptomatic patients require transport to the hospital because delayed respiratory compromise can follow.

Symptomatic patients should also receive the following:

ETT	<p>Provide appropriate basic life support care</p> <p>Provide oxygen per protocol</p>
EMT-2	<p>If <u>bronchospasm is present</u>, it may be treated with a trial of albuterol 2.5 mg / Atrovent 0.5 mg (3 nebulized doses may be given, if needed, prior to Medical Control contact)</p> <p>Consider CPAP (See Adult Respiratory Section – Continuous Positive Airway Pressure)</p> <p>Establish vascular access – provide NS bolus if shock is present (See Shock, IV Fluid Resuscitation Notes – this section)</p> <p>Place advanced airway if indicated</p>
EMT-3	<p>Provide continuous cardiac monitoring</p>

Near drowning patients should also be assessed for:

- Trauma
- Hypothermia
- Associated medical, toxic, and metabolic problems

In the event of cardiac arrest associated with a drowning incident, consider the following:

Notes: Drowning patients who sustain cardiac arrest are often hypothermic. If hypothermia is suspected see Hypothermic Cardiopulmonary Arrest – this section

When performing basic life support for drowning arrest patients, use ABC basic life support sequence rather than CAB sequence.

Initiate basic life support / attempt resuscitation even for prolonged submersion unless traumatic injuries incompatible with life are present (See Appendix – Determination of Death in the Field)

Dependent lividity and rigor mortis are unreliable signs of irreversible death in the hypothermic patient.

NAUSEA/VOMITING

Routine EMS Care

- ETT **Protect and maintain airway**
Monitor vital signs and **LOC**
Have suction ready – for patients who cannot protect their own airway
Provide oxygen per protocol
(blow-by or nasal cannula for nauseated patient)
- EMT-2 **Establish vascular access**
If patient has signs of shock or dehydration, give **NS bolus 250 ml** and reassess (repeat if signs of dehydration/shock continue – monitor for fluid overload)
Ondansetron (Zofran) 4 mg slow IV/O (over 2-5 minutes) or IM (may repeat one time in 10 minutes if nausea and/or vomiting persists)
- EMT-3 **Provide continuous cardiac monitoring** based on assessment – **consider 12-lead EKG**
- EMT-3A **Contact Medical Control** if nausea/vomiting is refractory to ondansetron: **Diphenhydramine 12.5-25 mg** IV/IO or IM **-or-** **Midazolam 2.5 mg** IV/IO or IN

FEVER

Routine EMS Care

- ETT **Protect and maintain airway**
Obtain history:
- Onset and duration of symptoms
 - Interventions taken
 - Assess for cause of fever
 - Other pertinent medical history
- Assess temperature** (rectal is most accurate)
Cool the patient if temperature >101° F
- Remove blankets/clothing if necessary (patient should be dressed lightly)
 - Sponge patient w/tepid water for cooling
 - Dry and cover patient if shivering starts
- Monitor temperature** during transport
- EMT-3A If fever is due to infection, and patient has not received antipyretics in the past 4 hours, assess for possible contraindications to administration of acetaminophen. (Contraindications include: inability to swallow, severe respiratory distress, surgical indications, possible liver dysfunction.)
- If no contraindications are identified, administer **acetaminophen 500 mg PO** (patient <150 lbs) or **1000 mg PO** (Patient ≥ 150 lbs)
- Contact Medical Control if clarification is needed concerning potential contraindications, dosing, and administration.

DYSTONIC REACTION

DESCRIPTION

This is an adverse reaction to a neuroleptic or antiemetic medication. It frequently involves acute onset of involuntary muscle spasm, which is painful and uncontrollable, possibly leading to respiratory compromise. Spasms of the neck muscles and the face are common presentations. Commonly, there is also difficulty with speech, swallowing, and breathing. Individuals may have ingested these medications unknowingly, especially having purchased them “on the street” or given by family “as a sleeping pill.” Clinically, dystonia can give the appearance of anxiety reactions, tetanus, strychnine toxicity, or atypical seizures. They are sometimes mistakenly reported as allergic reactions.

MANAGEMENT

Routine EMS Care

- EMT-2 **Establish vascular access** – NS TKO
Contact Medical Control for orders
- EMT-3A **Contact Medical Control** to request orders for **diphenhydramine** – the usual dose is **25 mg** slow IV (over 1 minute – possibly repeating to max 50 mg) may be given IM at the same dose
- MICP **May administer diphenhydramine 25 mg** slow IV (over 1 minute) without contacting Medical Control for patients > age 12
- Reassess patient**

OVERDOSE/POISONING

SPECIAL INFORMATION

It is essential to obtain the following information on all drug overdoses / poisonings:

- Name and ingredients of the substance(s) taken
- The amount taken
- Approximate time substance was taken or over what period of time
- Method of substance entry: ingestion, injection, inhalation or topical absorption
- Reason for the ingestion: e.g., suicide, accidental overdose, or mixture of incompatible substances
- Vomiting prior to arrival
- Interventions performed prior to EMS arrival

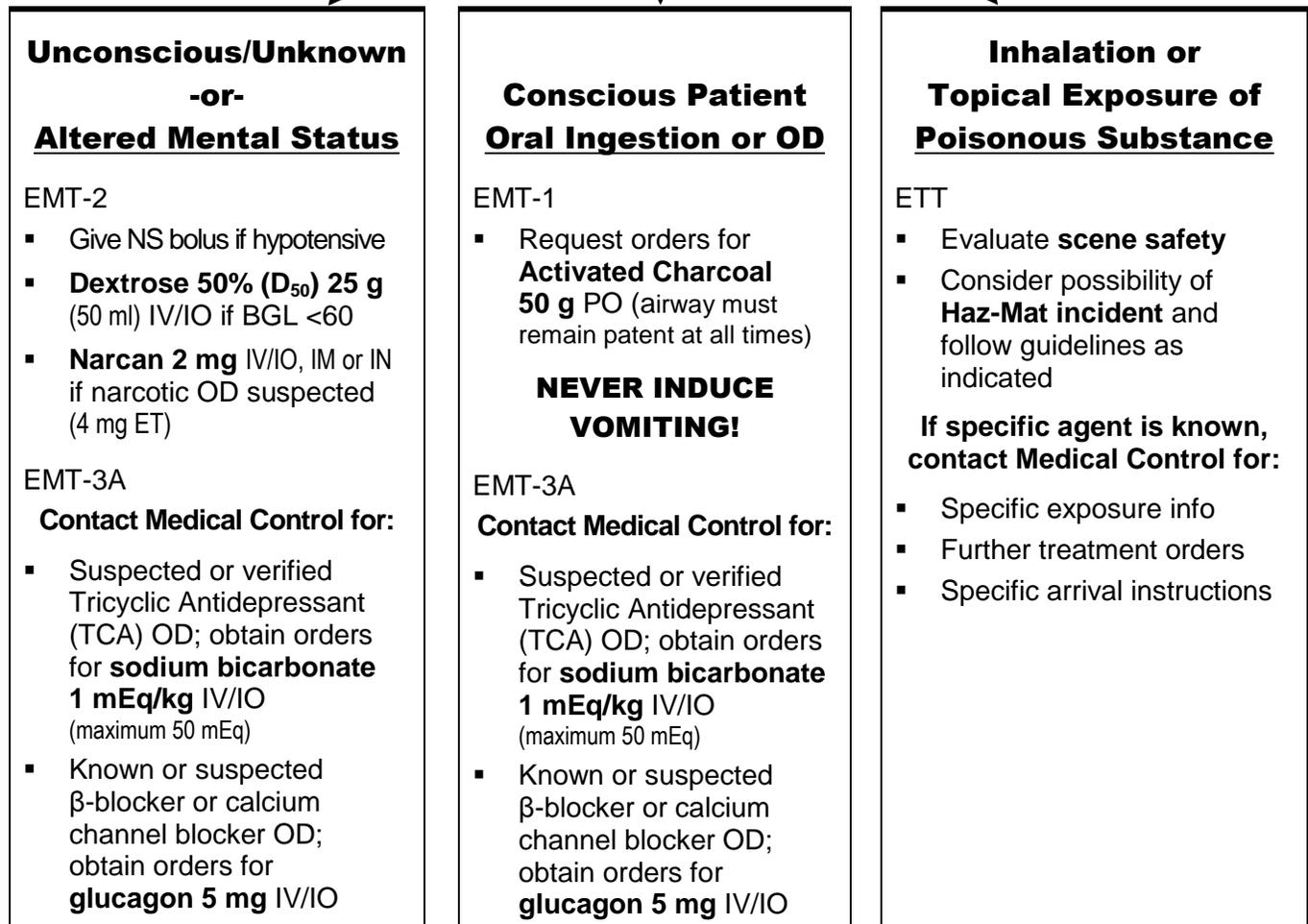
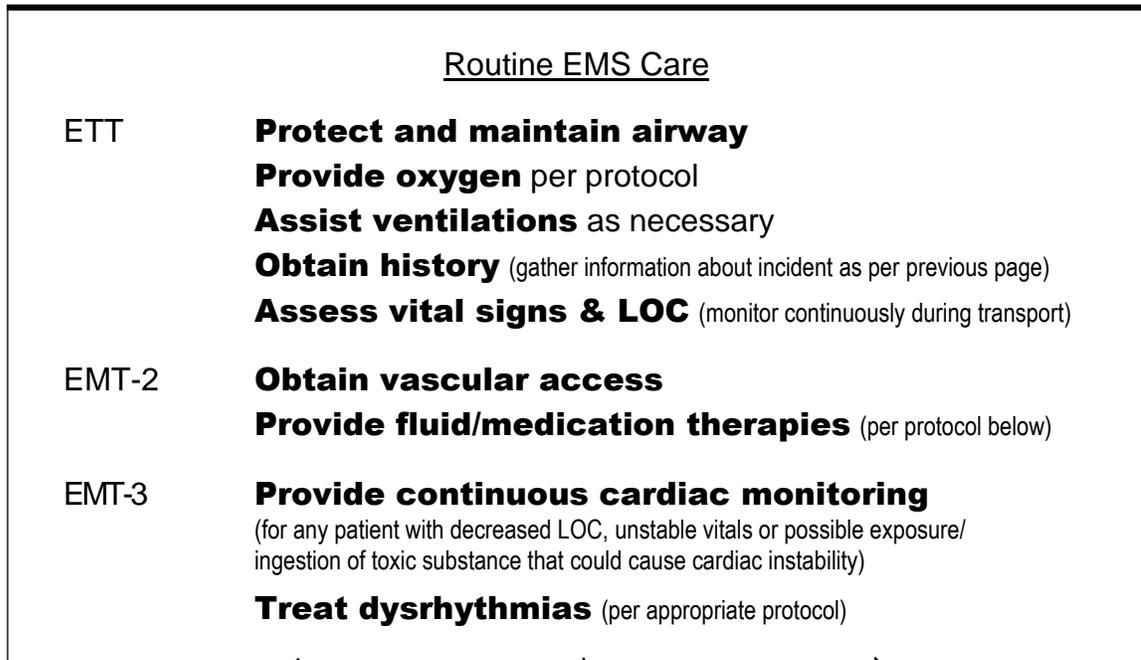
Look for container(s) of substance ingested and, if appropriate, transport with patient.

Note: Patients who intentionally overdose with intent to harm themselves are deemed NOT competent to refuse treatment/transport. Contact law enforcement personnel for assistance, if needed, for these patients.

(See Overdose/Poisoning – next page)

OVERDOSE/POISONING

At the earliest opportunity contact Medical Control



SEIZURES

DESCRIPTION

There are many causes of seizure including, but not limited to, trauma, shock, epilepsy, respiratory failure, hypoxemia, meningitis, cardiac instability, stroke, hypoglycemia, drug overdose, drug withdrawal, eclampsia, etc.

Routine EMS Care: Initiate treatment based upon history and clinical presentation. It is important to make the distinction between focal motor, general motor seizures, and status epilepticus. Not all seizures require emergent intervention.

TYPES OF SEIZURE

Grand Mal or
Generalized Motor

Seizure activity characterized by tonic/clonic movements, usually followed by a postictal state.

The components of a grand mal seizure include:

- Aura
- Loss of consciousness
- Tonic phase (extreme muscular rigidity)
- Clonic phase (rigidity and relaxation in rapid succession)
- Postictal state (altered level of consciousness)

Partial or **Focal Motor**

Seizures that usually involve unilateral motor activity, but may not cause changes in consciousness – partial seizures may progress to general or grand mal seizures

Psychomotor

Seizures that consist of personality alterations, staring, or peculiar motor activity with periods of bizarre behavior

Status Epilepticus

A potentially life-threatening condition characterized by:

10 minutes of continuous seizure activity

or

10 minutes of multiple seizures without regaining consciousness

(See Seizure Treatment protocol next page)

SEIZURES

TREATMENT

Routine EMS Care

- ETT **Consider possible causes** of seizure¹ (see appropriate protocol)
- Protect patient from injury** if still actively seizing
- Protect and maintain airway** at all times
- Provide oxygen** per protocol (blow-by, if patient is still actively seizing)
- Monitor and record vital signs** during transport
- EMT-1 **Assess BGL** (if BGL <60, See Altered Mental Status or Coma – this section)
- EMT-2 **Establish vascular access** – NS TKO
- EMT-3 If patient is actively seizing²,
- Give diazepam 5 mg** slow IV/IO (over 30 to 60 seconds)
 (repeat same dose in 2 minutes if seizure continues³)
- or-
- midazolam 2.5 mg** IN
 (repeat same dose in 2 minutes if seizure continues³)
- Contact Medical Control** for additional benzodiazepines if seizures continue³
- Provide continuous cardiac monitoring** as appropriate
- EMT-3A May administer midazolam IV/IO or IM at the same dose
- Contact Medical Control** for further direction⁴

Note 1: Assessment for possible causes can help guide management. When feasible, assessment should include: possibility of pregnancy, history of diabetes, possibility of toxic/drug-induced seizure, cardiopulmonary function or recent trauma/illness. State whether patient has a seizure history that has been previously medically evaluated.

Note 2: If patient is having a partial or focal motor seizure, contact Medical Control before treatment with benzodiazepines

Note 3: Contact Medical Control if additional diazepam or midazolam is needed to control seizure. If delay in contacting Medical Control is potentially detrimental to a critical patient, repeat doses at 5-minute intervals as needed. Contact Medical Control as soon as feasible. (Assess for and treat respiratory depression if high doses are used)

Note 4: Medical Control may order EMT-3A/MICP to give magnesium sulfate for a patient in status epilepticus refractory to benzodiazepines. Continuous cardiac monitoring is required for patients who receive magnesium sulfate, as it may cause cardiac dysrhythmias, hypotension and respiratory dysfunction. IV magnesium must be administered SLOWLY in patients with perfusing cardiac rhythms. Dosing will be guided by Medical Control. (2 g IV over 5 to 20 minutes is a typical initial dose, but alternative doses may be prescribed) If patient develops hypotension, bradycardia, heart conduction block or respiratory insufficiency, the magnesium sulfate should be discontinued. Reassess the patient, give supportive care and provide updated information to Medical Control as soon as possible.

SHOCK

Shock is best defined as inadequate tissue perfusion at the cellular level. Common manifestations are decreased LOC, peripheral vasoconstriction, decreased urine output, diaphoresis and decreased blood pressure. Shock is generally categorized as one of the following:

- Hypovolemic shock:** the result of insufficient blood or plasma in the circulatory system to maintain adequate perfusion. Common causes are blood loss, loss of serum & plasma from burns or peritonitis, and fluid loss from vomiting, diarrhea, poor oral intake, etc.
- Cardiogenic shock:** occurs when the heart fails to pump effectively, as in serious AMI
- Distributive shock:** occurs when blood vessels are peripherally dilated and will not constrict appropriately to maintain peripheral resistance and blood pressure. Common causes are sepsis and “neurogenic shock” (a type of vasodilation that occurs with spinal cord injury)
- Anaphylactic shock:** allergic reaction to external antigen (such as bee sting) or ingested antigen (such as drug, food, etc.) with features similar to distributive shock. Reaction to foreign antigen releases histamine and other vasoactive chemicals in the body, causing blood vessels to dilate and blood pressure to fall, resulting in shock.
- Obstructive shock:** decreased cardiac output due to obstruction of blood flow (i.e. tension pneumothorax, pericardial tamponade, etc.)

IV FLUID RESUSCITATION - NOTES

- Uncontrolled hemorrhage with palpable pulse:** Obtain vascular access en-route
Minimize fluid resuscitation¹
- Uncontrolled hemorrhage w/head injury** (and decreased LOC): Titrate fluids to SBP 110-120 mmHg
- Controlled hemorrhage:** (No ongoing bleeding or bleeding totally controlled by direct pressure) 20 ml/kg (up to 1 L) to begin optimizing hemodynamic status – reassess/repeat as needed (monitor for fluid overload)
- Hypovolemia without uncontrolled hemorrhage:** 20 ml/kg (up to 1 L) – reassess/repeat if shock continues
- Distributive², Anaphylactic or Obstructive shock:** 20 ml/kg (up to 1 L) – reassess/repeat if shock continues
- PEA with suspected blood loss or hypovolemia:** 20 ml/kg (up to 1 L) – reassess/repeat until ROSC
- Cardiogenic shock:** 5 ml/kg followed by reassessment – reassess & repeat if shock continues

Note 1: More aggressive fluid resuscitation is recommended in pregnant patients and pediatric patients with hemorrhagic shock (See Adult Trauma Section – Trauma During Pregnancy -or- Pediatric Trauma Section – Shock)

Note 2: EMT-2 thru MICP contact Medical control if evidence of shock continues after 40 ml/kg IV fluid has been administered and before additional boluses are given for neurogenic shock. These patients are prone to fluid overload from overzealous IV fluid resuscitation. Adequate perfusion is sometimes present before BP normalizes.

SHOCK

Routine EMS Care

ETT **ABCs – protect and maintain airway** at all times
Identify & treat obvious life threats
Provide oxygen per protocol
Assess LOC – continuously monitor VS & lung sounds
If shock is present, consider type of shock and treat per appropriate algorithm below

EMT-1 **Transport and notify receiving facility ASAP**

EMT-2 **Obtain vascular access** – NS

EMT-3 **Provide continuous cardiac monitoring**

HYPOVOLEMIC

ETT **Control bleeding/volume loss**
Consider pelvic sling / M.A.S.T. for possible pelvic instability

EMT-2 **Consider 2nd vascular access site** (See Shock, Fluid Resuscitation Notes previous page)

DISTRIBUTIVE
(Septic or Neurogenic)

ETT **Maintain spinal immobilization** for suspected neurogenic shock

EMT-2 **Give standard 20ml/kg bolus** (reassess & repeat if shock continues)
Consider 2nd vascular access site (See Adult Trauma Section – Traumatic Shock)

ANAPHYLACTIC

If shock is determined to be a result of allergic reaction or anaphylaxis, refer to Allergic Reaction / Anaphylaxis protocol (See Allergy/Anaphylaxis – this section)

CARDIOGENIC

EMT-2 **Consider cautious fluid bolus 5 ml/kg**, monitoring closely for pulmonary edema (check lung sounds, respiratory status often)

If shock continues and there is no deterioration in respiratory status, may repeat bolus

EMT-3 **Obtain 12-lead EKG**
Treat dysrhythmias per protocol
Assess for STEMI or new LBBB (See Cardiac Section – ACS Management)

Contact Medical Control as early in treatment as possible

EMT-3A Request Medical Control order for **glucagon 5 mg IV** (For patient using β-blockers or calcium channel blockers)

OBSTRUCTIVE

EMT-2 For **suspected pericardial tamponade** give standard 20 ml/kg bolus (repeat as needed)

EMT-3A For **suspected tension pneumothorax** perform needle decompression (See Appendix – Needle Chest Decompression)
Reassess and provide IV fluids if shock continues

Note: MICPs can contact Medical Control for possible epinephrine drip for refractory anaphylactic, distributive or cardiogenic shock. Epinephrine drip is not indicated for shock due to uncorrected hypovolemia or uncorrected obstructive shock.

PAIN CONTROL (Adult)

Routine EMS Care

ETT	Closely monitor vital signs and LOC
EMT-2	Establish vascular access – NS TKO
	Verify patient is hemodynamically stable – SBP >100 mmHg
EMT-3	Contact Medical Control ASAP

ACUTE TRAUMA PAIN

ETT	Align angulated fractures, splint suspected fractures, cover open wounds
EMT-3	For acute isolated extremity trauma (without contraindications such as: multiple trauma, suspected head or internal injuries, altered LOC, SBP <100, etc.)
	<p>Morphine 2-4 mg slow IV/IO (may repeat up to 10 mg) -or- Fentanyl 1-2 mcg/kg slow IV/IO or IN (may repeat to maximum 3 mcg/kg)</p>
	For other types of trauma pain, Medical Control order is required before giving narcotic analgesics. (If Medical Control contact is not possible, see Adult Trauma Section – Special Circumstances Pain Control)

BURN/FROSTBITE PAIN

EMT-3	<p>Morphine 2-4 mg slow IV/IO (may repeat up to 10 mg) -or- Fentanyl 1-2 mcg/kg slow IV/IO or IN (may repeat up to max. 3 mcg/kg)</p> <p>Contact Medical Control if:</p> <ul style="list-style-type: none"> ▪ Additional dosing is needed ▪ Contraindications to narcotics exist ▪ Requesting substitution or addition of diazepam or midazolam <p>(If Medical Control contact is not possible, see Adult Trauma Section – Special Circumstances Pain Control)</p>
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CARDIOVERSION/PACING

Conscious patients who require pacing or cardioversion should be administered sedation, if time and patient condition permit

EMT-3A	<p>Give midazolam 2.5 mg slow IV/IO or IN</p> <p>or Fentanyl 1-2 mcg/kg slow IV/IO or IN (if no contraindications are present)</p> <p>Repeat only per Medical Control</p>
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OTHER PAIN

CAUTION: This protocol requires Medical Control orders prior to giving any medication

EMT-3	<p>Assess for contraindications to medications</p> <p>Contact Medical Control and provide pain control as directed</p> <p>Orders may be given for:</p> <ul style="list-style-type: none"> ▪ morphine or Fentanyl ▪ diazepam or midazolam <p>Repeat only per Medical Control</p> <p>Monitor vital signs and LOC</p>
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Notes: When using morphine or Fentanyl, monitor respiratory status and have Narcan available
 Consider using Zofran with morphine or Fentanyl to diminish possibility of nausea/vomiting
 Contact Medical Control, when feasible, before administering narcotics for pain in children < age 12, except as described in Special Circumstances Pain Control or when needed for emergent sedation for cardioversion/pacing

EXTREME ANXIETY / COMBATIVENESS

The following options may be employed for a hemodynamically stable patient exhibiting extreme anxiety or combativeness due to psychological stress:

<u>Routine EMS Care</u>	
EMT-3	<p>Assess for & treat underlying conditions that contribute to the patient's anxiety/combativeness</p> <p>Contact Medical Control^{1,2}:</p> <p style="padding-left: 40px;">Request order for diazepam/midazolam³</p> <p style="padding-left: 40px;">Repeat as directed</p> <p>Monitor patient vital signs and LOC</p>

Many patients transported by EMS will have varying degrees of anxiety. Initial measures by EMS personnel to relieve patient anxiety include appropriate verbal interactions and professional conduct. Routine use of medications to relieve anxiety during prehospital care can be detrimental to patients by interfering with hospital assessment, and interfering with the patients' cardiopulmonary status. Medical problems that result in anxiety/combativeness should be addressed prior to administration of benzodiazepines.

For extreme refractory anxiety or combativeness in patients with stable cardiopulmonary status, EMT-3s and MICPs may contact Medical Control to discuss the administration of diazepam/midazolam in the prehospital setting.

Note 1: When contact can be established, Medical Control will guide dosing for benzodiazepines.

Note 2: EMT-3 or MICP may administer diazepam/midazolam for combativeness if needed for patient and/or crew safety prior to Medical Control authorization, if delays in contacting Medical Control are likely to result in injury. Usual initial doses are: diazepam 5 mg **or** midazolam 2.5 mg, followed by reassessment (may repeat at same dose after 5 minutes if combativeness continues – up to 3 doses), Contact Medical Control as soon as feasible and document rationale for sedation in PCR. Monitor and support cardiopulmonary status when using benzodiazepines.

Note 3: EMT-3 are authorized to use IN midazolam only, and EMT-3A can administer midazolam via IV/IO.

STROKE

Early notification of the receiving hospital is essential to ensure the immediate availability of appropriate in-hospital response

Routine EMS Care

- ETT **ABCs**
Provide oxygen per protocol (maintain SpO₂ readings ≥94%)
- EMT-1 **Obtain history** of event with focus on time of onset of symptoms
Ask question: When was patient last seen appearing and behaving normally?
Evaluate patient for signs of stroke (See Appendix – Cincinnati Prehospital Stroke Scale)
1. Assess for new unilateral arm or leg weakness
2. Assess speech – new inability to speak (also new onset of slurred or inappropriate words with clear level of consciousness)
3. Assess for new facial droop
Assess BGL – If hypoglycemic (BGL <60) treat per protocol¹
- EMT-2 **Establish vascular access** – NS titrated to maintain SBP >90 mmHg unless evidence of fluid overload is detected
If BGL <60, administer **dextrose 50% 25 g** slow IV/IO
- EMT-3 **Provide continuous cardiac monitoring** and **obtain 12-lead EKG** during transport
Transport² patient and person who witnessed event, if possible
Complete **MSB Pre-Hospital Stroke Checklist** (See Appendix)
Contact receiving hospital ASAP and provide the following:
1. Time of symptom onset
2. Description of neurological deficits (See Appendix – Cincinnati Prehospital Stroke Scale)
3. BGL

Note 1: Signs of stroke may be produced by hypoglycemia, so a low BGL must not remain untreated. However, signs may also result from lesions that require surgery. Keep patient NPO unless no other way exists to raise blood sugar. If oral route must be used, administer the most concentrated sugar preparation available.

Note 2: Expedient transport of patients who are potential candidates for reperfusion therapy is paramount. Consider the use of aeromedical transport when it would be expected to significantly decrease transport time for patients with 1.) measurable deficits on the Cincinnati Stroke Scale, and 2.) those who are potential candidates for acute reperfusion therapy. Contact Medical Control to clarify the transport decision for patients who are <8 hours from time of symptom onset upon EMS arrival.

HYPERTENSIVE CRISIS

Severe hypertension requiring pre-hospital treatment is rare. Treatment is necessary only if the hypertension clearly is causing a clinical condition to evolve or if there is documented end-organ damage due to the hypertension. The main examples of this are intracranial hemorrhage, myocardial ischemia, cardiogenic pulmonary edema and renal failure caused by elevations of blood pressure.

GUIDELINES

Treat the underlying condition associated with the elevated BP such as:

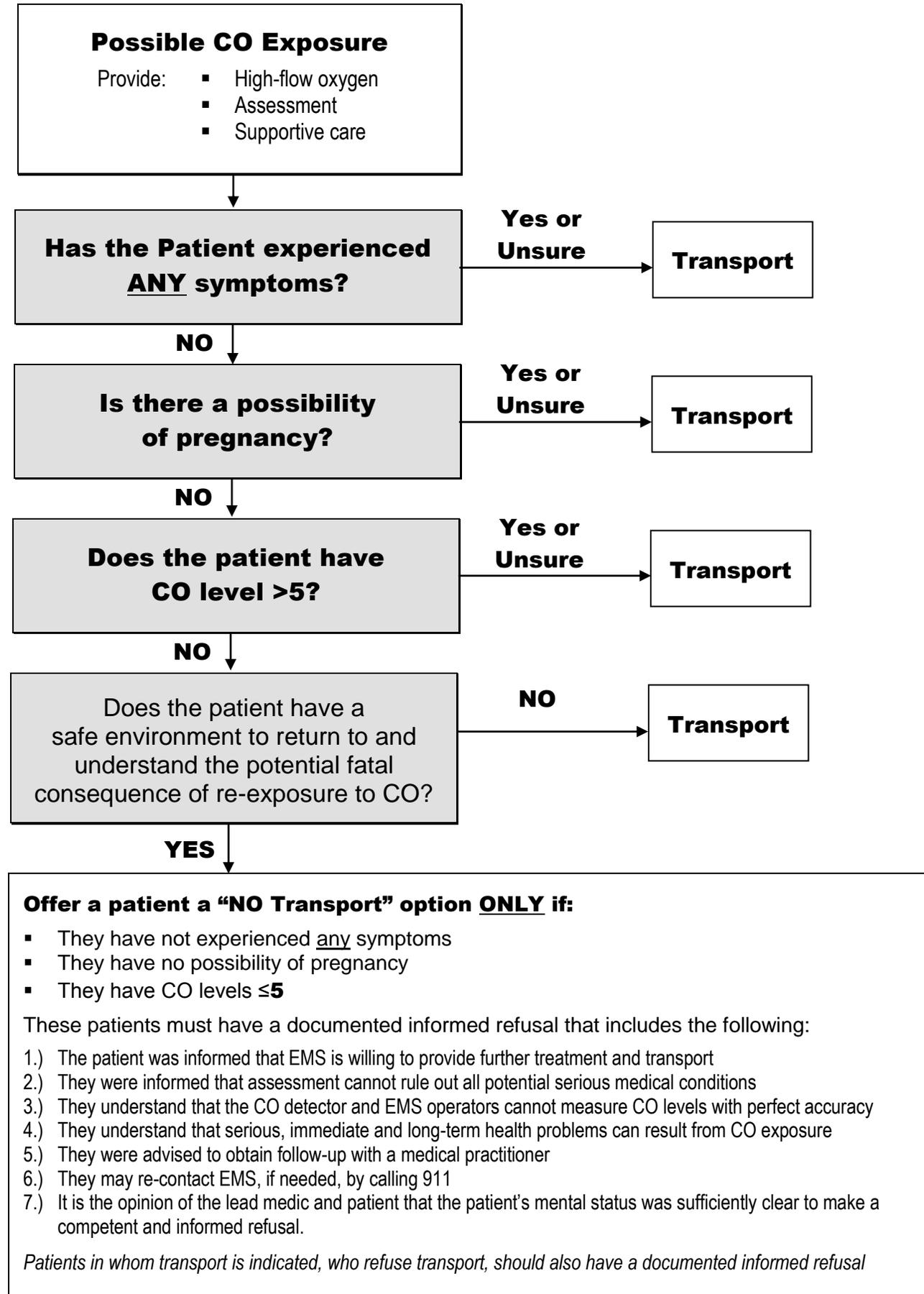
- **Acute cardiogenic pulmonary edema**
(See Adult Cardiac Section – Heart Failure / Acute Cardiogenic Pulmonary Edema))
- **Head injury** – aggressive oxygenation & trauma care
(See Adult Trauma Section – Neurological Trauma)
- **Acute coronary syndrome**
(See Adult Cardiac Section – ACS Management)

MANAGEMENT

<u>Provide Routine EMS Care</u>	
ETT	Provide oxygen per protocol Assess vital signs
EMT-1	Gather pertinent medical history
EMT-2	Establish vascular access – NS @ TKO (unless signs of shock are present)
EMT-3	Provide continuous cardiac monitoring based on assessment

Note: Attempts to lower the patient's blood pressure (other than by treating the underlying cause as described above) are potentially extremely hazardous. EMS responders are NOT to attempt such treatment without orders from Medical Control. When evaluating a patient for hypertensive emergency, assessment should focus on the patient's neurologic status and cardiopulmonary function.

CARBON MONOXIDE EXPOSURE



MAT-SU BOROUGH EMS



Section 4

ADULT TRAUMA Protocols

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MULTISYSTEM TRAUMA MANAGEMENT - ADULT

INITIAL ASSESSMENT

AIRWAY

- ETT **Provide Airway and C-Spine Control**
- Maintain in-line C-spine immobilization
 - Provide manual airway control via:
 - Head-tilt / chin lift
(spinal injury not suspected)
 - Jaw thrust
(spinal injury is suspected)
 - Suction airway as needed
- EMT-2 **Provide Advanced Airway Control** if indicated
- King Airway
- EMT-3A **Perform ET Intubation** if indicated

Note: Hypoxia is common in the trauma patient and correcting it is a high priority. Spinal injury may be present, so the airway should be managed as if C-spine instability exists. However, concern for a spinal injury **MUST NOT DELAY** adequate ventilation and oxygenation.

Maintain the neck in a neutral position. If advanced airway placement is needed, manual stabilization of the spine must be maintained throughout the insertion, so that the mandible and tongue are moved forward and the head is **NOT tilted backwards**.

BREATHING

- ETT **Provide Breathing Support**
- Assist ventilations if there is inadequate respiratory effort via:
 - Mouth-to-pocket-mask – with 100% supplemental oxygen
 - Bag-valve-mask – with 100% supplemental oxygen
 - BLS intervention for breathing-related life threats such as:
 - Flail chest – stabilize flail section
 - Open pneumothorax / sucking chest wound – 3 sided occlusive dressing
- Provide Supplemental Oxygen** to all patients with abnormal vital signs, decreased LOC, or potentially life/limb-threatening injuries
- EMT-3 **Provide Advanced Level Intervention**
- Address breathing-related life threats
- EMT-3A **Assess for tension pneumothorax** – needle decompression

CIRCULATION AND BLEEDING CONTROL

- ETT **Evaluate Pulse** (rate, strength, location) – **perform CPR** if indicated (See Cardiac – BLS algorithm)
- Evaluate Skin Condition**¹ (temperature/color/moisture) – manage for shock as indicated
- Provide Hemorrhage Control**² via:
- Direct pressure on bleeding wounds (with sterile gauze)
 - Tourniquet (indicated only if bleeding cannot be controlled by less invasive methods)
 - Note:** If tourniquet is applied, advise Medical Control **ASAP!**
 - Traction splint (may decrease life-threatening blood loss from femur fracture)
 - M.A.S.T. / Pelvic sling³ (for unstable pelvic fracture with hypotension)
- EMT-3 **Provide Continuous Cardiac Monitoring** for all patients with abnormal vital signs, decreased LOC or potentially life/limb-threatening injuries (do not delay transport for EKG monitoring)

Note 1: Pale and/or moist skin with rapid pulse is an accurate indicator of inadequate tissue perfusion / shock. Blood pressure is obtained later in the patient assessment.

Note 2: Hemorrhage control in the initial assessment is used only for massive bleeding. Minor bleeding takes a lesser priority.

Note 3: Patients with “open book” pelvic fractures may benefit from stabilization and direct pressure applied by the M.A.S.T. / pelvic sling. However, application of these devices should not delay rapid transport.

MULTISYSTEM TRAUMA MANAGEMENT - ADULT (cont'd)

INITIAL ASSESSMENT (continued)

EVALUATE LEVEL OF CONSCIOUSNESS

- ETT Assess Patient LOC via:
- Glasgow Coma Scale (see table) →
 - AVPU Scale
 - A** – Patient alert
 - V** – Patient responds to voice
 - P** – Patient responds to pain
 - U** – Patient unresponsive

Exposing the Body for Examination: It may be necessary to expose the body partially or completely to control bleeding and perform lifesaving procedures. Though it is important to consider modesty and to respect each individual's needs, do not delay assessment, treatment, and transport of the critically injured patient, for the sake of modesty.

EYE OPENING	4 – Spontaneous
	3 – To Speech
	2 – To Pain
	1 – No Response
VERBAL RESPONSE	5 – Oriented & Appropriate
	4 – Confused Conversation
	3 – Inappropriate Words
	2 – Incoherent Sounds
	1 – No Response
MOTOR RESPONSE	6 – Obeys Commands
	5 – Localizes Pain
	4 – Withdraws from Pain
	3 – Flexion Posturing
	2 – Extension Posturing
	1 – No Response

RESUSCITATION

ETT **Open and Maintain the Airway – provide oxygen per protocol** for all multi-system trauma patients

Monitor for signs of shock – obtain vital signs, and track any changes

EMT-1 Begin transport ASAP after rapid assessment and appropriate immobilization/stabilization

EMT-2 **Obtain Vascular Access:**

- Attempt to establish 2 large-bore vascular access sites
- Consider IO access if IV access not readily available (See Appendix – EZ IO)
- Use Normal Saline for fluid volume replacement

Note: Excessive time must not be spent in the field for multiple IV attempts. Initiate transport of critically injured patients ASAP! Obtain vascular access en route to the hospital

Provide Volume Replacement (See Shock / IV Fluid Resuscitation Notes – this section):

- Administer IV fluids per protocol
- For blunt trauma with decreased LOC and suspected TBI, titrate IV fluids to maintain SBP 110-120 mmHg
- For uncontrolled hemorrhage with NO suspicion of TBI, maintain IV at TKO, unless the patient deteriorates to PEA
- For trauma patients who become pulseless and show PEA, provide IV fluid boluses and search for reversible causes such as tension pneumothorax, etc.
- For hemorrhagic shock w/controllable hemorrhage, pregnant patients and pediatric patients, give IV fluids to optimize hemodynamic status
- For suspected obstructive/neurogenic shock, provide appropriate fluid therapy

EMT-3 **Initiate Continuous Cardiac Monitoring** during transport of any trauma patient who has unstable vital signs, decreased LOC or major chest injuries / internal injuries.

MULTISYSTEM TRAUMA MANAGEMENT - ADULT (cont'd)

RESUSCITATION (continued)

ETT When confronted with a multi-casualty incident that includes traumatic arrest patients:

- 1) When resources are limited, prioritize care of potentially salvageable patients that require immediate attention
- 2) When adequate resources are available, initiate resuscitation for trauma arrest patients while treating potentially reversible causes of arrest (See Adult Cardiac Section – Adult Cardiac Arrest Algorithm) such as:
 - Airway obstruction
 - Hypoxia
 - Tension pneumothorax
 - Correctable cardiac dysrhythmia
(particularly important if the dysrhythmia may have preceded the trauma)
 - Hypothermia
 - Hypovolemia
 - Hypoglycemia
 - Pericardial tamponade
 - Open pneumothorax / flail chest
- 3) With potentially salvageable patients, short scene times and rapid transport to the hospital are a priority, and should be performed concurrently with resuscitation efforts.
- 4) For trauma patients who are pulseless and apneic, and there are no identifiable reversible causes or reversible causes have been ruled out / treated, transport decisions should not jeopardize crew and public safety.

If pronouncement of death in the field is believed to be indicated, it must be authorized via contact with Medical Control, prior to discontinuation of appropriate resuscitation efforts.

If contact with Medical Control is not possible, pronouncement may be made by EMS providers per MSB EMS protocol. (See Appendices – Determination of Death in the Field)
If EMS providers are in any doubt as to the presence of a pulse or the potential for correcting the cause of arrest, initiate rapid transport concurrently with resuscitation attempts and contact Medical Control as soon as possible.

EMT-2 **Obtain vascular access** and **give fluid boluses** for suspected hypovolemia and pericardial tamponade (See Shock / IV Fluid Resuscitation Notes – this section)

Advanced airway placement and ventilation/oxygenation are appropriate methods of ruling out reversible causes of airway obstruction and hypoxia

EMT-3A Needle decompression may be employed if there is a suspicion of tension pneumothorax (See Appendix – Needle Chest Decompression)

MULTISYSTEM TRAUMA MANAGEMENT - ADULT (cont'd)

RAPID TRAUMA ASSESSMENT

ETT Evaluate the Head

Reassess airway for patency – correct any problems

Look for open wounds

- Control hemorrhage with direct pressure¹
- Apply clean dressings to all wounds

Evaluate the eyes

- Protect from further injury
- Irrigate / remove contaminants and debris
- Do not attempt to remove foreign bodies

Inspect nose and ears

- Look for fluid (blood, CSF)

Evaluate the Neck

Provide spinal immobilization² for any trauma patient who displays:

- Neck or spinal discomfort or tenderness
- Complaints of extremity numbness/tingling
- Any significant injury above the clavicle
- Multiple trauma
- Stiffness or discomfort with movement

Provide precautionary spinal immobilization based on MOI with the potential for spinal trauma if the patient exhibits:

- Reduced or impaired LOC
- Distracting injuries
- Intoxication

Inspect for neck wounds³

- Stabilize foreign bodies in place unless they compromise the airway or otherwise prevent lifesaving care
- Use direct pressure to control hemorrhage
- Avoid additional wound contamination
- Cover as feasible with sterile dressings

Note: Perform systematic trauma patient evaluations beginning at the head and proceeding to the neck, thorax, abdomen, and extremities

Do not waste time to perform unnecessary diagnostic procedures that do not produce information directly related to important pre-hospital treatment

Quickly identify critical patients who require rapid transport. Stabilize and transport these patients to an appropriate facility immediately!

NEVER secure a patient to the backboard by their head alone, as any unexpected movement could cause severe trauma/damage to the C-spine.

Do not delay transport: Most injuries to the face and head require hospital treatment. In most cases delay for any reason other than hemorrhage control and airway management is usually not appropriate.

Note 1: Lacerations of the scalp may have a fracture beneath; use only enough pressure to control hemorrhage

Note 2: Do not use the chin as a point of control when immobilizing the spine – this prevents the patient from opening their mouth; and if they vomit, aspiration is certain. Also, be aware that C-collars alone do not provide adequate immobilization. Use a C-collar in conjunction with a backboard and other head immobilization device.

Note 3: Neck wounds should not be probed. Frequently a clot forms in the carotid artery or jugular vein, which could be dislodged by probing and cause severe hemorrhage. Active bleeding can be controlled with direct pressure, taking care not to compromise the airway or intact contralateral circulation. Inspect compression dressings to ensure they do not function as unintentional tourniquets.

MULTISYSTEM TRAUMA MANAGEMENT - ADULT (cont'd)

RAPID TRAUMA ASSESSMENT (continued)

ETT Evaluate the Thorax

- Reassess ventilations – verify adequacy
- Support ventilation/oxygenation as necessary
- Re-evaluate injuries and BLS interventions
 - Chest wall injuries:
 - Simple rib fractures (no intervention needed)
 - Flail chest (stabilize flail segment / support ventilations)
 - Open pneumothorax (re-evaluate interventions)

Important!

Chest injuries can often constitute an extremely serious or critical trauma emergency

Give patients with thoracic trauma a **High Transport Priority**

Notify receiving facility **ASAP**

- EMT-2** Reassess previous interventions for:
Pericardial tamponade, hemothorax, or simple pneumothorax
- Consider advanced airway (King Airway)
 - Establish vascular access and administer fluid per protocol (See Traumatic Shock – this section)

- EMT-3** Reassess previous advanced interventions for:
Myocardial contusion
- Provide continuous cardiac monitoring
 - Treat dysrhythmias per ACLS protocols

- EMT-3A** Tension pneumothorax decompression
- Re-evaluate previous interventions

ETT Evaluate the Abdomen

- Evisceration
 - Apply moist, sterile dressing
 - Cover with occlusive dressing (such as large plastic bag or sheet)
 - Keep abdomen warm
- Foreign body / impalement
 - Stabilize foreign body to prevent further injury during transport
 - Do not remove except by direct Medical Control order
- Pelvic fracture
 - Long backboard immobilization
 - Pelvic sling or sheet wrap (appropriate to scope of practice) Consider M.A.S.T. if pelvic sling not available or appropriate.
- Abdominal hemorrhage
 - Control external bleeding with direct pressure (direct pressure will not control internal bleeding)
 - Consider M.A.S.T. application (M.A.S.T. should not delay transport)

Note: Signs and symptoms of intra-abdominal injuries are often delayed. Serial reassessment of patients with abdominal trauma is indicated. However, prolonged evaluation of the abdomen by checking for guarding, rebound tenderness or bowel sounds can result in needless delay, as well as patient discomfort.

Most patients with intra-abdominal injuries require prompt evaluation in the hospital; therefore,

Transport Without Delay

Notify Receiving Facility ASAP!

- EMT-2** Address internal hemorrhage
- Obtain vascular access but limit fluid resuscitation in patients with uncontrollable hemorrhage and palpable pulse (See Traumatic Shock – this section)

MULTISYSTEM TRAUMA MANAGEMENT - ADULT (cont'd)

RAPID TRAUMA ASSESSMENT (continued)

ETT Evaluate for Neurological Trauma – TBI, Spinal Cord or Peripheral Nerve Damage

Suspect associated C-spine injury and treat accordingly

For any patient with a reduced LOC:

- Continually reassess airway patency
- Be prepared to assist ventilations (use airway adjuncts as needed)

Provide oxygen per protocol – maintain SpO₂ ≥94%

Assist ventilations (based on respiratory rate/volume, SpO₂, etc.)

- Give 1 breath every 5-6 seconds (10-12 breaths/minute) if no indications for hyperventilation exist (carefully avoid hyperventilation except as listed below)
- Hyperventilate, giving 1 breath every 3-4 seconds (16-20 breaths/minute) if the patient exhibits both:
 - 1.) Pupillary changes (unequal pupils OR fixed, dilated pupils)
 - AND
 - 2.) GCS of 3 or 4 (with decerebrate posturing)

Evaluate/record GCS every 10 minutes or more frequently, as indicated

Evaluate pupils for:

- Size
- Equality
- Reactivity
(If GCS <13, repeat pupil evaluation every 10 minutes)

Reassess CSM function at least every 10 minutes

EMT-2 Titrate IV fluids to maintain SBP 110-120 mmHg if the patient's level of consciousness is decreased, and head injury is suspected.

If signs of shock are present, look for other causes of blood loss, as brain injury alone rarely causes hypotension.

EMT-3A If capnography is used, titrate ventilation rate to EtCO₂ of 35-40 mmHg
Note: during hyperventilation for head injury EtCO₂ target should be 30 mmHg (avoid EtCO₂ <30 mmHg)

ETT Address Impaled Objects

Weigh danger of removal against other necessary Tx and consider removal ONLY if:

- The object occludes or severely compromises the airway
- Life-threatening hemorrhage cannot be controlled with the object in place and removal would allow better hemorrhage control
- The patient has life-threatening injuries requiring rapid transport for survival, and moving the patient is impossible without removal of the impaled object

Important! Removal of impaled objects generally worsens bleeding, sometimes to the point of life-threatening hemorrhage. Tissue damage may also result during removal. It is rarely safe to remove an impaled object; instead, stabilize the object in place, so that its motion is limited during transport.

MULTISYSTEM TRAUMA MANAGEMENT - ADULT (cont'd)

RAPID TRAUMA ASSESSMENT (continued)

ETT

Evaluate Extremities

- Examine for swelling and deformity
- Assess for neurovascular function (**C**irculation, **S**ensation, **M**otor function)
- Apply direct pressure to control bleeding
- Splint as needed (re-assess neurovascular status after splinting)
- Consider M.A.S.T. for multiple leg fractures (as appropriate to scope of practice)
- Check for and remove any circumferential jewelry in region of trauma that could lead to vascular compromise (transport jewelry with patient)

FURTHER ASSESSMENT

ETT

Assess trauma patients for the possibility of associated toxic, metabolic and underlying health problems (hypoglycemia, drug ingestion, cardiac condition, etc.)

Manage per appropriate medical protocols

Note: Do not administer dextrose with BGL >60

TRANSPORTATION

ETT

It is often impossible to fully stabilize trauma patients in the pre-hospital setting

Balance lifesaving interventions (such as airway management and spinal immobilization) with minimizing scene time (less than 10 minutes) and rapid transport to reduce the time from injury to definitive surgical treatment.

Early notification of the receiving hospital is essential to ensure the immediate availability of appropriate in-hospital response

NEUROLOGICAL TRAUMA

Neurological trauma includes head injury (Traumatic Brain Injury – TBI) C-spine or spinal cord injury, and peripheral nerve trauma.

Routine EMS Care

ETT	<p>Suspect C-spine injury and treat accordingly for any trauma patient with reduced LOC</p> <p>Continually protect and maintain airway</p> <p>Prepare for BVM-assisted ventilations¹ – use OPA/NPA as needed²</p> <p>Provide oxygen per protocol – maintain target SpO₂ ≥94%</p> <p>Evaluate/record GCS every 10 minutes or more frequently, as indicated</p> <p>Evaluate pupils (for patients with decreased LOC and suspected TBI) at least every 10 minutes for:</p> <ul style="list-style-type: none"> • Size • Equality • Reactivity <p>Assess CSM (circulation/sensory/motor) function at least every 10 minutes</p>
EMT-1	<p>Assess BGL³ (for patient with reduced LOC)</p>
EMT-2	<p>Establish vascular access⁴</p> <p>Titrate IV fluids to SBP 110-120 mmHg (for patient with suspected traumatic brain injury and uncontrolled hemorrhage – for isolated traumatic brain injury without uncontrolled hemorrhage, higher BP is acceptable)</p> <p>Administer IV/IO dextrose per protocol (for patient with reduced LOC and hypoglycemia.³ See Adult Medical Section – Altered Mental Status or Coma)</p>
EMT-3A	<p><u>If capnography is used</u>, titrate ventilation rate to EtCO₂ of 35-40 mmHg</p> <p>Note: during hyperventilation for head injury EtCO₂ target should be 30 mmHg (avoid EtCO₂ <30 mmHg)</p>

Note 1: Give 1 breath every 5-6 seconds (10-12 breaths/minute) unless indications for hyperventilation exist. Carefully avoid hyperventilation except as listed below:

Hyperventilate at 1 breath every 3-4 seconds (16-20 breaths/minute) if the patient exhibits both:

- Pupillary changes (unequal pupils OR fixed, dilated pupils) AND
- GCS of 3 or 4 (no response to pain OR decerebrate posturing)

Note 2: Nasopharyngeal airways are relatively contraindicated in facial trauma patients. An oropharyngeal airway may be a safer alternative if a possible basilar skull fracture exists. Nasopharyngeal airways for these patients should only be used if they are essential for avoiding hypoxemia.

Note 3: Hypoglycemia has been shown to worsen traumatic brain injury – maintain BGL ≥60

Note 4: If signs of shock are present, look for other causes of blood loss, as brain injury alone rarely causes hypotension.

SPINAL CORD INJURY / SPINAL IMMOBILIZATION

Conscious patients who present with: paralysis, numbness or tingling of extremities, spinal pain or tenderness or other neurological deficits due to trauma, require immediate spinal immobilization and treatment as outlined below.

In the absence of the above signs and symptoms, immobilize and treat for potential spinal injury when mechanism of injury suggests possibility of spinal injury, and the patient has: reduced LOC, signs of altered mental status, questionable competence, distracting injury or signs of intoxication (alcohol or other drug effects). Mechanisms of injury suggestive of spinal injury include:

- **Falls** from greater than patient's height
- **Motor vehicle accident**
- **Bicycle or pedestrian vs vehicle accidents**
- **Assault** or other **significant blow to the head**
- **Diving** or **boating accidents**
- **Other trauma** in which significant stress to the neck/spine is suspected

For patients whose age, chronic medical condition or other factors could interfere with communication and perception of pain, consider spinal immobilization even with less clear signs and symptoms, and lesser mechanism of injury. When in doubt choose immobilization.

Routine EMS Care

ETT	<p>Protect and maintain airway Provide oxygen per protocol – support ventilations as needed Maintain manual C-spine stabilization – apply C-collar Palpate and inspect spinal column Assess circulation, sensation, motor function – in all extremities Immobilize patient – with a long backboard or KED (padding between board and patient is highly recommended whenever possible) Re-assess CSM function in all extremities Assess and monitor vital signs</p>
EMT-1	Transport without delay
EMT-2	Obtain vascular access if patient has altered LOC, internal hemorrhage is suspected or vital signs are unstable (See Shock – this section)
EMT-3	<p>Contact Medical Control for orders – if pain control is required Continually re-assess patient for changes during transport</p>

Notes: When moving the patient, the spinal column **MUST** be maintained in a neutral, in-line position at all times. EMS responders must coordinate all movements to accomplish this.

For significant mechanisms of injury, always immobilize the neck and spine OR provide clear documentation in the PCR that the patient met all criteria specified in the Selective Spinal Immobilization protocol (See protocol next page).

If immobilization is indicated, but the patient refuses to allow it, proceed as recommended by the Refusal of Care Protocol (See Appendix – Refusal of Care During Transport). Include documentation of the refusal in the PCR.

SELECTIVE SPINAL IMMOBILIZATION

Spinal injury must initially be assumed for ALL patients with a high-risk mechanism of injury

If there is no pain or tenderness in the area of the neck or spine, AND there are no sensory or motor deficits (including paralysis, motor weakness, tingling or burning in extremities) then the EMT-2 may elect to defer immobilization of the spine IF the patient meets all of the following criteria:

AWAKE: The patient must be fully conscious, with a GCS of 15

ALERT: The patient must be well oriented and able to answer questions appropriately

CALM¹: The patient must be sufficiently calm to cooperate in the assessment, and must have no other injuries painful enough to distract them from the pain of a spinal injury

SOBER: The patient must have no recent use of alcohol or other drugs that may blunt or alter pain perception

IF IN DOUBT, IMMOBILIZE THE SPINE!

Procedure for Selective Spinal Immobilization

EMT-2 Verify the patient is fully "awake, alert, calm, and sober" as stated in the criteria above.

 Confirm the patient has no pain or tenderness along the neck or spine, no sensory or motor deficits, and no painful distracting injuries.

 Ask the patient to CAREFULLY rotate, flex, and extend the neck.

 Give clear instructions to stop IMMEDIATELY upon feeling ANY pain or stiffness; **NEVER FORCE THE PATIENT'S NECK.**

 If the patient can fully rotate, flex and extend the neck without pain or stiffness, spinal immobilization may be deferred.

 If pain or stiffness is reported, stop movement immediately, immobilize the neck, and employ full spinal precautions.

Note 1: If a patient is distraught, there are communication barriers or if the patient is unable to cooperate with a thorough evaluation, spinal immobilization should be performed.

Notes: For significant mechanisms of injury, always immobilize the spine OR provide clear documentation in the PCR that the patient meets all criteria for deferring spinal immobilization. If in doubt, immobilize the spine.

The patient should be informed that prehospital selective spinal immobilization does not definitively rule out all significant spinal injuries, and further evaluation at the hospital and transport are recommended. This Selective Spinal Immobilization Protocol is designed to identify individuals that do not require spinal immobilization during an ambulance transport. Patients electing not to be transported cannot be assured that significant injuries to the spine have been ruled out.

Selective spinal immobilization for pediatric patients is often complicated by their age. If the patient's age or chronic medical condition could interfere with communication or perception of pain, consider spinal immobilization even with less clear signs and symptoms, and lesser mechanism of injury. When in doubt choose immobilization.

DIVING ACCIDENTS (Including Barotrauma and Decompression Injuries)

Diving accidents include trauma, barotrauma, and decompression injuries.

Barotrauma is injury that results from a diver's tissue being squeezed by overlying water pressure. This can develop during descent or ascent, and often involves injuries to body cavities that contain air (i.e. lungs, GI tract, middle/inner ear, sinuses, etc.).

Decompression injuries occur during or after ascent. As the body is exposed to decreasing pressure, air bubbles (mostly nitrogen) form in the tissues and bloodstream. These bubbles cause inflammatory reactions, interfere with perfusion, and often present with: stroke-like symptoms, pain, dizziness, difficulty breathing, etc.

Symptoms of barotrauma and decompression injury include:

- | | | |
|---------------------|----------------------------------|------------------------------|
| ▪ <i>Dyspnea</i> | ▪ <i>Stroke-like symptoms</i> | ▪ <i>Slurred speech</i> |
| ▪ <i>Paralysis</i> | ▪ <i>Decreased consciousness</i> | ▪ <i>Numbness</i> |
| ▪ <i>Joint pain</i> | ▪ <i>Unusual weakness</i> | ▪ <i>Visual disturbances</i> |
| ▪ <i>Dizziness</i> | ▪ <i>Seizure</i> | |

Routine EMS Care

- | | |
|-------|--|
| ETT | <p>Protect and maintain airway</p> <p>Consider possible spinal injuries – manage appropriately</p> <p>Provide oxygen – at the highest concentration possible</p> <p>Place patient in supine position¹</p> <p>Transport to ER for evaluation</p> <p>Assess for associated trauma and medical conditions – treat per protocol</p> <p>Protect from excessive heat or cold</p> <p><u>PROVIDE EARLY NOTIFICATION TO RECEIVING FACILITY²</u></p> <p>Monitor vital signs and LOC during transport</p> <p>Save diving equipment for investigation</p> |
| EMT-2 | <p>Establish vascular access – provide vigorous fluid resuscitation
20 ml/kg bolus (over 10 minutes) then 500 ml/hr (unless signs of fluid overload develop³)</p> <p>Contact Medical Control – for IV fluid therapy modification during prolonged transports</p> |
| EMT-3 | <p>Provide continuous cardiac monitoring</p> |

Note 1: A lateral recumbent position may be used for a patient with nausea and vomiting, to prevent aspiration. Maintain spinal alignment if spinal injury is suspected. Consider Zofran for nausea and vomiting. (See Medical Section – Nausea/Vomiting)

Note 2: Diversion to a hyperbaric facility may be ordered by Medical Control, but may only be feasible with the earliest possible notification

Note 3: The patient with decompression injury will theoretically benefit more from IV fluid resuscitation than a patient with barotrauma or traumatic injury. However, because the initial presentation of these three types of diving incidents can be so similar, vigorous IV fluid resuscitation is initially recommended for all diving injuries where decompression injury is possible.

EXTREMITY TRAUMA

<u>Simple Fractures:</u>	Splint in a neutral position. Use gentle traction to move an angulated limb into a neutral position on the splint. This increases patient comfort and circulation in the limb.
<u>Open Fractures:</u>	Gently straighten and splint open fractures that do not involve a joint. If fractured bone ends are drawn back into the wound, be sure to advise the receiving facility. If gross contamination of the wound or bone ends is present, consider careful irrigation with normal saline prior to straightening. If bone ends are left exposed, cover with a moist dressing. Keep moist during transport.
<u>Fractures with Joint Involvement:</u>	When a joint is involved in the injury, splint in the position found. However, if circulation is absent distal to the injury, make one attempt to reposition and restore circulation before splinting. Contact Medical Control.

ETT	<p>Control hemorrhage – using direct pressure (consider tourniquet¹ for life-threatening hemorrhage that cannot be controlled with direct pressure – contact Medical Control ASAP)</p> <p>Splint and immobilize injured extremity – continually monitor CSM distal to the injury</p> <p>Provide oxygen per protocol – if signs of shock, hypoxia or dyspnea develop</p> <p>Remove circumferential jewelry in regions of trauma that could lead to vascular compromise (transport jewelry with patient unless alternate directions are given by the patient)</p> <p>Consider elevation of extremity and application of cold packs</p> <p>Continually re-assess for coexisting trauma, toxicity or metabolic problems</p>
EMT-2	Obtain vascular access if signs of shock are present, pain medications are required or internal injuries are suspected (See Shock / Fluid Resuscitation Notes – this section)
EMT-3	Provide pain control as needed (See Pain Control – this section)

AMPUTATION

ETT	<p>Control bleeding as needed, using direct pressure (consider tourniquet¹ for life-threatening hemorrhage that cannot be controlled with direct pressure – contact Medical Control ASAP)</p> <p>Cover wound to prevent further contamination</p> <p>Locate the amputated part – whenever possible</p> <p>Wrap amputated part – in a moist, sterile, dressing and seal it in a plastic bag</p> <p>Place the bag in a cool solution or on top of a folded cloth placed on ice or snow (NEVER immerse the amputated part or place it directly on ice – the amputated part should be “cool but not frozen, moist but not drowned”)</p> <p>Transport the amputated part with the patient</p>
EMT-2	Monitor for signs of shock – if bleeding is severe or life threats exist, prioritize patient transport over care/transport of the amputated part (See Shock – this section)
EMT-3	Provide pain control as needed (See Pain Control – this section)

Note 1: The use of a tourniquet can result in loss of limb. Use only for life-threatening hemorrhage not controlled by other means.

Notes: If it is certain that hypovolemia is the result of external hemorrhage only, that bleeding can be controlled with direct pressure, and that no possibility of internal hemorrhage exists, then titrate IV fluid to obtain an optimal hemodynamic status (See Shock / Fluid Resuscitation Notes – this section)

If extremity hemorrhage is uncontrollable with direct pressure, or there is a possibility of uncontrolled internal hemorrhage, fluid resuscitation should be minimized. If associated serious head injury (with decreased LOC) is suspected, then titrate IV fluids to SBP 110-120 mmHg per protocol (See Shock / Fluid Resuscitation notes – this section)

EYE TRAUMA

Routine EMS Care

ETT

Foreign Body in Eye:
(Penetrating)

DO NOT REMOVE OBJECT

Stabilize eye by most effective means available
(e.g. paper cup over object, bulky dressing, etc.)

Patch other eye to reduce eye movement

Transport patient supine to prevent further eye
fluid loss

Foreign Body in Eye:
(Non-penetrating)

Flush affected eye(s) w/sterile normal saline

Blunt Trauma to Eye:
(Without Penetration)

Cover both eyes lightly

Transport patient with head elevated unless
contraindicated by presence of other condition

Caustic Substance to Eye:

Immediately flush eyes and surrounding areas
with copious amounts of normal saline for **at least
20 minutes**. Clean water is acceptable if available
supplies of saline are not adequate for flushing

If possible, continue irrigation during transport
and contact Medical Control before discontinuing

Avoid washing substance into unaffected eye or
back into the affected eye or into ears

Irrigate well under the eyelids

Remove contact lenses if present

BURN INJURIES

DESCRIPTION

For prognostic and management reasons, burns are classified in several different ways.

- A. Mechanism of burn:
- 1) Thermal
 - 2) Chemical
 - 3) Electrical
 - 4) Inhalation
- B. Depth of burn wound:
- 1) Superficial (1st degree) affecting only superficial layers of the skin, with redness & pain
 - 2) Partial thickness (2nd degree) penetrating deeper layers of the skin producing pain, blistering and edema
 - 3) Full thickness (3rd degree) involving all skin layers, also possibly involving underlying muscle, bone, and/or other structures. Lack of pain is characteristic
- C. Extent of burn wound: expressed as % of TBSA (total body surface area) calculated by:
- 1) Rule of nines (See Appendices – Rule of Nines)
 - 2) Rule of palms (palmar surface of patient's hand = approximately 1% TBSA)
- D. Location of burn wound: Burns of the face, neck, hands, feet, perineum or genitalia, as well as any circumferential burns, carry a higher risk of morbidity than burns of similar size in other locations. Facial burns are often accompanied by upper airway edema; be prepared to intubate these patients.

For any patient with suspected carbon monoxide exposure or inhalation injury (particularly patients with singed nasal hairs or carbonaceous sputum, or those burned by fires in closed spaces), begin oxygen at the highest possible flow rate. When carbon monoxide exposure is suspected in a patient who is, or may be pregnant, 100% oxygen is indicated to protect the fetus, even if the patient has low levels, or no detectable blood CO levels, in the prehospital setting.

BURN PATIENTS ARE OFTEN VICTIMS OF MULTIPLE TRAUMA

TREATMENT OF ALL MAJOR TRAUMATIC INJURIES TAKES PRECEDENCE
OVER BURN WOUND MANAGEMENT

BURN PATIENTS SHOULD ALSO BE EVALUATED FOR COEXISTING TRAUMA, TOXICITY OR
METABOLIC PROBLEMS AND TREATED PER PROTOCOL

AT ALL TIMES PROTECT YOURSELF FROM EXPOSURE!

ENSURE STATE OF ALASKA BURN REPORTING FORMS ARE COMPLETED FOR ALL
PATIENTS THAT MEET MANDATORY REPORTING REQUIREMENTS

THERMAL BURNS

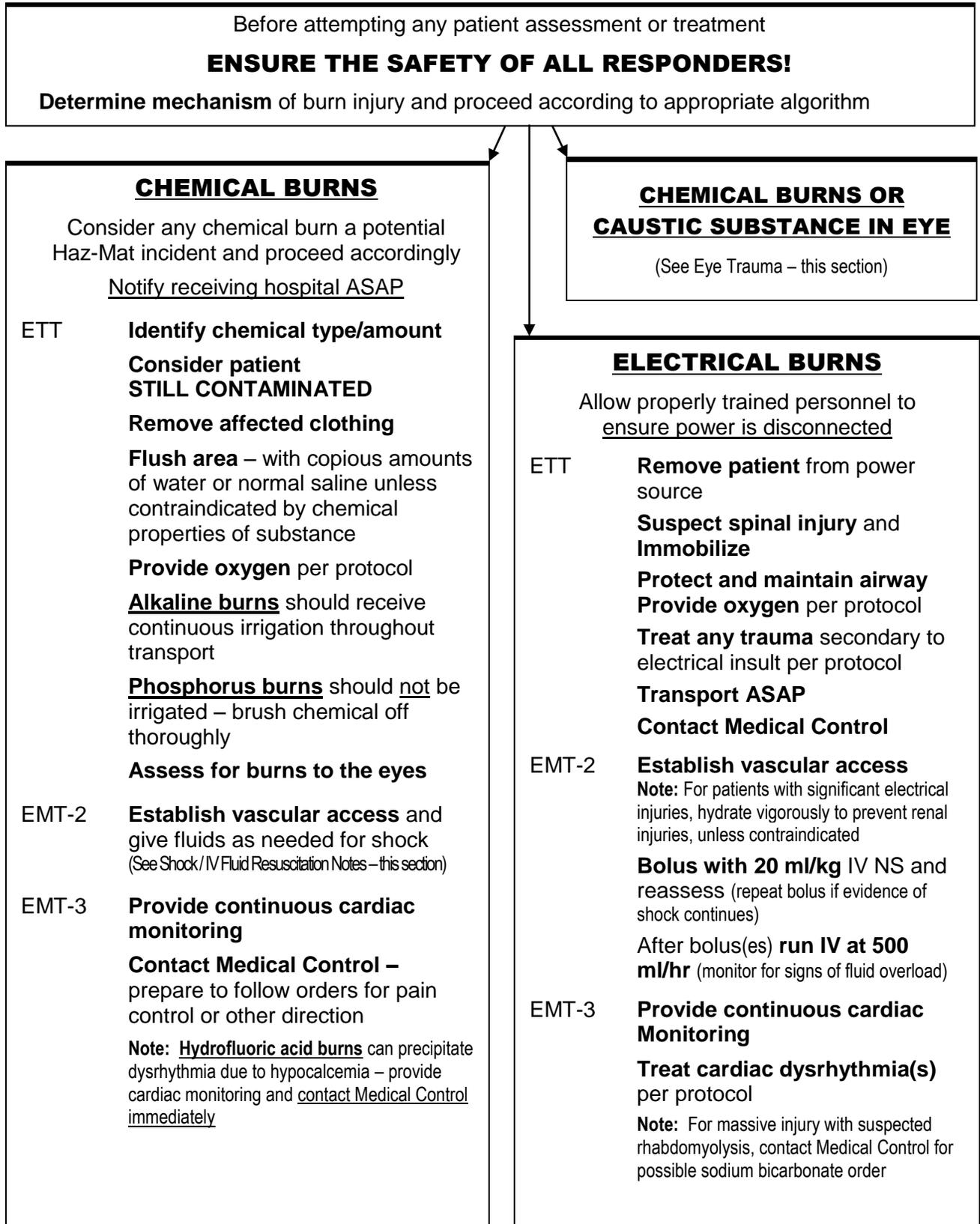
Evaluate the causative agent before initiating treatment. Stop the burning process by removing the patient from the source of exposure or eliminate the source as per guidelines noted below. Evaluate the depth of the burn wound, and estimate the TBSA of the burn injury.

Routine EMS Care

- ETT **STOP THE BURNING PROCESS!**
Put the fire out – return the skin temperature to near normal
If skin is still hot – apply water or NS for up to 2 minutes (if TBSA is <10%)
Remove smoldering, non-adherent clothing and jewelry
Be careful – do not pull off skin or tissue – do not intentionally break blisters
Do not apply ointments, creams, or antibiotics
Transport ASAP to appropriate facility
Consider air transport for critical patients
Protect and maintain airway
Provide oxygen per protocol
Suspect upper airway burn - check for and document the presence of:
singled facial or nasal hair, hoarseness, wheezing, cough or stridor
Assess the patient – for coexisting traumatic and toxic/metabolic problems
Remove – any circumferential jewelry that could cause vascular compromise
(transport jewelry with the patient)
Estimate TBSA burned
Cover burns – with clean, dry dressing
- EMT-2 **Establish vascular access** – if burn TBSA $\geq 9\%$, or otherwise indicated
(in area not affected by burn if possible)
If burn injury >18% TBSA – begin fluid resuscitation at **500 ml/hr**
(monitor for signs of fluid overload)
If patient shows evidence of shock – administer **20 ml/kg NS bolus**
(reassess patient – if shock continues, repeat NS bolus)
- EMT-3 **Provide continuous cardiac monitoring** – for burns >18% TBSA, or if
patient displays: decreased LOC, signs of shock, or abnormal vital signs
Provide pain control – if no contraindications are present:
 morphine sulfate 2-4 mg slow IV/IO (repeat if needed in 10-15 minutes to max of 10 mg)
 -or-
 Fentanyl 1-2 mcg/kg slow IV/IO or IN (repeat if needed once in 10 min to max 3 mcg/kg)
Contact Medical Control – if additional narcotics are needed, or to request
substitution/addition of benzodiazepines:
 diazepam 5-10 mg slow IV/IO (or dosing guided by Medical Control)
 -or-
 midazolam 2.5 mg slow IV/IO or IN (or dosing guided by Medical Control)
Be prepared to place advanced airway if patient deteriorates
(ET intubation is the airway of choice for possible airway burns)

CHEMICAL/ELECTRICAL BURNS

Evaluate the causative agent before initiating treatment. Stop the burning process by removing the patient from the source of exposure or eliminating the source as per guidelines below. Evaluate the depth of the burn wound, and estimate the TBSA of the burn injury.



SHOCK

IV FLUID RESUSCITATION - NOTES

Uncontrolled hemorrhage with palpable pulse:

Obtain vascular access en-route
Minimize fluid resuscitation¹

Uncontrolled hemorrhage w/head injury (and decreased LOC)

Titrate fluids to SBP 110-120 mmHg

Controlled hemorrhage:
(no ongoing bleeding or bleeding totally controlled by direct pressure)

20 ml/kg (up to 1 L) to begin optimizing hemodynamic status – reassess/repeat as needed (monitor for fluid overload)

Neurogenic shock:
(associated with spinal cord injury and often accompanied with bradycardia)

20 ml/kg (up to 1 L) – reassess/repeat if shock continues

Obstructive shock:
(due to pericardial tamponade and/or tension pneumothorax)

20 ml/kg (up to 1 L) – reassess/repeat if shock continues

PEA with suspected blood loss or hypovolemia:

20 ml/kg (up to 1 L) – reassess/repeat until ROSC

Note 1: More aggressive fluid resuscitation is recommended in pregnant patients and pediatric patients with hemorrhagic shock (See Adult Trauma Section – Trauma During Pregnancy -or- Pediatric Trauma Section – Shock), and in patients with traumatic brain injury without evidence of uncontrolled hemorrhage.

TRAUMATIC SHOCK

TREATMENT

Routine EMS Care

ETT **Assess ABCs**
Protect & maintain airway – support ventilations¹
Address obvious life threats
Provide oxygen per protocol
Assess LOC – continuously monitor vitals & lung sounds

EMT-1 **Transport / notify receiving facility ASAP**

EMT-2 **Establish vascular access** – provide NS bolus per protocol

EMT-3 **Provide continuous cardiac monitoring**

HYPOVOLEMIC SHOCK¹

ETT **Provide bleeding control**
to minimize volume loss
Consider pelvic sling / M.A.S.T.
for possible pelvic instability

EMT-2 Consider **2nd large-bore
vascular access site**
Give fluids per protocol and
according to hemorrhage type
(uncontrolled, controlled, with head injury
or patient in PEA – see notes previous page)

NEUROGENIC SHOCK¹

ETT **Spinal immobilization**
(required for suspected neurogenic shock)

EMT-2 Give **standard fluid bolus**
(reassess & repeat² if shock continues)
Consider **2nd vascular
access site**

EMT-3 **Contact Medical Control**
(for possible use of atropine if refractory
shock and bradycardia are present)

OBSTRUCTIVE SHOCK¹

EMT-2 For **suspected pericardial
Tamponade** – give standard
bolus (repeat as needed)

EMT-3A For **suspected tension
Pneumothorax** – perform
decompression (See Appendix –
Needle Chest Decompression)

Note 1: Traumatic shock can have multiple simultaneous causes.

Note 2: EMT-2 thru MICP contact Medical Control if evidence of shock continues after 40 ml/kg IV fluid has been administered, and before additional boluses are given.

Neurogenic shock patients are prone to fluid overload from overzealous IV fluid resuscitation.

Adequate perfusion is sometimes present before normalizing of blood pressure.

TRAUMATIC PAIN CONTROL (Adult)

Routine EMS Care

- ETT **Closely monitor vital signs** and **LOC**
- EMT-2 **Establish vascular access** – NS TKO
- Verify hemodynamic stability** – SBP \geq 100 mmHg
- EMT-3 **Contact Medical Control ASAP**

ACUTE TRAUMA PAIN

- ETT Align angulated fractures, splint suspected fractures, cover open wounds
- EMT-3 For **acute isolated extremity trauma** (without contraindications such as: multiple trauma, suspected head or internal injuries, altered LOC, SBP <100)
- morphine 2-4 mg** slow IV/IO
(may repeat in 10-15 minutes to maximum of 10 mg)
- or
- Fentanyl 1-2 mcg/kg** (may repeat once in 10 minutes to max 3 mcg/kg)
- For other types of trauma pain, a Medical Control order is required before giving narcotic analgesics (if Medical Control contact is not possible, see Special Circumstances Pain Protocol – next page)

BURN/FROSTBITE PAIN

- EMT-3 **morphine 2-4 mg** slow IV/IO
(may repeat in 10-15 minutes to max 10 mg)
- or
- Fentanyl 1-2 mcg/kg** (may repeat once in 10 minutes to maximum 3 mcg/kg)
- Contact Medical Control if:**
- Additional dosing is needed
 - Contraindications to narcotics exist
 - Requesting substitution or addition of diazepam or midazolam
- (If Medical Control contact is not possible, see Special Circumstances Pain Control – next page)

OTHER TRAUMA PAIN

If pain is not from burn/frostbite or acute isolated extremity trauma or if potential contraindications for morphine/Fentanyl exist, contact Medical Control prior to administration of pain control medications.

- EMT-3 Assess for contraindications to medications
- Contact Medical Control** and request pain control / dosing orders
- Orders may be given for:
morphine or **Fentanyl**
diazepam or **midazolam**
- Repeat as directed by Medical Control
- Closely monitor vital signs & LOC

Notes: When administering morphine or Fentanyl, monitor respiratory status and have Narcan available.

Consider giving Zofran with morphine or Fentanyl to diminish possibility of nausea or vomiting.

Contact Medical Control, when feasible, before administering narcotics for pain in children < age 12, except as described in Special Circumstances Pain Control or when needed for emergent sedation for cardioversion/pacing.

SPECIAL CIRCUMSTANCES PAIN CONTROL (EMT-3 & MICP)

The pain control protocol on the preceding page is to be followed whenever possible. However, when contact with Medical Control is not feasible, EMT-3s and MICPs may administer IV or IN Fentanyl to patients \geq age 6, with acute trauma or burn/frostbite pain if **all five of the following criteria** are met:

- The patient's condition warrants **immediate administration of pain medication:**
 - The patient must have no history of Fentanyl allergy
 - The PCR must document this information, and the fact that no contact with Medical Control could be established
- The patient must have a **clear level of consciousness:**
 - GCS must be ≥ 14
 - GCS must be recorded in the PCR before, and 10-15 min after each dose of Fentanyl
- The patient must show **no evidence of respiratory failure or shock:**
 - SBP must be ≥ 100 mmHg (or age-appropriate for pediatric patient)
 - SBP must be recorded in the PCR immediately before, and 10-15 minutes after each dose of Fentanyl
- The patient must be **at least 6 years old** with **acute trauma or burn/frostbite pain**
- **Narcan must be immediately available** should narcotic reversal become necessary:
 - Monitor the patient closely for respiratory depression

If unable to contact Medical Control:

- Slowly administer **Fentanyl** (titrated to control pain) **1-2 mcg/kg** (may repeat after 15 minutes as stated below)
- After each dose of Fentanyl, **re-evaluate** the patient
- **Document** the use of Fentanyl in the PCR, including:
 - Mental status
 - Hemodynamic status (including blood pressure)
 - Respiratory status
 - Evidence of undesirable side effects or allergy
 - Effect on pain level
- After each dose, reattempt contact with the receiving physician

If contact is still not possible:

- Administer additional **Fentanyl** in **0.5-1 mcg/kg** doses every 15 minutes
- **Document** in the PCR that Medical Control cannot be contacted and the patient continues to have all of the following before each additional dose is administered:
 - Intact mental status (GCS 14 or above)
 - No signs of respiratory failure or shock (SBP ≥ 100 mmHg or age-appropriate for pediatric patient)
 - No evidence of adverse reactions or allergic reactions
 - Inadequate pain control

Report to Medical Control, as soon as contact is possible, regarding the patient's condition and the amount of Fentanyl administered.

Note: Consider giving Zofran with Fentanyl to reduce possibility of nausea/vomiting.

TRAUMA DURING PREGNANCY

The most common cause of fetal death following traumatic injury is maternal death. The best way to assure the safety of the fetus is to provide supportive care to the mother.

When caring for a pregnant victim of trauma:

- **Rapidly assess fetal viability and report to receiving facility:**
 - Is uterus (fundus) above the umbilicus or,
 - Is gestational age >18 weeks (which suggests a potentially viable fetus)

Note: Fetus may be in jeopardy while mother's vital signs appear stable
- **Treat patient per Adult Trauma Protocols**, with the following additional considerations:

Routine EMS Care

ETT	Provide oxygen per protocol Check externally for uterine contractions Check externally for vaginal bleeding / amniotic fluid leak Do not perform an internal vaginal exam Note: Avoid positioning a patient in her second or third trimester of pregnancy in a supine position, as hypotension may result. If spinal immobilization is required, tilt the backboard to the left to prevent pressure of the uterus on the inferior vena cava.
EMT-2	Establish vascular access (In 2 nd & 3 rd trimester patients, place IV above the diaphragm, if at all possible) Treat shock aggressively via NS bolus Re-assess for shock and repeat bolus as needed Immediately begin rapid transport Contact Medical Control

Note: Pregnant patients with even seemingly minor abdominal trauma should be transported for evaluation in order to assess for the following:

- Feto-maternal hemorrhage, which can result in miscarriage and isoimmunization reactions in Rh negative women
- Placental abruption, which can result in fetal or maternal death following seemingly minor abdominal trauma, especially during the 2nd or 3rd trimester

Traumatic Arrest of Pregnant Patient

Notes: In 2nd and 3rd trimester patients, perform chest compressions with hands placed higher on the sternum than on non-pregnant patients (patient should be placed in supine position). To relieve aorto-caval compression during CPR, manually displace the uterus to the patient's left.

If the patient is on a magnesium drip, stop the drip immediately.

Defibrillation indications and settings are the same as for non-pregnant patients. If fetal monitoring equipment is in place, remove it prior to defibrillation attempt, if feasible. Do not delay defibrillation for this intervention.

Notify receiving hospital as soon as possible, to prepare for a possible resuscitative caesarean section, which can enhance survivability of both mother and fetus.

Mat-Su Borough EMS



Section 5 **OB/GYN** **Protocols** (Including Newborn Resuscitation)

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OBSTETRIC EMERGENCIES

Numerous medical emergencies may arise involving pregnancy or childbirth. Pre-hospital intervention for this type of emergency is limited, but EMS responders should be familiar with these conditions, and able to provide appropriate care. Pregnancy should be included in the differential diagnosis for all women of childbearing age until it can be definitively ruled out.

Among the obstetric emergencies an EMS responder may encounter are:

<i>Antepartum (before delivery) hemorrhage</i>	<i>Prolapsed cord / nuchal cord</i>
<i>Pregnancy induced hypertension</i>	<i>Breech or limb presentation</i>
<i>Pre-eclampsia / eclampsia</i>	<i>Postpartum (after delivery) hemorrhage</i>
<i>Imminent childbirth</i>	<i>Other delivery complications</i>

In these cases the EMS provider generally should:

1. Initiate rapid transport immediately
2. Alert the receiving facility promptly
3. Make a thorough evaluation, and provide accurate, timely information to the receiving facility

Obtain as much of the following pre-delivery information as is practical:

1. Due date (EDC) or suspected length of pregnancy
2. Number of total pregnancies (gravida) and number of live births (para)
3. Expected multiple births
4. Membrane rupture (time/color/odor)
5. Last menstrual period (LMP)
6. Prenatal care
7. Signs of imminent delivery:
 - Crowning
 - Urge to push (patient feels need to move bowels)
 - Time between contractions
8. Pertinent medical history
9. Current medications and allergies
10. Unusual complications (eclampsia, placenta previa, etc.)

Document as much of the following post-delivery information as is practical:

1. Time of delivery
2. Presence of a nuchal cord
3. Appearance of amniotic fluid (clear, green, brown, blood streaked)
4. Time placenta was delivered
5. APGAR Scores (one minute post-birth and five minutes post-birth)

DO NOT perform an internal or digital vaginal examination

Document any resuscitation needed, and the infant's response, on the infant's PCR

ANTEPARTUM HEMORRHAGE

Very serious complications of pregnancy that can cause severe bleeding prior to birth include:

- **Ectopic pregnancy:** Implantation outside of the uterus causes bleeding and abdominal pain, usually during the first trimester
- **Spontaneous abortion:** Spontaneous abortion (miscarriage) or threatened abortion (impending miscarriage), is characterized by abdominal pain and/or bleeding
- **Placenta previa:** Placenta overlying the cervix may cause (usually painless) bleeding
- **Abruptio placenta:** Separation of the placenta from the uterine wall causes bleeding that is often accompanied by abdominal pain
- **Uterine rupture:** This is accompanied by sudden, severe abdominal pain and shock. If it occurs during labor, the intensity of contractions may decrease
- **Other:** Remember that other events, including some unrelated to pregnancy, may also cause vaginal bleeding

**Transport without delay if any of these are identified
Notify the receiving facility promptly**

Routine EMS Care

ETT	<p>Provide oxygen per protocol</p> <p>If patient is in 2nd or 3rd trimester position her on her left side or use a pillow or folded blanket to tilt her to the left, to move the fetus off of her inferior vena cava</p> <p>Keep patient warm</p> <p>Transport and Contact Medical Control ASAP</p> <p>Continually monitor vital signs and LOC during transport</p> <p>Quantify blood loss by keeping track of number of OB pads saturated</p>
EMT-2	<p>Establish vascular access – treat aggressively for shock (Vascular access should be above the diaphragm for 2nd & 3rd trimester patients)</p>
EMT-3	<p>Provide continuous cardiac monitoring for evidence of shock or unstable vital signs</p>

Again, **RAPID TRANSPORT MUST BE INITIATED** any time significant vaginal hemorrhage is present or internal bleeding is suspected!

Note: Do not perform a vaginal exam. An internal vaginal exam can result in increased hemorrhage, and possible increased chance of intrauterine infections for some etiologies of vaginal bleeding.

PREGNANCY WITH HYPERTENSION (Pre-eclampsia and Eclampsia)

Hypertensive disorders of pregnancy are the second most common cause of maternal death in the US, accounting for 15% of maternal deaths, and can also result in fetal/infant morbidity and mortality.

Hypertension Defined as BP \geq 140/90, a 20 mmHg rise in SBP or 10 mmHg rise in DBP
During Pregnancy: over the patient's baseline (blood pressure normally declines during pregnancy). Hypertension during pregnancy can result in maternal/fetal morbidity and mortality, and warrants immediate hospital evaluation.

Pre-eclampsia: A combination of hypertension and proteinuria during the second half of pregnancy – this may result in edema of hands/feet/face, headaches, visual disturbances, and abdominal pain. Pre-eclampsia can result in maternal/fetal/infant morbidity and mortality.

Eclampsia: Defined as seizure superimposed on the condition of pre-eclampsia – this is a life-threatening emergency.

When assessing these patients, include evaluation of CNS status and cardio-respiratory function. Specific items of importance are:

- Verification (by history or observation), of tonic/clonic seizure activity
- Gestational age of the fetus (verify due date)
- Any previous Hx of pregnancy induced hypertension (PIH)

IMMEDIATELY TRANSPORT ANY PATIENT WITH S/S OF PRE-ECLAMPSIA OR ECLAMPSIA!

Routine EMS Care

ETT	<p>Keep patient calm – dim lights, minimize noise</p> <p>Place patient in left lateral recumbent position</p> <p>Provide high-flow oxygen</p> <p>Monitor closely for seizure or pulmonary edema</p> <p>Continue rapid transport – monitor vitals and LOC continuously</p>
EMT-1	If seizure occurs – check BGL (See Adult Medical – AMS or Coma, if BGL <60)
EMT-2	<p>Establish vascular access – NS TKO</p> <p>(Vascular access should be above the diaphragm for 2nd & 3rd trimester patients)</p>
EMT-3	<p>Provide continuous cardiac monitoring</p> <p>If patient is seizing¹ – give diazepam 5 mg slow IV/IO -or- midazolam 2.5 mg IN if vascular access is not available</p> <p>(Repeat only by Medical Control order unless contact is not feasible – in these cases repeat same dose every 2-3 minutes if seizure continues – prepare to support oxygenation/ventilation afterward)</p>
EMT-3A	<p>May administer midazolam IV/IO or IM at the same dose</p> <p>When seizure has occurred, contact Medical Control – request possible orders for magnesium sulfate²</p>

Note 1: If the source of seizure is suspected to be hypoglycemia or OD – See Adult Medical Section – Altered Mental Status or Coma

Note 2: IV magnesium administration requires continuous cardiac monitoring. Dosing is guided by Medical Control because the optimum dose is variable. Boluses should be given slowly. 2 g over 20 minutes followed by 1-2 g/hr infusion is a possible dose. If patient develops hypotension, bradycardia, heart conduction block or respiratory insufficiency, discontinue magnesium sulfate. Reassess, give supportive care, and contact Medical Control ASAP.

POSTPARTUM CARE OF THE NEWBORN

Take the following actions as quickly as possible upon delivery of the baby:

- **Note time and date of delivery**
- **Dry the baby immediately and keep warm** – especially the head
- **Suction ONLY if baby is not vigorous, has difficulty initiating spontaneous breathing or requires positive pressure ventilation PPV.** Do not suction vigorous newborns with normal respirations, even if meconium is present. Repeat suctioning as needed.

If thick meconium is present, and baby is not moving or crying vigorously, suction deeply and aggressively before stimulating to clear airway as much as possible.

If MICP or EMT-3A is present, intubation and deep tracheal suctioning is preferred.

Vigorous newborns with meconium staining do **not require endotracheal suctioning.**

- **Stimulate the baby** by rubbing the back or flicking the soles of the feet (this normally causes the baby to begin crying and breathing within 30 seconds)
 - **If there are no spontaneous respirations within 30 seconds, or if heart rate <100 bpm, perform neonatal resuscitation** as follows:
 - **Ventilate at 30-40 breaths/minute** with infant BVM (observe for chest rise)
 - If no pulse, or pulse <60 bpm, **begin chest compressions**
 - **Follow appropriate cardiac algorithm** (See OB/Gyn Section – Newborn Resuscitation Algorithm)
 - **Contact Medical Control** (if not already done)
 - **Obtain 1-minute APGAR score** (See Appendix – Assessment Scales)
 - **Place two clamps on umbilical cord** 8-10" from baby's body
- Notes:** Clamping of the cord should be delayed at least 1 minute after delivery unless separation is needed for resuscitation of the mother or newborn.
- Clamping and cutting the cord is not an immediate priority, but until the cord is clamped, be careful to keep the baby level with the mother to prevent blood flow between mother and baby that may cause anemia or heart failure in the baby (depending on direction of flow).
- **Cut cord between clamps** with clean scissors (well sanitized with materials on hand)
If there is any bleeding from the cord end, re-clamp close to the "leaking" clamp
 - **Watch for placenta to deliver** (do NOT pull on cord), place in leak-proof bag, and bring to hospital with baby
 - **Encourage the mother** to hold the baby next to her (unless the condition of either contraindicates this)
Wrap baby and mother together in blanket for warmth
 - **Obtain 5-minute APGAR score**

Note: If resuscitation is needed, obtaining the APGAR score is a very low priority. At birth, the priorities for a newborn are: drying, warming, positioning, stimulating (with suction only if needed). If, after 30 seconds, the newborn remains apneic or is bradycardic (heart rate <100), begin resuscitation with assisted ventilations as described under the Newborn Resuscitation Algorithm – this section. Again, newborn resuscitation should NOT be delayed to assess APGAR score.

DELIVERY COMPLICATIONS

Most deliveries will proceed without serious incident. However, the EMS provider must be prepared for certain complications that may be encountered. Some of the more common ones (and appropriate responses) are:

Nuchal Cord: Umbilical cord around baby's neck during delivery:
Slip two fingers around the cord and lift it over the baby's head
 If unsuccessful:

1. **Clamp cord** in two places
2. **Cut cord** between clamps with clean scissors (blunt side next to baby – never use a scalpel!)
3. Allow cord to **release from baby's neck**

 Continue with **normal delivery process**

Prolapsed Cord: Umbilical cord protruding from vagina, before baby:
 Place mother in **knee-chest position** (mother on knees, hips elevated)
Protect cord from being compressed and inhibiting blood flow:

1. Put on clean gloves
2. Push firmly on baby's head or other presenting part to raise it off of cord and prevent compression with loss of blood flow

Palpate cord for pulsations indicating blood flow
Keep exposed cord moist and warm
Keep gloved hand in position to protect cord during transport
 Immediately begin **rapid transport – contact Medical Control ASAP**
Do not remove hand until relieved by OB personnel

Breech Birth: Legs or buttocks presenting first from birth canal:
NEVER attempt to pull baby from vagina by the legs or trunk
Immediately begin rapid transport – contact Medical Control ASAP
If delivery cannot be delayed until arrival at ER, assist as follows:

- After shoulders are delivered, **gently elevate trunk and legs** to aid in delivery of head (if baby presents face-down)
- If baby's head does not deliver spontaneously within 30 seconds, reach two fingers into the vagina and locate the baby's mouth. **Gently flex the baby's head to assist delivery**
- If baby's head does not deliver, **press vaginal wall away** from baby's mouth to **create an airway**
- If 2 minutes pass after delivery of trunk without delivery of the baby's head, **keep hand in place, and transport ASAP**

Extremity Presentation: Arm or leg protruding from birth canal:
DO NOT attempt out-of-hospital delivery!
Immediately begin rapid transport – contact Medical Control ASAP
Keep mother as calm as possible – encourage slow, deep breathing

DELIVERY COMPLICATIONS (continued)

Shoulder Dystocia:

Baby's anterior shoulder is impeded by mother's symphysis pubis, preventing delivery. Head may emerge, but delivery does not progress. Typically, head emerges with contractions, and then withdraws:

- Immediately place the mother supine, with **thighs flexed**, and **knees pulled toward ears**. Grasp the exposed part of baby and gently try to guide baby outward.
- If the baby fails to deliver, keep the mother in this position while applying **suprapubic pressure**. Place a hand low on the mother's abdomen, where the baby's shoulder is located and exert pressure posteriorly (toward the mother's spine). Initially pressure can be continuous, but if delivery does not occur, use a rocking motion somewhat similar to CPR, with gentle attempts to guide baby outward.
- **Contact Medical Control immediately and Initiate Rapid Transport**

Note: For complications of delivery, apply oxygen to the mother, and consider IV access, but do not delay the above interventions.

PRE-TERM LABOR / PRE-TERM DELIVERY

PRE-TERM LABOR

A normal gestation is 40 weeks. True labor that begins before 38 weeks is called pre-term labor.

Commonly reported signs and symptoms of pre-term labor include abdominal cramps or contractions, sensation of pelvic pressure, low back pain and pressure, leaking of fluid from the vagina (premature rupture of membranes), etc.

Pre-hospital Interventions

ETT	Assess patient¹ and provide supportive care Transport – preferably in left lateral recumbent position Provide oxygen per protocol
EMT-2	Establish vascular access – give 1 L NS bolus (may decrease rate of contractions) Note: give nothing by mouth Contact Medical Control with pre-hospital report Note: premature rupture of the membranes can result in a life-threatening intrauterine infection

Note: Do not perform a vaginal exam. An internal vaginal exam can result in increased hemorrhage, and possible increased chance of intrauterine infections for some etiologies of vaginal bleeding.

POSTPARTUM CARE OF THE MOTHER

Once the baby has been delivered, the placenta should deliver within a few minutes to ½ hour. If delivered, bring the placenta to the hospital:

- DO NOT pull on cord to facilitate placental delivery
- DO NOT delay on scene waiting for the placenta to deliver

In most cases of healthy, uncomplicated birth, simple postpartum monitoring en-route to the OB facility will be all that is needed for the mother. In some cases though, the following may occur:

Perineal tear: ETT **If the perineum is torn and bleeding, apply direct pressure** to outside of vagina with trauma dressing

DO NOT PACK VAGINA

Observe for excessive bleeding

Continue Routine EMS Care (oxygen, reassessment of VS & LOC)

EMT-2 **Obtain vascular access** – provide **NS bolus** to treat shock
Reassess and repeat as needed

Postpartum May be due to placental fragments that fail to deliver:

Hemorrhage ETT **Continue Routine EMS Care** (oxygen, reassessment of VS & LOC)
Massage fundus (exterior of abdomen over the uterine area)

Encourage mother to breast feed baby

(this stimulates uterine contraction and may help to stop bleeding)

EMT-2 **Consider 2nd vascular access site** – provide **NS boluses** to treat shock (reassess and repeat as needed)

Begin rapid transport

Uterine inversion Rare complication – uterus turns inside-out and extends outside of cervix – patient presents with profound shock – blood loss can be 1000-1800ml:

EMT-1 **Make ONE attempt to replace the uterus** as follows:

1. Place palm of hand on the distal end of prolapsed uterus
2. Push it back toward the vagina

If unsuccessful, cover uterus with saline-moistened dressing or towel

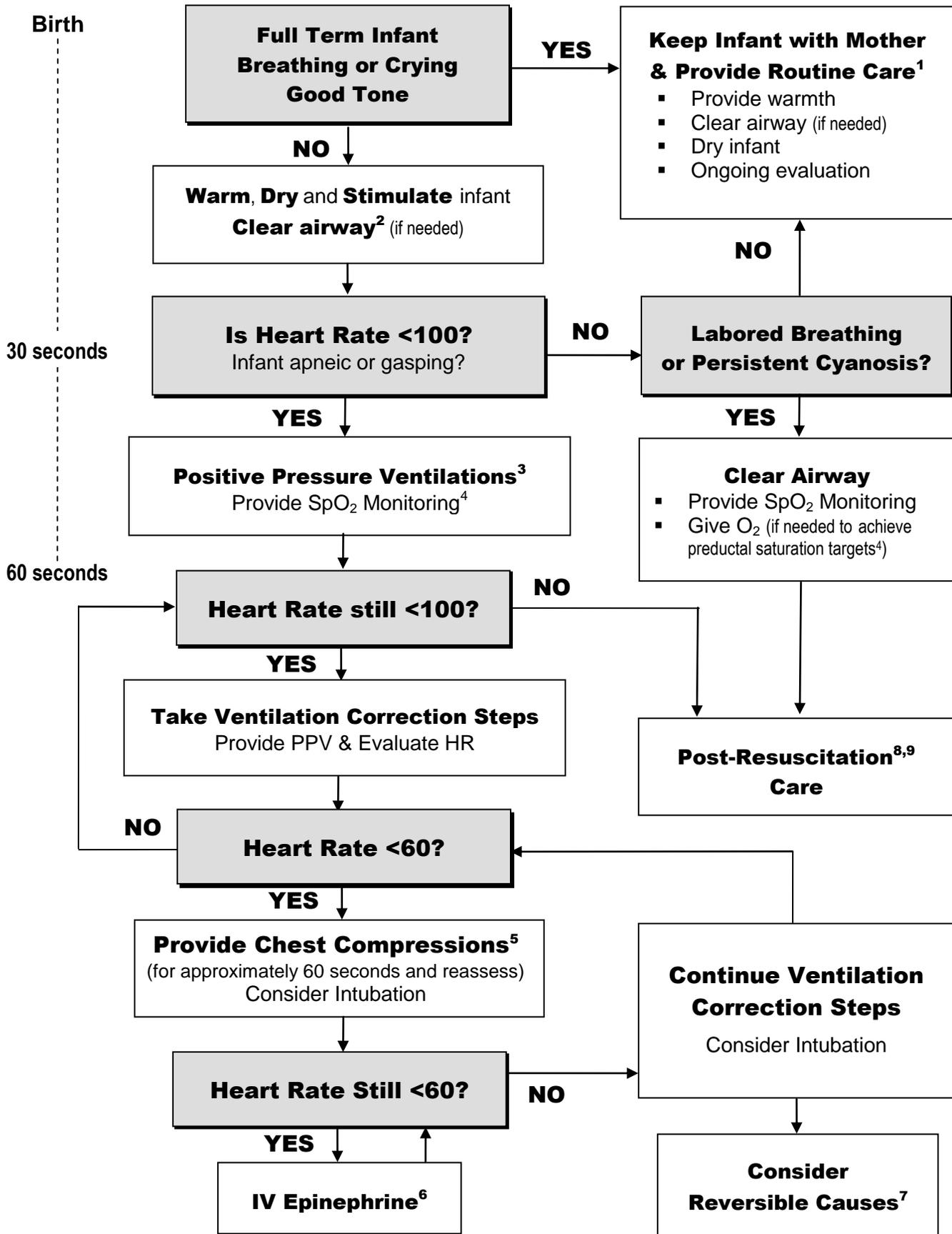
EMT-2 **Obtain vascular access** – provide **NS bolus 20ml/kg** (up to 1 L) to treat shock

Re-assess and repeat as needed

Immediately begin rapid transport

**If ANY of these complications occur,
CONTACT MEDICAL CONTROL ASAP!**

NEWBORN RESUSCITATION ALGORITHM



NEWBORN RESUSCITATION ALGORITHM – NOTES

- Note 1:** If the newborn does not require resuscitation, minimize the time the infant is separated from the mother. The newborn should be dried, placed skin-to-skin with the mother (if feasible), covered with dry linen, and observed for: temperature maintenance, adequate respirations, and activity.
- Note 2:** Suction should be reserved for newborns who have obvious obstruction to spontaneous breathing or who require ventilatory assistance.
There is insufficient evidence that active babies benefit from suctioning, even in the presence of meconium, and there is evidence of risk associated with this suctioning.
 If suction is needed, suction mouth first, then suction nose.
 Brief attempts at endotracheal suctioning of meconium stained, nonvigorous newborns may be attempted by EMT-3A/MICP providers. If these attempts are unsuccessful, begin PPV as needed.
- Note 3:** Positive pressure ventilation at 40-60 breaths/minute should initially be provided with room air. Supplemental O₂ should not be given unless bradycardia continues beyond 90 seconds of PPV with room air. For persistent bradycardia despite >90 seconds of PPV, oxygen may be titrated to achieve target SpO₂ levels or administer 100% oxygen, and continue until HR >100 bpm. (Delivery of 100% O₂ can be achieved by running oxygen at 5-10 lpm through the bag-valve device with reservoir.)
- Note 4:** Place the pulse oximeter on the newborn's RIGHT upper extremity to assess preductal SpO₂ (See chart) →
 As illustrated in the chart, a newborn normally has diminished oxygen saturations and some cyanosis for the first several minutes of life. Both hypoxemia and hyperoxemia can be detrimental to the newborn. Ideally, supplemental oxygen should be administered if needed, during resuscitation, and in the presence of persistent cyanosis, to achieve the preductal SpO₂ levels in the table. Although hypoxia is to be avoided, excessive or needless supplemental O₂ can also be detrimental.
- | Target Preductal SpO₂ Levels After Birth | |
|--|-----------|
| 1 minute – | 60 to 65% |
| 2 minutes – | 65 to 70% |
| 3 minutes – | 70 to 75% |
| 4 minutes – | 75 to 80% |
| 5 minutes – | 80 to 85% |
| 10 minutes – | 85 to 95% |
- Note 5:** Chest compressions are indicated for HR <60 bpm despite adequate ventilation and addition of supplemental oxygen. Compressions are delivered on the lower 1/3 of the sternum to a depth of 1/3 the chest diameter. Compression to ventilation ratio should be 3:1 (120 events/minute), and should continue until HR is ≥60 bpm.
- Note 6:** Epinephrine can be considered for persistent bradycardia despite adequate ventilation with oxygen and chest compressions. The preferred dose/route is 0.01-0.03 mg/kg (0.1-0.3 ml/kg) epinephrine 1:10,000 via IV/IO. ET administration can be considered if vascular access cannot be obtained, although it is considered less effective than intravascular epinephrine. The ET dose is 0.05-0.1 mg/kg (0.5-1.0 ml/kg) epinephrine 1:10,000.
- Note 7:** Reversible causes include:
- Hypovolemia – volume expansion via **NS 10 ml/kg** slow IV over 5-10 min (repeat if needed)
 - Hypoglycemia – **D₁₀W** may be given for newborn cardiopulmonary depression with BGL <40
 Mix **1 part D₅₀** to **4 parts sterile H₂O** give **2 ml/kg** IV/IO (slowly over 2-3 min)
 - Tension pneumothorax – EMT-3A/MICP perform decompression (See Appendix – Needle Decompression)
 - Narcotic effects – naloxone is generally not recommended in the initial phases of resuscitation of the newborn. Authorization by Medical Control must be obtained and documented prior to using naloxone.
- Note 8:** Post-resuscitative care includes:
- Supporting ABCs, and resume BLS if needed
 - Temperature control⁹
 - Transport and contact with Medical Control (if not already initiated)
- Note 9:** Temperature control for responsive newborns includes warming to normothermic temperature levels. Newborns that undergo prolonged resuscitation and who are unresponsive, despite resumption of adequate respirations and HR >100, may benefit from post-resuscitative hypothermia, with a target temperature range of 92-94°F (33.5-34.5°C)
 Contact Medical Control and request EMS post-resuscitative care team to guide therapy.

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MAT-SU BOROUGH EMS



Section 6 **PEDIATRIC MEDICAL Protocols**

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PEDIATRIC EMERGENCY REFERENCE CHART

The standard of care for pediatric assessment is the Pediatric Resuscitation Tape (Broselow Tape) which, by measuring the length of the child, provides an estimate of the child's weight, appropriate emergency equipment, and medication doses. This is more accurate, more efficient, and safer than attempting to remember these values. Document use of the tape on the PCR. The following chart may be used as an adjunct as needed.

Blood volume

Estimated blood volume is 80 ml/kg

Ventilatory rate

(no CPR in progress)

Infant	1 breath each 3-5 seconds
Child to adolescent	1 breath each 3-5 seconds
Adolescent to adult	1 breath each 5-6 seconds

ET tube / suction catheter size

<u>Age</u>	<u>Tube Size</u>	<u>Suction Catheter Size</u>
Term infant	3-3.5mm	6.5 french
3-12 months	4	8
1-2 years	4-4.5	8
2-5 years	4.5-5	8
5-10 years	5.5-6.5	10
10-15 years	6.5-7.5	14

Average respiratory rate

Newborn	50 bpm (breaths per minute)
Infant	40
Toddler	30
Pre-schooler	30
School age	20
Adolescent	20

Average heart rates

Infant	120-150 bpm (beats per minute)
Toddler	90-140
Pre-schooler	80-120
School age	75-110
Adolescent	60-100

Average blood pressures

Infant	80/50 mmHg
Toddler	90/60
Pre-schooler	96/65
School age	110/70
Adolescent	120/70

Weight estimation

Newborn	3-5 kg
1 year old	10 kg
3 years	15 kg
5 years	20 kg
8 years	25 kg
10 years	30 kg
12 years	35 kg

Note: Unless otherwise specified, patients who are post-puberty or ≥50 kg (110 lbs) should be treated per adult protocol

PEDIATRIC EMERGENCY DRUG DOSAGE CHART

Drug Name	1st Dose	Repeat Dose	Route / Other info
Acetaminophen	15 mg/kg (500 mg max dose)		<u>Route:</u> PO
Activated Charcoal	1 g/kg	Per Medical Control Direction	<u>Route:</u> PO Pt<32 kg (70 lbs) use non-sorbitol
Adenosine (Adenocard)	0.1 mg/kg (6 mg max ea dose)	Repeat x2 at 0.2 mg/kg (12 mg max ea dose)	<u>Route:</u> rapid IVP followed by NS bolus
Albuterol	Pt age <6 months - 1.25mg (½ unit dose) Pt age ≥6 months - 2.5mg (unit dose) Administer up to 3 doses prior to Medical Control contact		<u>Route:</u> nebulizer If Medical Control contact not available, may repeat dosing as needed for critical patient
Amiodarone	5 mg/kg (max 300mg)	Repeat same dose @ 3-5 min (pulseless pts) 10 min (pts with pulses)	<u>Route:</u> IV/IO slow push (pulseless pts) over 20-60 min (pts with pulses)

PEDIATRIC EMERGENCY DRUG DOSAGE CHART (cont'd)

Drug Name	1st Dose	Repeat Dose	Route / Other info
Atropine	0.02 mg/kg (min. 0.1mg)	Repeat doses @ 0.02 mg/kg	<u>Route:</u> IV/IO or ET (double dose)
Dextrose (D₅₀, D₂₅, D₁₀)	Age ≥ 2 yrs 0.5 g/kg D ₅₀ (max 25g – 1ml/kg) Age < 2 yrs 0.5 g/kg D ₂₅ (2ml/kg volume) Age < 1 mo 0.2g/kg D ₁₀ (2ml/kg volume)		<u>Route:</u> slow IV/IO or PR (D ₂₅ = 1:1 mix NS & D ₅₀) (D ₁₀ = 1:4 mix sterile H ₂ O & D ₅₀)
Diazepam (Valium)	Pt <20kg (44lbs) 0.2 mg/kg Pt ≥20kg Adult dose	Repeat x1 Contact Medical Control for additional doses	<u>Route:</u> slow IV/IO (consider IM or Rectal if other route not available) If no Medical Control available, repeat as needed @ 5-min intervals for patient in status epilepticus
Diltiazem (Cardizem)	By Medical Control direction only		
Diphenhydramine (Benadryl)	1 mg/kg	Per Medical Control	<u>Route:</u> slow IV/IO (over 1 min), IM
Epinephrine 1:10,000	0.01 mg/kg (0.1 ml/kg)	Per Protocol/Algorithm	<u>Route:</u> IV/IO or ET (use 1:1000 solution @ 0.1 ml/kg for ET)
Epinephrine 1:1000	0.01 mg/kg IM (max 0.3 mg)	Per Protocol/Algorithm	<u>Route:</u> IM or nebulized (nebulized only by Medical Control order See Medications – Epinephrine 1:1000)
Fentanyl (sublimaze)	0.5-1.0 mcg/kg	Same dose after 10 min	<u>Route:</u> slow IV/IO or IN
Furosemide (Lasix)	By Medical Control direction only – usual dose is 1 mg/kg		
Glucagon (for hypoglycemia)	0.5 mg (½ dose) repeat per protocol Note: Pt >20 kg (44 lbs) receives adult dose		<u>Route:</u> IM (may be given IO or IV See Medications - Glucagon)
Ipratropium Bromide (Atrovent)	Age <u>6 mo to 12 yrs</u> – 0.25 mg (½ unit dose) (For repeat, see Medications – Ipratropium Bromide)		<u>Route:</u> nebulized
Lidocaine	1 mg/kg	Repeat ½ dose @ 5-10 min (max total 3 mg/kg)	<u>Route:</u> IV/IO or ET (2-2.5x dose for ET)
Lidocaine Premix	By Medical Control direction only – usual dose 0.02 to 0.05 mg/kg/minute		
Magnesium Sulfate	For pulseless Torsades de Pointes: 25-50 mg/kg (max single dose 2 g)		<u>Route:</u> IV/IO other indications by Medical Control only
Methylprednisolone (Solu-Medrol)	2 mg/kg		<u>Route:</u> slow IV/IO
Midazolam (Versed)	0.05 mg/kg (max single dose 2.5 mg) sedation 0.2 mg/kg (max single dose 5 mg) seizure		<u>Route:</u> slow IV/IO, IM or IN
Morphine	≥6 yrs – 0.1 mg/kg (max single dose 4 mg) <6 yrs – Medical Control Direction only		<u>Route:</u> slow IV/IO or IM
Naloxone (Narcan)	0.1 mg/kg (max single dose 2 mg)	Titrate to respirations	<u>Route:</u> IV/IO, IM, IN or ET (2-2.5x dose for ET)
Normal Saline 0.9% TKO to bolus (see boluses) →	Age <6 days – 10 ml/kg & reassess Age ≥6 days – 20 ml/kg & reassess Pt w/cardiac depression – 5 ml/kg		<u>Route:</u> IV/IO
Ondansetron (Zofran)	0.1 mg/kg (max single dose 4 mg)	May repeat x1 prior to Medical Control contact	<u>Route:</u> slow IV/IO (over 2-5 min) or IM (IV is preferred route)
Oral Glucose	15 g	Titrate to BGL	<u>Route:</u> PO, buccal or PR
Phenylephrine HCl (Neo-synephrine spray)	3 sprays to the nostril(s) (for patients ≥12 years old)		<u>Route:</u> IN
Sodium Bicarbonate	1 mEq/kg		<u>Route:</u> IV/IO

Note: More complete information can be found in Medication Section – individual formularies

INITIAL PEDIATRIC ASSESSMENT

A rapid initial pediatric assessment is imperative for the delivery of good pre-hospital care. An accurate initial impression of a pediatric patient can be quickly gathered by noting:

- A. APPEARANCE:** patient alert, oriented – aware of surroundings and events?
- B. WORK of BREATHING:** patient laboring to breathe – accessory muscle use – retractions?
- C. CIRCULATION to the SKIN:** pale, cyanotic – bluish lips or extremities – capillary refill?

Often, this can be done visually, prior to actual hands-on contact with the patient. Rapid initial assessment is essential to determine the urgency for treatment and transport.

History is also an essential element in forming an initial pediatric assessment. Important points to consider with any ill pediatric patient are as follows:

WHAT: are the symptoms?

WHEN: did the symptoms begin?

HOW LONG: have the symptoms lasted?

Children have significant ability to compensate for respiratory deficiencies or hypoperfusion. However, **once a child loses the ability to compensate, rapid decompensation will occur**, and cardiopulmonary failure or arrest will follow.

For the reason listed above, rapid physical assessment of the pediatric patient is critical. The outcome of cardiac arrest in pediatric patients is poor, so prevention by early recognition, and treatment of respiratory or circulatory dysfunction is essential. Rapid physical assessment begins with the following:

1. **Airway-Ventilation** – assess airway status and treat accordingly

Clear – no airway assistance needed

Maintainable – airway can be maintained with: head positioning or suctioning, supplemental oxygen

Unmaintainable – airway requires support: BVM / supplemental oxygen, intubation, King Airway or other adjuncts, if patient cannot be adequately ventilated via BVM

2. **Breathing-Oxygenation**

Observe – facial expression, nasal flaring, accessory muscle use, retractions

Expose – chest to observe effort, rate, and effectiveness

Auscultate – effectiveness of ventilations, airway obstructions

3. **Circulation-Perfusion**

Pulses – palpate femoral and pedal pulses – note quality and rate

Capillary Refill – should be <2 seconds for stable patient

Assess Level of Consciousness – alert

 failing to recognize or focus on parents
 failing to respond to pain

INITIAL PEDIATRIC ASSESSMENT (cont'd)

SIGNIFICANCE OF HYPOXIA IN THE PEDIATRIC PATIENT

Systemic deficit in oxygenation, ventilation or perfusion may result in the following conditions:

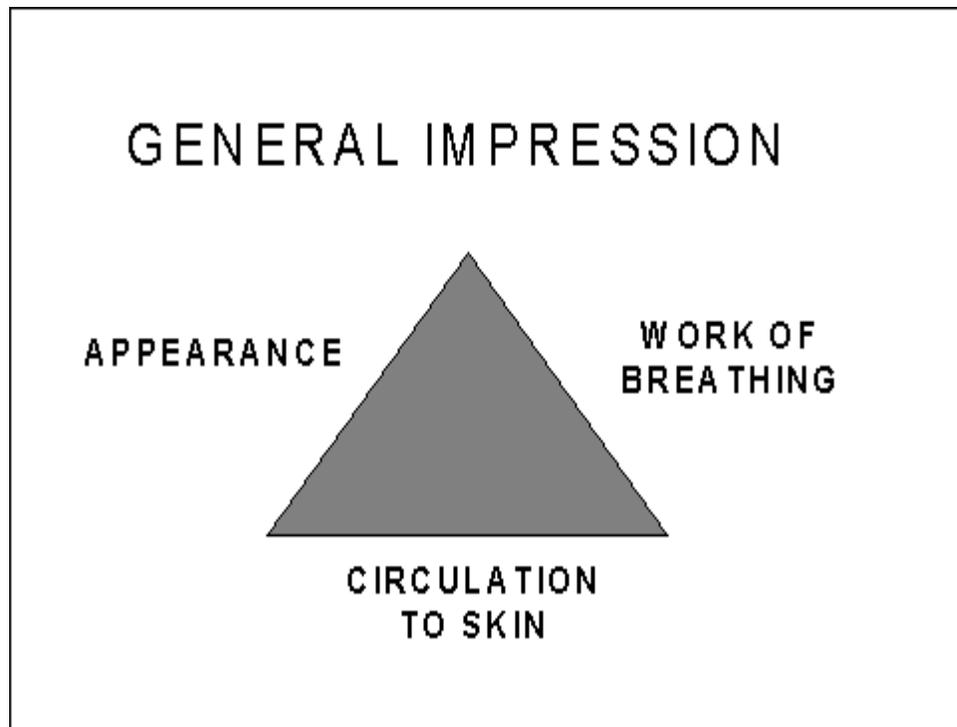
Cardiac dysrhythmia (usually bradycardia)
Ineffective respiratory patterns, and/or
Altered level of consciousness or ***neurological status***

REMEMBER: Pediatric cardiac arrest is usually caused by respiratory failure or arrest. Relieving the decompensated pediatric patient of the work of breathing, by assisting each breath with 100% oxygen via bag-valve-mask ventilation, often restores that patient to a compensated state long enough to reach the ER for definitive intervention and care.

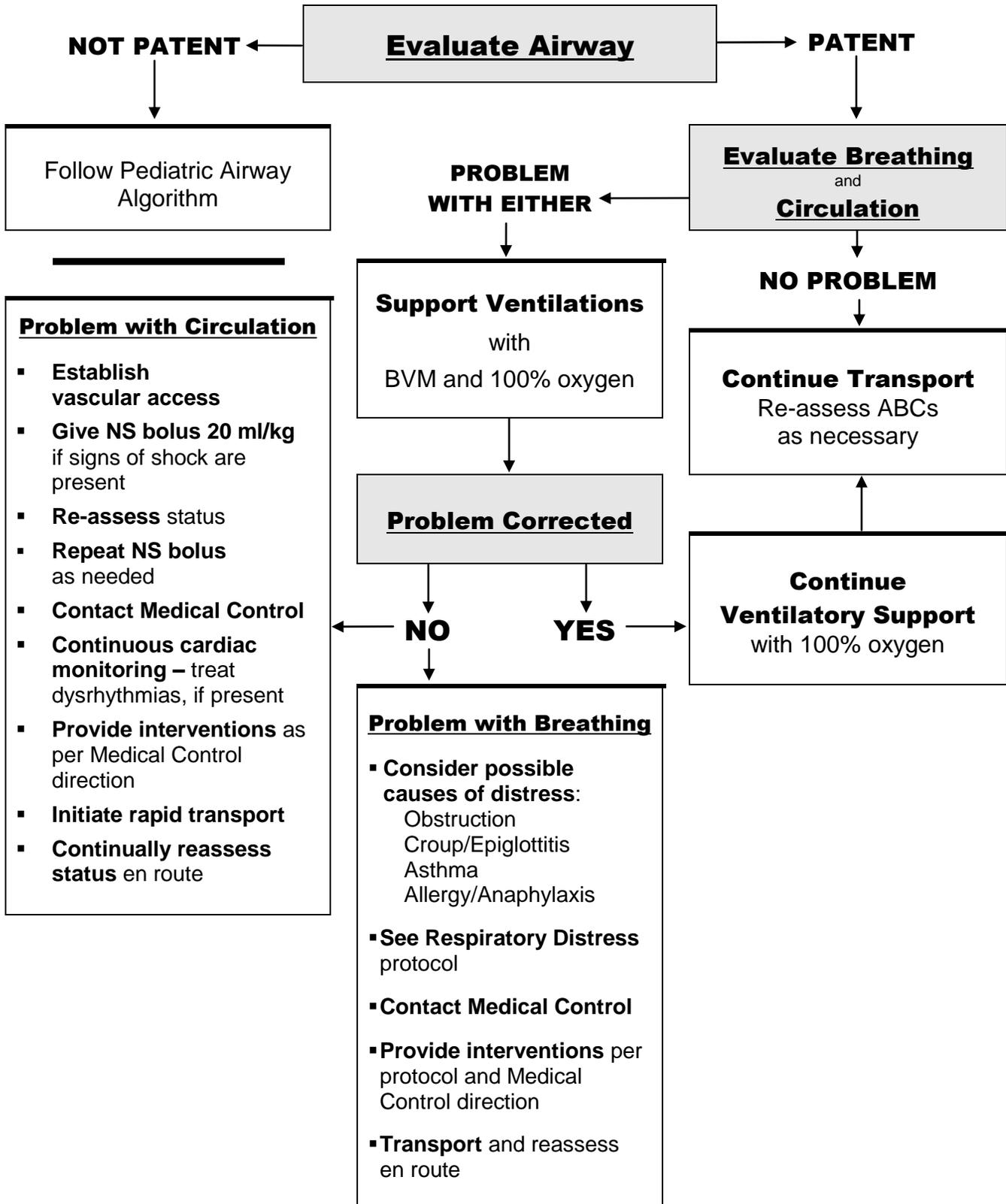
ASSESSING FOR SHOCK

When assessing for signs of shock in the pediatric patient, EMS responders must keep certain critical concepts in mind:

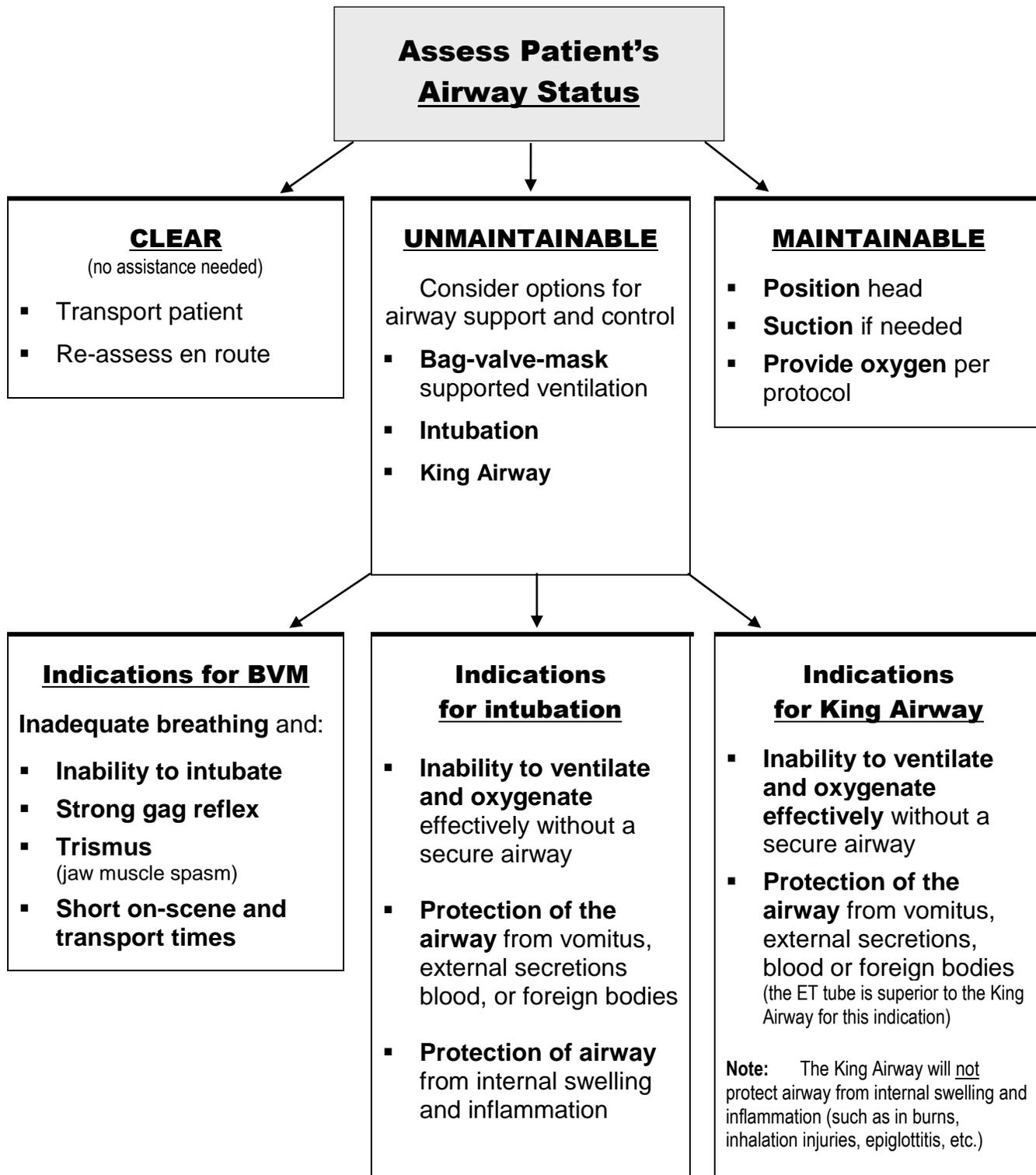
- The blood pressure of a pediatric patient is a poor indicator of perfusion status. A better indicator of adequate perfusion is **capillary refill time.**
- The blood pressure of a pediatric patient will be well maintained during the compensatory phase of shock, and will decrease precipitously when the child reaches the decompensated phase. Low blood pressure is a very late sign of hypoperfusion, and should not be relied upon for definitive assessment of patient stability.



INITIAL PEDIATRIC ASSESSMENT – ALGORITHM



PEDIATRIC AIRWAY - ALGORITHM



(For King Airway sizing information See Appendix – King Airway)

PEDIATRIC RESPIRATORY DISTRESS

GENERAL GUIDELINES / INFORMATION

Respiratory distress can be a life-threatening emergency. It requires immediate assessment and intervention. Although the etiology of respiratory distress in the pediatric patient may vary, clinical manifestations are similar. The small pediatric tracheal diameter contributes to an easily compromised airway. Respiratory distress may occur as a result of the following:

<u>Upper airway obstruction:</u>	Croup, Foreign body, Epiglottitis, Congenital anomalies, Edema, and Allergic reactions
<u>Lower airway obstruction:</u>	Asthma, Bronchitis, Pneumonia

For the pediatric patient in respiratory distress, rapid assessment with appropriate intervention is essential

1. **Check patency** of the airway: If the airway is clear and no assistance needed, provide oxygen per protocol, NRB or blow-by
2. **Properly position** the airway: Verify spontaneous, adequate respiratory effort, or...
3. **Provide ventilatory support:** Immediate intervention is required for severe distress, respiratory inadequacy or failure
Provide PPV via BVM with 100% oxygen
4. **Use airway adjunct:** Perform endotracheal intubation or insert a King Airway. This is indicated only if there is an inability to secure a patent airway, and ventilate the patient adequately via BVM.
Most children can be managed with BVM ventilation. Base the decision to insert advanced airway on response to BVM ventilations, and transport time to the ER

Signs, symptoms, and causes of upper airway obstruction: stridor and hoarseness are signs of upper airway distress. Foreign body aspirations and croup are the most frequent causes. Rarely, epiglottitis may occur - usually in children two to six years old who are unimmunized (occasionally in infants or adolescents). Onset is usually abrupt and associated with: stridor, severe dysphagia, high fever, and a toxic appearance. Croup (laryngotracheal bronchitis) usually occurs in the infant or toddler; its onset is more gradual, and associated with low-grade fever, barking cough, stridor and rapid respirations. Foreign-body obstruction may present as stridor, dysphagia or respiratory arrest.

Signs, symptoms, and causes of lower airway obstruction: decreased, unequal or absent breath sounds can occur. Respirations are usually rapid (but when expiration becomes prolonged, the rate may fall – an ominous sign). Also consider bronchiolitis, asthma, and foreign-body obstruction. Expiratory wheezing is the hallmark of lower airway obstruction.

Follow the general guidelines starting on the next page for pediatric patients in respiratory distress, regardless of etiology. See specific protocols as appropriate.

PEDIATRIC RESPIRATORY DISTRESS (cont'd)

TREATMENT PROTOCOL

Routine EMS Care

ETT **Protect and maintain airway** – position and suction as needed

Provide oxygen in the least irritating manner possible

Assess respiratory rate and effort – if inadequate, support ventilations with BVM using 100% O₂ (use BVM only if necessary – DO NOT overextend neck)

Assess for signs of respiratory distress:

- Accessory muscle use and/or retractions
- Tripod position
- Nasal flaring or noisy respirations
- Stridor, wheezing or “seal bark” cough
- Lethargy or altered LOC (this is an ominous sign)

Allow child to assume a position of comfort – such as on parent’s lap (verify position is safe for transport)

Determine approximate weight of the patient – use Pediatric Resuscitation Tape (Broselow Tape) if weight estimate is not available from parent or guardian

Note: unless otherwise specified, patients who are post-puberty or ≥50 kg (110 lbs) are to be treated per adult protocols

If airway is obstructed (See Pediatric Obstructed Airway – this section)

Assess history – form differential diagnosis – follow appropriate protocol:

- **Asthma** (See protocol – this section)
- **Croup/Epiglottitis** (See protocol – this section)
- **Allergy/Anaphylaxis** (See protocol – this section)

Initiate Rapid Transport – this is CRITICAL for pediatric patients in severe respiratory distress

Contact Medical Control ASAP

PEDIATRIC ASTHMA/BRONCHOSPASM

Specific Guidelines in addition to Routine Care

ETT	<p>Provide oxygen per protocol – ensure adequate ventilation</p> <p>Continually re-assess respiratory status and vital signs / oxygenation</p>
EMT-1	<p>Initiate transport – determine priority based on patient condition and available resources</p>
EMT-2	<p>Provide bronchodilator treatment for patients with asthma or wheezing:</p> <p style="padding-left: 40px;">Patient <6 <u>months</u> – albuterol 1.25 mg (½ unit dose) nebulized with 4-6 L/min O₂</p> <p style="padding-left: 40px;">Patient ≥6 <u>months</u> – albuterol 2.5 mg (unit dose) and Atrovent 0.25 mg (½ unit dose up to age 12 / full dose ≥ age 12) nebulized with 4-6 L/min O₂</p> <p>Notes: Bronchodilator treatments may be repeated up to 3 doses – contact Medical Control if more than three doses are needed¹</p> <p style="padding-left: 40px;">Nebulized bronchodilator treatments should be given in-line with BVM for patients with inadequate ventilations.</p> <p>Consider CPAP (See Appendix – Continuous Positive Airway Pressure)</p> <p>Consider vascular access – administer NS bolus 20 ml/kg</p> <p>Contact Medical Control for directions, which may include: Repeat nebulizer treatment (albuterol only or albuterol/Atrovent nebulizer Tx)</p>
EMT-3	<p>Provide continuous cardiac monitoring and pulse oximetry</p> <p>Contact Medical Control for directions, which may include: IM epinephrine 1:1000² – 0.01 mg/kg (0.01 ml/kg – maximum volume 0.3 ml)</p>
EMT-3A	<p>Contact Medical Control for directions, which may include: Solu-Medrol 2 mg/kg slow IV/IO if symptoms of bronchospasm continue despite 2 doses of bronchodilators (inform Medical Control if pneumonia or sepsis is suspected)</p>
MICP	<p>Consider Solu-Medrol 2 mg/kg slow IV/IO if symptoms of bronchospasm continue despite 2 doses of bronchodilators (contact Medical Control PRIOR to administration of Solu-Medrol if pneumonia or sepsis is suspected)</p>

Note 1: Seek Medical Control order if more than three doses of nebulized bronchodilators are needed. If delay in contacting Medical Control is potentially detrimental to a critical patient, EMT-2 may administer additional bronchodilator treatments as needed every 15 minutes. Contact Medical Control as soon as feasible. Many patients will require more than three doses of bronchodilators during transport.

Note 2: Epinephrine (1:1000) 0.01 mg/kg IM (up to 0.3 mg per dose) may be administered at the EMT-3 level and above, but is generally less effective and has more serious side effects than albuterol and Atrovent (for information on subsequent doses See Medication Section – Epinephrine 1:1000)

Note: (EMT-3A) contact Medical Control for possible nebulized epinephrine order in suspected bronchiolitis that fails to respond to albuterol/Atrovent. (See dosing information – Medication Section – Epinephrine 1:1000)

PEDIATRIC INFLAMMATORY AIRWAY OBSTRUCTION (Epiglottitis, Croup, Upper Airway Inflammation/Edema)

	<u>Specific Guidelines in addition to Routine EMS Care</u>
ETT	<p>Obtain history Assess for signs of respiratory distress, including:</p> <ul style="list-style-type: none"> • Presence of stridor • Respiratory rate and effort • Droling or mouth breathing • Degree of cyanosis • Increased skin temperature <p>IMPORTANT: <u>DO NOT</u> look in the patient's mouth!!! <u>KEEP PATIENT CALM</u> and sitting upright</p> <p>Allow child to achieve position of comfort (i.e. on parent's lap)</p> <p><u>Without agitating the child</u>, attempt to administer humidified oxygen via mask (held by parent or other familiar person) 4 inches from child's face, but ONLY if well tolerated by the child</p>
EMT-1	Initiate transport ASAP
EMT-3A	<p>Contact Medical Control for directions, which may include: Administer nebulized epinephrine 1:1000 (Re-assess and repeat as directed by Medical Control)</p> <p style="padding-left: 40px;">For child <1 year – 2.5 mg epinephrine 1:1000 (2.5 ml) mixed with 2.5 ml NS nebulized @ 6 lpm O₂</p> <p style="padding-left: 40px;">For child ≥1 year – 5 mg epinephrine 1:1000 (5 ml) neb. @ 6 lpm O₂</p> <p>Contact Medical Control for possible Solu-Medrol 2 mg/kg slow IV/IO</p> <p><u>DO NOT attempt vascular access</u> unless airway obstruction or respiratory failure occurs or Medical Control has authorized use of Solu-Medrol</p>

In the event the airway obstructs or respiratory failure occurs:

EMT-1	<p>Upgrade to Immediate Rapid Transport and Contact Medical Control</p> <p>Attempt ventilation with pediatric BVM and 100% oxygen Add humidified oxygen via in-line nebulizer (5 ml NS @ 6 lpm) ASAP</p> <p>Note: If ventilation with pediatric BVM is ineffective, attempt with adult BVM</p>
EMT-3A	<p>ET intubation may be indicated if BVM ventilations are still ineffective</p> <p>Note: For an unconscious patient, where epiglottitis is strongly suspected, EMT-3A/MICP may attempt direct laryngoscopy and ET intubation, ONLY if BVM ventilation fails to maintain air exchange and oxygenation. Bear in mind that intubation is difficult in epiglottitis, and attempts often worsen the state of the airway. Also consider using a smaller size ET tube than normal. (Note: King Airway is likely NOT effective for upper airway obstruction.)</p> <p>If intubation attempt is unsuccessful – contact Medical Control</p> <p><u>After</u> airway and breathing have been addressed – provide continuous cardiac monitoring and establish vascular access, if child is not vigorous</p>

PEDIATRIC FEVER

Routine EMS Care

ETT

Protect and maintain airway

Obtain history:

- Onset and duration of symptoms
- Interventions taken
- Assess for cause of fever
- Other pertinent medical history

Assess temperature (rectal is most accurate)

Cool the patient if temperature $>101^{\circ}\text{F}$

- Remove blankets/clothing if necessary (patient should be dressed lightly)
- Sponge patient with tepid water for cooling
- Dry and cover patient if shivering starts

Monitor temperature during transport

Be alert for potential febrile seizure

EMT-3A

If fever is due to infection, and patient has not received antipyretics in the past 4 hours, assess for possible contraindications to administration of acetaminophen. (Contraindications include: inability to swallow, severe respiratory distress, surgical indications, possible liver dysfunction.)

If no contraindications are identified, administer acetaminophen **15 mg/kg PO** (up to 500 mg)

Contact Medical Control if clarification is needed concerning potential contraindications, dosing, and administration.

If Febrile Seizure Occurs:

ETT

Protect patient from injury

Protect and maintain airway¹

Support ventilations via BVM w/100% O₂

Cool patient per above protocol

If seizure activity persists longer than 1 minute

(See Pediatric Seizure / Status Epilepticus – this section)

Note 1: During febrile seizure, patients may experience short-term respiratory arrest. Cyanosis around the lips and extremities often occurs. Be prepared to support ventilations if spontaneous respirations do not immediately resume.

PEDIATRIC OBSTRUCTED AIRWAY

If patient can still breath, cough, cry or speak
(color pale or pale-pink)

ETT **Provide routine BLS medical care**
Follow Pediatric Respiratory Distress Protocol
Provide Oxygen 100% via NRB held adjacent to face
Allow alert patient to sit with parent – keep child warm & calm, in position of comfort
If patient is conscious, but becomes totally obstructed, perform BLS airway-clearing maneuvers appropriate to age

If patient becomes unconscious or unable to breathe
(or is cyanotic with no air exchange)

Determine whether the obstruction is due to FBAO (foreign body airway obstruction) or Edema/Epiglottitis

Foreign Body Obstruction

ETT **Perform CPR/BLS airway-clearing maneuvers** appropriate to age

EMT-3A **Open airway** and attempt **direct observation** with laryngoscope

Attempt removal of foreign body using Magill forceps

If attempts to clear airway are unsuccessful:

Transport immediately

Continue CPR/BLS airway-clearing maneuvers

Attempt BVM ventilation with high pressure

Contact Medical Control ASAP

Suspected Inflammatory Airway Obstruction

(See Croup / Epiglottitis / Upper Airway Edema – this section)

PEDIATRIC ALLERGIC REACTION

STABLE PATIENT

BP within normal limits, good air exchange, minor to moderate skin manifestations, and/or mild to moderate respiratory distress without stridor

- ETT **Protect and maintain airway**
Provide oxygen per protocol
- EMT-2 If patient exhibits mild to moderate respiratory distress:
Give Nebulized albuterol
▪ Patient <6 months: **1.25 mg** (1/2 unit dose) w/100% O₂ 4-6 lpm
▪ Patient ≥6 months: **2.5 mg** (unit dose) w/100% O₂ 4-6 lpm
 mix with **Atrovent 0.25 mg** (½ unit dose up to age 12)
 or
 mix with **Atrovent 0.5 mg** (full unit dose ≥ age 12)
(may repeat nebulized bronchodilators up to 3 doses, prior to contact with Medical Control¹)
Consider CPAP (See Appendix – Continuous Positive Airway Pressure)
Consider vascular access (give NS TKO unless signs of shock develop)
- EMT-3 **Provide continuous cardiac monitoring**
If wheezing does not respond to albuterol and/or Atrovent:
Give IM epinephrine 1:1000 – 0.01 mg/kg (0.01 ml/kg) maximum single dose 0.3 mg
(contact Medical Control if additional epinephrine 1:1000 is needed²)
- EMT-3A **Contact Medical Control** for possible **nebulized epinephrine** order in cases that fail to respond to albuterol/Atrovent (See Medication Section – Epinephrine 1:1000)
Contact Medical Control to request orders for **diphenhydramine**
Note: Usual pediatric dose is 1 mg/kg (max 25 mg per dose) IM or SIVP (over 1 minute)
Contact Medical Control – request orders for **Solu-Medrol 2 mg/kg IV/IO**
- MICP May administer **diphenhydramine** to patients > age 12 without Medical Control order

Note 1: Contact Medical Control if more than three doses of nebulized bronchodilators are needed. If delay in contacting Medical Control is potentially detrimental to a critical patient, EMT-2 may administer additional bronchodilator treatments as needed every 15 minutes. Contact Medical Control as soon as feasible. Many patients will require more than three doses of bronchodilators during transport.

Note 2: If delays in contacting Medical Control are potentially detrimental to a critical patient, EMT-3 may repeat epinephrine 1:1000 IM at same dose every 15 minutes for a maximum of three doses. Contact Medical Control as soon as feasible.

PEDIATRIC ANAPHYLACTIC SHOCK

UNSTABLE PATIENT

Characterized by hypotension (according to normal values for age and weight), impending upper airway obstruction, stridor, severe wheezing and/or severe respiratory distress

Note: Anaphylactic shock may present **without** respiratory distress

- ETT **Provide airway management / assist ventilations via BVM** as needed
Provide oxygen therapy per protocol
- EMT-1 May administer patient's epinephrine prescribed autoinjector (contact Medical Control ASAP)
- EMT-2 **Vascular access – 20 ml/kg NS bolus**, initial Tx for shock (reassess/repeat as needed)
For bronchospasm:
- Give Nebulized albuterol**
- Patient <6 months: **1.25 mg** (1/2 unit dose) w/100% O₂ 4-6 lpm
 - Patient ≥6 months: **2.5 mg** (unit dose) w/100% O₂ 4-6 lpm
mix with **Atrovent 0.25 mg** (½ unit dose up to age 12)
or
mix with **Atrovent 0.5 mg** (full unit dose ≥ age 12)
- (may repeat nebulized bronchodilators once, prior to contact with Medical Control¹)
- If patient becomes critical or BVM ventilations are ineffective:
Place **King Airway** and assess for effectiveness
(ET intubation is the airway of choice IF airway swelling is present and EMT-3A/MICP resources present)
- EMT-3 **Give IM epinephrine 1:1000 – 0.01 mg/kg** (0.01 ml/kg – maximum single dose 0.3 mg – contact Medical Control if additional dose is needed²)
- Provide continuous cardiac monitoring**
- EMT-3A If patient becomes critical or BVM ventilations are ineffective:
Perform ET intubation
- Contact Medical Control** to request orders for the following:
- Diphenhydramine** slow IV/IO or IM (usual pediatric dose -1 mg/kg - max single dose 25 mg)
Note: Other doses may be authorized by Medical Control
 - IV glucagon** (dosing by Medical Control order for refractory anaphylaxis)
 - Nebulized epinephrine 1:1000** – for angioedema or impending airway obstruction (the usual dose for children ≥ age 1 is 5 mg [5 ml] nebulized with 6 lpm O₂ – children < age 1 receive 2.5 mg [2.5 ml] mixed with 2.5 ml NS)
 - Solu-Medrol 2 mg/kg** slow IV/IO (Medical Control contact not required for anaphylaxis)
- MICP May administer **diphenhydramine** to patients > age 12 without Medical Control order
Epinephrine slow IV/IO (usual pediatric dose - 0.1 ml/kg 1:10,000 – max dose 5 ml) **Contact Medical Control** prior to administering epinephrine IV/IO, if feasible.
Consider **epinephrine drip** (dosing by Medical Control if feasible – see formulary – Epinephrine 1:10,000)

Note 1: Contact Medical Control if more than two doses of nebulized bronchodilators are needed. If delay in contacting Medical Control is potentially detrimental to a critical patient, EMT-2 may administer additional bronchodilator treatments as needed every 15 minutes. Contact Medical Control as soon as feasible. Many patients will require more than two doses of bronchodilators during transport.

Note 2: If delays in contacting Medical Control are potentially detrimental to a critical patient, EMT-3 may repeat epinephrine 1:1000 IM at same dose every 15 minutes for a maximum of three doses. Contact Medical Control as soon as feasible.

PEDIATRIC DEHYDRATION

Pediatric patients are particularly susceptible to dehydration and can experience severe complications if left untreated. Common causes of dehydration are: vomiting, diarrhea, and insufficient fluid intake. Signs and symptoms of dehydration include:

- *Poor skin turgor*
- *“Sunken” eyes*
- *Depressed fontanelle (in infants)*
- *Delayed capillary refill (>2 seconds)*
- *Altered mental status*
- *History of vomiting or diarrhea*
- *Tachycardia*
- *Hypotension*
- *Cool extremities*
- *Lethargy*

TREATMENT

<u>Routine EMS Care</u>	
ETT	Provide oxygen per protocol (blow-by or nasal cannula for nauseated patient) Monitor vital signs Transport
EMT-2	Obtain vascular access (defer if patient is stable and IV not obtainable) Administer fluid bolus – NS 20 ml/kg (over period less than 20 minutes) Re-evaluate – vital signs and capillary refill Repeat fluid bolus – NS 20 ml/kg (if s/s of shock persist) (If more than 3 boluses are needed, contact Medical Control as soon as feasible) Contact Medical Control

PEDIATRIC NAUSEA/VOMITING

Routine EMS Care

- ETT** **Protect and maintain airway**
- Monitor vital signs and LOC**
- Have suction ready**
(for patient who cannot protect their own airway)
- Provide oxygen** per protocol
(blow-by or nasal cannula for nauseated patient)
- EMT-2** **Establish vascular access**
- Administer fluid bolus – NS 20 ml/kg** if patient has
 signs of shock or dehydration, and reassess
- Repeat NS bolus** – if signs of dehydration or shock persist
(If more than 3 boluses are needed, contact Medical Control as soon as feasible)
- Give ondansetron (Zofran) 0.1 mg/kg** (max dose 4 mg) slow IV/IO
(over 2-5 minutes) or IM (repeat once after 10 minutes if nausea/vomiting persists)
- EMT-3** **Provide continuous cardiac monitoring** based on assessment
- Contact Medical Control** if further treatments are to be considered

PEDIATRIC PAIN MANAGEMENT

(For pediatric patients \geq age 6, see Adult Medical Section – Pain Control and Special Circumstances Pain Control)

Contact Medical Control, when feasible, before administering narcotics for pain in children < age 12, except as described in Special Circumstances Pain Control or when needed for emergent sedation for cardioversion/pacing

Note: Consider use of ondansetron (Zofran) to prevent nausea/vomiting when using narcotics for pediatric pain control (See Medication Section – Ondansetron)

PEDIATRIC SEIZURE / STATUS EPILEPTICUS

Initiate treatment based on **history** and **clinical presentation**. It is essential to make the distinction between focal motor seizures, general motor seizures, and status epilepticus.

Routine EMS Care

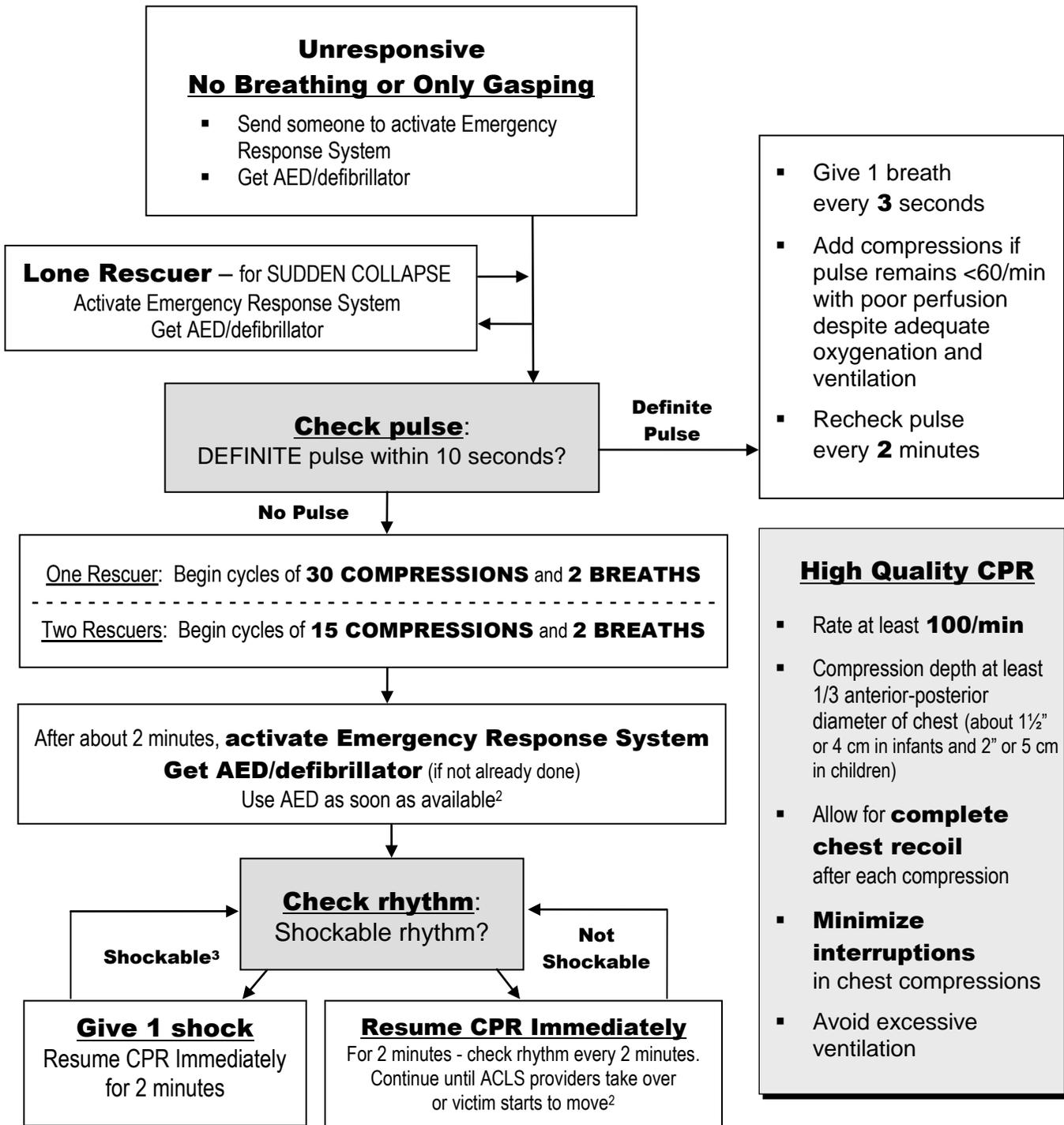
- ETT** **Assess LOC** and **ABCs**
Protect and maintain airway
Closely monitor respiratory status (suction airway as necessary)
Provide blow-by oxygen (assist ventilations via BVM w/100% O₂ as necessary)
Take C-spine precautions – if seizure is secondary to trauma
- EMT-1** **Initiate immediate transport**
Obtain patient history (see appropriate protocols for conditions listed below)
- | | | |
|-------------------------|-------------|-----------------------------|
| ▪ Seizure disorder | ▪ Shock | ▪ Fever |
| ▪ Cardiac dysrhythmias | ▪ Diabetes | ▪ Head trauma |
| ▪ Poisoning or overdose | ▪ Pregnancy | ▪ Respiratory insufficiency |
| ▪ Other | | |
- Consider hypoglycemia** and **check BGL**
- EMT-2** **Establish vascular access** – based on patient condition
- If **BGL <60** give dextrose: Pt ≥ age 2 – **D₅₀ 0.5 g/kg** (1 ml/kg up to 50 ml)
Pt ≥ 1 month to < age 2 – **D₂₅ 0.5 g/kg** (2 ml/kg)
Pt ≥ 1 day to < 1 month – **D₁₀ 0.2 g/kg** (2 ml/kg)
- If **BGL <40** give dextrose: Newborn – **D₁₀ 0.2 g/kg** (2 ml/kg)
- EMT-3** **Provide continuous cardiac monitoring** (treat dysrhythmias per protocol)
If generalized seizure activity continues for more than 10 minutes¹ from onset
consider patient to be in status epilepticus, and proceed as follows:
- Administer diazepam²** for the actively seizing patient:
- Pt ≥ 20 kg (44 lbs) **5 mg** slow IV/IO (repeat after 2 min if seizure continues²)
Pt < 20 kg (44 lbs) **0.2 mg/kg** slow IV/IO (repeat after 2 min if seizure continues²)
- Note:** If unable to establish IV or IO access, give at same dose IM or rectally (PR)
- or-**
- Administer midazolam² 0.2 mg/kg** (5 mg maximum single dose) IN if vascular access not available (repeat after 2 minutes if seizure continues²)
- EMT-3A** **Administer midazolam² 0.2 mg/kg** (5 mg maximum single dose) IV/IO or IN (repeat after 2 minutes if seizure continues²)
- Contact Medical Control** for further interventions³

Note 1: If seizures are brief and self-limiting, withhold benzodiazepines.

Note 2: If the seizure is controlled by administration of diazepam or midazolam, continuous assessment of respiratory status is critical, as respiratory arrest can occur with use of these medications.

Note 3: Contact Medical Control if more than 2 doses of diazepam or midazolam are needed to control seizure. If delay in contacting Medical Control is potentially detrimental to a critical patient, give further weight-based doses at 5-minute intervals as needed. Contact Medical Control as soon as feasible; assess for and treat respiratory depression if high doses are used.

PEDIATRIC BLS ALGORITHM (For Patients after Newly Born¹ to Puberty)



Note 1: For the newborn – See OB/Gyn Section – Newborn Resuscitation Algorithm

Note 2: An AED may be used for an infant or child. If a pediatric attenuator is available, it should be used. If no attenuator is available, an adult AED may be used. When a manual defibrillator and EMT-3/MICP become available, the manual defibrillator should be used rather than the AED.

Note 3: If severe hypothermia (core temperature <86°F) precedes cardiac arrest, perform up to 3 cycles of CPR with appropriate defibrillation. Withhold additional shocks and initiate rewarming with BLS. Additional shocks may be given when the core temperature is ≥86°F or by Medical Control direction.

PEDIATRIC CARDIAC DYSRHYTHMIAS

The EKG of all critically ill or injured children should be continuously monitored.

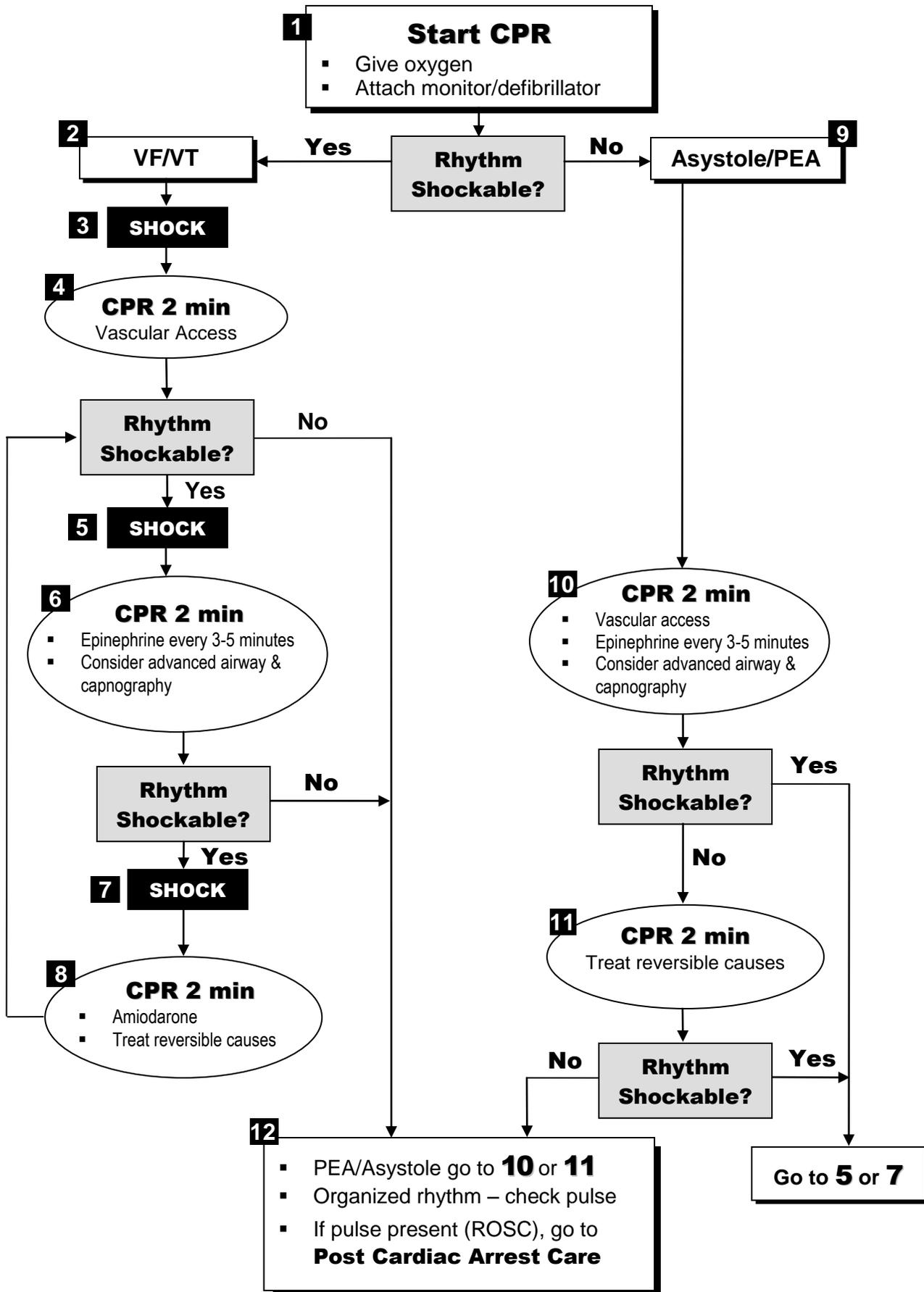
Pediatric dysrhythmias are more frequently the consequences of: hypoxemia, acidosis, decreased cardiac output as a result of respiratory failure, respiratory arrest or hypovolemia.

There are three classifications of dysrhythmias, based on the heart rate and the presence or absence of a pulse. These classifications are bradycardias, tachycardias (with narrow or wide complexes), and pulseless rhythms (PEA, asystole, VF, or pulseless VT).

Continuous cardiac monitoring should also be employed in patients with: decreased level of consciousness, seizures, unstable vital signs, drug ingestions with potential cardiopulmonary effects, chest pain of potential cardiopulmonary origin, hypothermia, shock or any problems with which potential cardiopulmonary instability could be anticipated.

The following pediatric cardiac algorithms are based upon Pediatric Advanced Life Support (PALS) protocols from the American Heart Association.

PEDIATRIC CARDIAC ARREST ALGORITHM



PEDIATRIC CARDIAC ARREST ALGORITHM – NOTES

CPR Quality:

- Push hard ($\geq 1/3$ of anterior-posterior diameter of chest), and fast (at least 100/minute), and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressors every 2 minutes
- If no advanced airway – 15:2 compression to ventilation ratio (30:2 for single rescuer)
- If advanced airway in place – give 1 breath every 6-8 seconds (8-10 breaths/minute) with continuous chest compressions
- Defibrillate when indicated – do not delay defibrillation for adjunct therapies
- Monitor EtCO₂ – if reading falls below 10 mmHg, attempt to improve quality of CPR

Return of Spontaneous Circulation (ROSC):

- Observe presence of pulse and blood pressure
- Ventilations for patients with pulses – give 1 breath every 3-5 seconds (12-20 breaths/minute)
- Note abrupt increase in EtCO₂ (typically ≥ 40 mmHg)

Shock Energy for Defibrillation:

- First shock – **2 J/kg**
- Second shock – **4 J/kg**
- Subsequent shocks ≥ 4 J/kg (maximum 10 J/kg or adult dose)

Drug Therapy (for pulseless patients):

(EMT-3)

- Epinephrine IV/IO dose – **0.01 mg/kg** (0.1 ml/kg 1:10,000) bolus every 3-5 minutes
- Epinephrine ET dose – **0.1 mg/kg** (0.1 ml/kg 1:1000) every 3-5 minutes
- Amiodarone IV/IO dose – **5 mg/kg** bolus may repeat twice (for refractory VF / pulseless VT)
- Lidocaine IV/IO dose – **1 mg/kg** bolus may repeat after 5-10 minutes to maximum 3 mg/kg (for VF / pulseless VT if contraindications to amiodarone are present)
- Lidocaine ET dose – **2 to 3 mg/kg** (for VF / pulseless VT if vascular access not obtainable, max 3mg/kg)

(EMT-3A)

- Magnesium sulfate IV/IO slow push (while pulseless) **25 to 50 mg/kg** (max dose 2 g) for Torsades de Pointes

Note: Additional information on medications, including contraindications can be found in the medication section.

Advanced Airway:

- Advanced airway placement should be deferred during initial phases of resuscitation if BVM ventilations are effective
- Utilize capnography to confirm and monitor ET tube placement
- Ventilate at 1 breath every 6-8 seconds (8-10 breaths/minute) with continuous chest compressions while pulseless (or HR <60) and 1 breath every 3-5 seconds (12-20 breaths/minute) with pulse >60

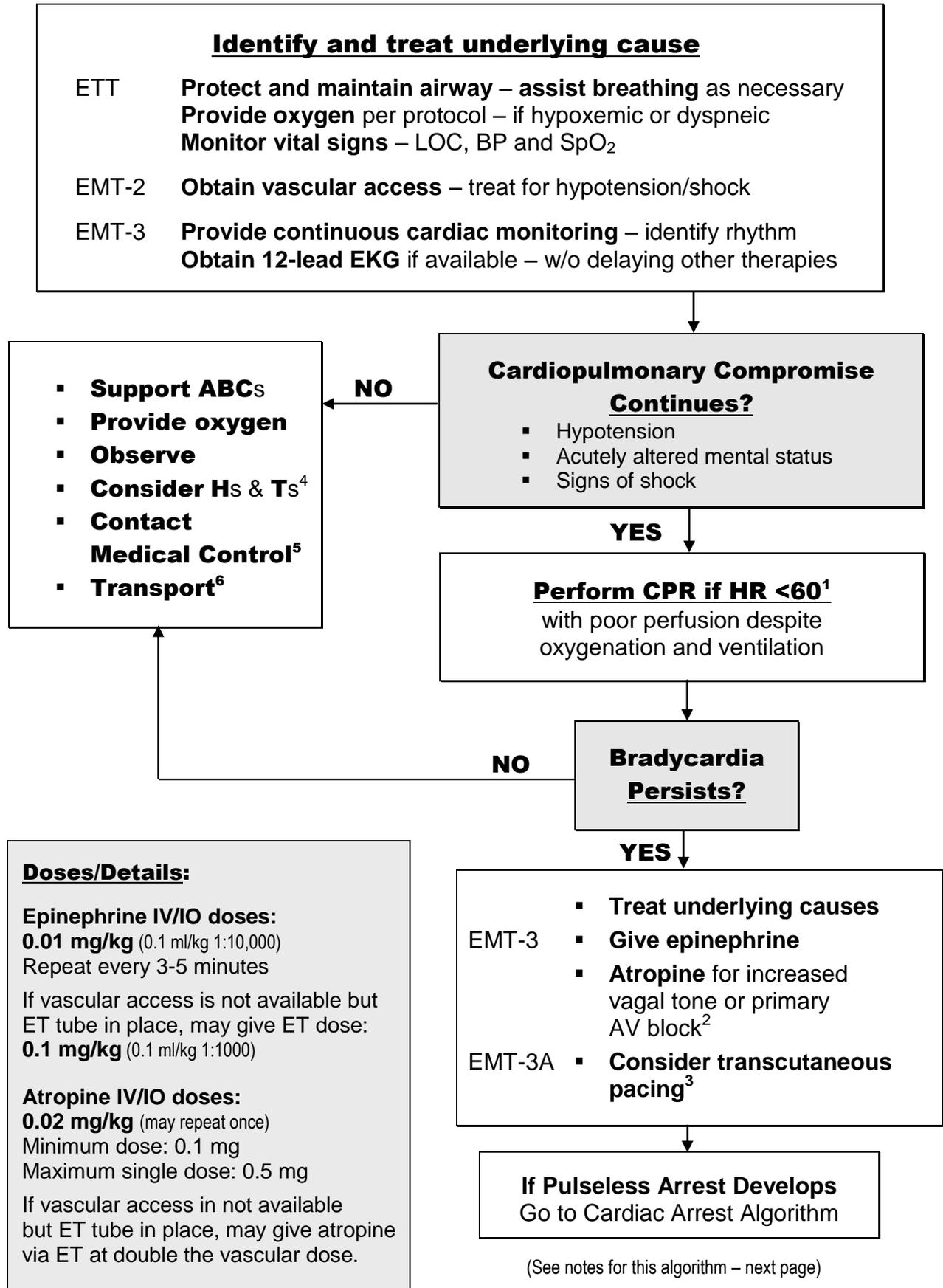
Reversible Causes

(6 Hs & Ts)

- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ Hypoxia ▪ Hypovolemia ▪ Hypo/hyperkalemia ▪ Hypothermia ▪ Hydrogen ions (acidosis) ▪ Hypoglycemia | <ul style="list-style-type: none"> ▪ Toxicity (drug overdose) ▪ Tension pneumothorax ▪ Tamponade (cardiac) ▪ Thrombus (cardiac/AMI) ▪ Thrombus (pulmonary/PE) ▪ Trauma |
|--|--|

Provide intervention(s) appropriate to suspected cause of arrest

PEDIATRIC BRADYCARDIA ALGORITHM (Patient with Pulse and Poor Perfusion)



PEDIATRIC BRADYCARDIA ALGORITHM – NOTES

(Patient with Pulse and Poor Perfusion)

- Note 1:** After 2 minutes of CPR, reassess for heart rate and signs of poor perfusion. If bradycardia and poor perfusion persist, continue 2-minute cycles of CPR and reassessment.
- Note 2:** If bradycardia is due to hypoxia or respiratory insufficiency, atropine is NOT indicated.
- Note 3:** (EMT-3A/MICP) Contact Medical Control prior to initiating transcutaneous pacing, if feasible. Set rate to 100 for pre-pubescent patients, unless other rate is directed by Medical Control.
- Note 4:** Search for and treat reversible causes of bradycardia with poor perfusion.

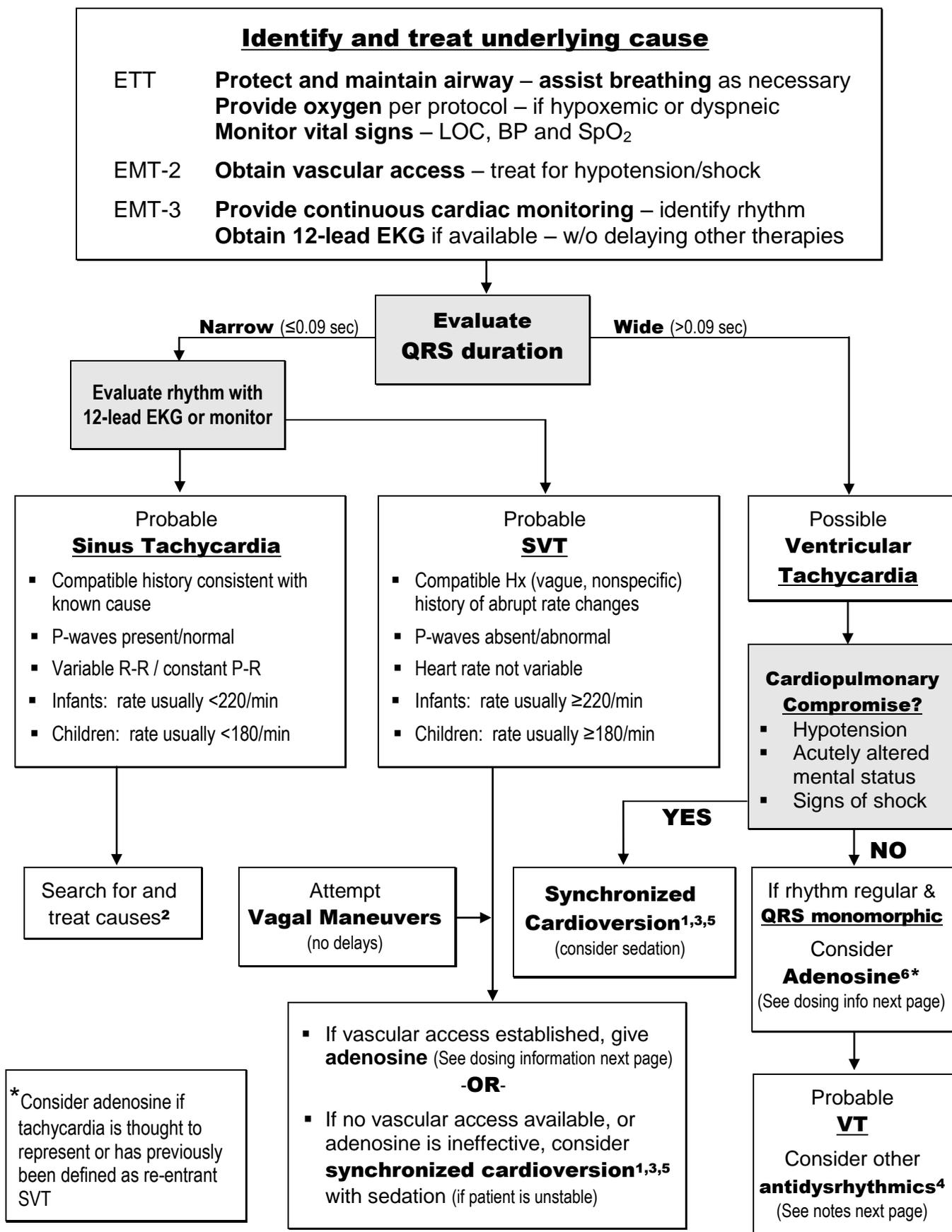
6 Hs & Ts

- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ Hypoxia ▪ Hypovolemia ▪ Hypo/hyperkalemia ▪ Hypothermia ▪ Hydrogen ions (acidosis) ▪ Hypoglycemia | <ul style="list-style-type: none"> ▪ Toxicity (drug overdose) ▪ Tension pneumothorax ▪ Tamponade (cardiac) ▪ Thrombus (cardiac/AMI) ▪ Thrombus (pulmonary/PE) ▪ Trauma |
|--|--|

Provide intervention(s) appropriate to suspected cause

- Note 5:** Contact Medical Control as soon as feasible.
- Note 6:** Transport as soon as feasible – delays in transport are acceptable if needed to initiate appropriate BLS/ACLS interventions.
- Note:** If severe hypothermia (core temperature <86°F) precedes bradycardia, withhold medications until rewarming has raised core temperature to ≥86°F.

PEDIATRIC TACHYCARDIA (Patient with Pulse and Poor Perfusion)



* Consider adenosine if tachycardia is thought to represent or has previously been defined as re-entrant SVT

PEDIATRIC TACHYCARDIA – NOTES (Patient with Pulse and Poor Perfusion)

Note 1: Consult Medical Control as soon as feasible.

This is especially important when:

- Etiology of the rhythm is unclear
- Cardioversion is being considered
- Antidysrhythmics are being administered

Note 2: Causes of sinus tachycardia include: fever, hypoxia, respiratory distress, pain, hypovolemia, shock, poisoning, etc.

Note 3: When considering cardioversion (EMT-3A) contact Medical Control, if feasible

- Cardioversion should ONLY be used to treat patients with clear evidence of instability that is caused by the elevated heart rate.
- Cardioversion is usually **not** indicated for heart rates <150 bpm.
- Cardioversion is **not** indicated for sinus tachycardia, junctional tachycardia, multifocal atrial tachycardia, and ectopic atrial tachycardia (many drug/toxin-induced tachycardias will not respond to cardioversion).
- Cardioversion of atrial fibrillation can result in embolic complications such as stroke.
- Some **chronic tachycardias** may not respond to cardioversion.
- Some patients whose stability is borderline, may be treated with a trial of antidysrhythmics.

Cardioversion energy settings:

- **1st** attempt – **0.5 to 1 J/kg**
- Subsequent – **2 J/kg**

Sedation for cardioversion:

- **Fentanyl** – 2 mcg/kg slow IV/IO or IN
- or-
- **Midazolam** – 0.2 mg/kg (up to 2 mg maximum dose) slow IV/IO or IN

Note 4: Antidysrhythmic Dosing & Details (See Medication Section for further info & contraindications):

Adenosine – for probable SVT (EMT-3A)

- **1st** dose – **0.1 mg/kg** (maximum 6 mg) rapid IV/IO push
- **2nd & 3rd** doses – **0.2 mg/kg** (maximum 12 mg each) rapid IV/IO push

Lidocaine – for probable VT (EMT-3)

- **1 mg/kg** slow IV/IO push (may repeat same dose in 15 minutes if VT continues)

Amiodarone – for probable VT (MICP)

- **5 mg/kg** (maximum 1st dose 150 mg) IV/IO over 20-60 minutes

Magnesium sulfate – for probable Torsades de Pointes (EMT-3A)

- **25-50 mg/kg** (maximum dose 2 g) IV/IO over 10-20 minutes

Note 5: EMT-3A / MICP only

Note 6: MICP only For use of adenosine in wide-complex tachydysrhythmias, obtain consultation with Medical Control. Adenosine may be authorized by Medical Control for wide-complex tachydysrhythmias that are regular, monomorphic and clinically compatible with SVT with aberrancy. Some patients with wide-complex tachydysrhythmias can decompensate with adenosine, so the administration of electrical therapy must immediately available.

PEDIATRIC POST-RESUSCITATION CARE

Return of Spontaneous Circulation (ROSC)
 Contact Medical Control and post-resuscitative care resources ASAP



Optimize Ventilation and Oxygenation

- Maintain oxygen saturation at 94% to 99%
- Consider advanced airway and capnography
- Do not hyperventilate



Assess & Treat Persistent Shock

- Administer IV/IO fluid bolus – obtain 2nd vascular access site
- Consider reversible causes
- Obtain 12-lead EKG (notify receiving hospital ASAP if STEMI or presumably new LBBB is identified¹)
- Treat dysrhythmias – using appropriate protocols
- (MICP only) Consult Medical Control for possible epinephrine drip for cardiogenic shock not responsive to IV fluid resuscitation (See Medication Section – Epinephrine 1:10,000)



Does Patient Follow Commands?

NO

Consider Induced Hypothermia
 (See Pediatric Post-Cardiac Arrest Therapeutic Hypothermia Protocol – next page)

YES

Transport
 Contact Medical Control
 As soon as feasible

NOTES:

Ventilation/Oxygenation:

- Avoid excessive ventilation
- 1 breath every 3-5 seconds with ROSC
- Titrate rate to EtCO₂ of 35-40 mmHg

IV fluid bolus:

- 5-20 ml/kg NS boluses (if needed for shock)

Reversible Causes (6 Hs & Ts)

Hypoxia	Toxins
Hypovolemia	Tension pneumothorax
Hydrogen Ions (acidosis)	Tamponade (cardiac)
Hypo/hyperkalemia	Thrombus (cardiac)
Hypothermia	Thrombus (pulmonary)
Hypoglycemia	Trauma

Note 1: All post-arrest patients with STEMI, presumed new LBBB or strong suspicion of acute MI (due to coronary artery occlusion) should be transported to a receiving hospital capable of immediate PCI, if feasible.

Patients in recurrent arrest should be taken to the closest hospital.

Consider aeromedical transport when it allows arrival to appropriate hospital significantly faster than ground transport.

Ground transport patients should be taken to MSRMC unless Medical Control orders alternate destination.

PEDIATRIC POST-CARDIAC ARREST THERAPEUTIC HYPOTHERMIA

Inclusion Criteria: Patient with ROSC following cardiac arrest who do not have a meaningful response to verbal stimuli (follow commands) **and**
Post-arrest temperature must be >94°F

Exclusion Criteria (unless otherwise ordered by Medical Control):
Patient known to be pregnant
Trauma patients or those with known active bleeding
Patients who have had major surgery within last 14 days
Patients with suspected sepsis
Patients in shock
Patient is unable to follow commands for reasons other than cardiac arrest (i.e. drug intoxication, prolonged seizure)

Note: Contact Medical control for clarification and to discuss management, as some of these patients could benefit from post-resuscitative hypothermia, despite these relative contraindications.

Special

Circumstances: For patients with ROSC when hypothermia preceded cardiac arrest, who are unable to follow commands, rewarm core to target temperature of 90-94°F. Contact Medical Control if baseline rectal temperature is <94°F, to discuss management options.

Procedure:

EMT-1

- Obtain baseline GCS (verify patient cannot follow commands or does not respond to verbal stimuli)
- Assess VS – assess for shock
- Assess rectal temperature (ensure baseline >94°F)
- Apply ice packs wrapped in towels to axillae, groin & neck (reposition every 10-15 min. & replace as needed)

EMT-3

- Infuse 30 ml/kg (up to 2 L maximum) of chilled (4°C) NS over 20 minutes
- Provide continuous cardiac monitoring while administering chilled saline (discontinue infusion if hemodynamically significant dysrhythmias develop)
- Monitor VS, oxygenation, cardiac rhythm and provide supportive care
- Monitor rectal temperature every 30 minutes and discontinue cooling measures for rectal temperature <90°F
- Consider anti-shivering agents if shivering occurs and the patient has an advanced airway, vascular access site, EKG monitor and SBP >100 mmHg. Anti-shivering agents include **one** of the following:
 - **Fentanyl – 1 mcg/kg** slow IV/IO (may repeat once in 5 minutes at same dose if shivering continues and SBP >100 mmHg – contact Medical Control if additional is needed)
 - **Diazepam – 0.2 mg/kg** (maximum single dose 5 mg) slow IV/IO (may repeat once in 5 minutes at same dose if shivering continues and SBP >100 mmHg – contact Medical Control if additional is needed)

EMT-3A – may use midazolam as an alternative anti-shivering agent

- **Midazolam – 0.05 mg/kg** (maximum single dose 2.5 mg) slow IV/IO (may repeat once in 5 minutes at same dose if shivering continues and SBP >100 mmHg – contact Medical Control if additional is needed)

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MAT-SU BOROUGH EMS



Section 7

PEDIATRIC TRAUMA Protocols

Multisystem Trauma Management – Pediatric	7-2 to 7-7
Pediatric Burn Injuries	7-8
Pediatric Spinal Cord Injury	7-9
Pediatric Pain Management	7-9
Pediatric Traumatic Shock	7-10

MULTISYSTEM TRAUMA MANAGEMENT - PEDIATRIC

INITIAL ASSESSMENT

AIRWAY

- ETT **Provide Airway and C-Spine Control**
- Maintain in-line C-spine immobilization
 - Provide manual airway control via:
 - Head-tilt / chin lift
(spinal injury not suspected)
 - Jaw thrust
(spinal injury is suspected)
 - Suction airway as needed
- EMT-2 **Provide Advanced Airway Control**
- King Airway
(See Appendix – King Airway)
- EMT-3A **Perform ET Intubation** if indicated

Note: Hypoxia is common in the trauma patient, and correcting it is a high priority. Spinal injury may be present, and the airway should be managed as if C-spine instability exists. However, concern for a spinal injury **MUST NOT DELAY** adequate ventilation and oxygenation.

Maintain the neck in a neutral position. If advanced airway placement is needed, manual stabilization of the spine must be maintained throughout the insertion, so that the mandible and tongue are moved forward and the head is **NOT tilted** backwards.

BREATHING

- ETT **Provide Breathing Support** (See Pediatric Medical Section – Emergency Reference Chart)
- Assist ventilations if there is inadequate respiratory effort via:
 - Mouth-to-pocket-mask – with 100% supplemental oxygen
 - Bag-valve-mask – with 100% supplemental oxygen (1 breath every 3-5 seconds)
 - BLS intervention for breathing-related life threats such as:
 - Flail chest – stabilize flail section
 - Open pneumothorax / sucking chest wound – 3 sided occlusive dressing
- Provide Supplemental Oxygen** to all patients with abnormal vital signs, decreased LOC, or potentially life/limb-threatening injuries
- EMT-3A **Provide Advanced Level Intervention**
- Address breathing-related life threats such as:
 - Tension pneumothorax (See Appendix – Needle Chest Decompression)

CIRCULATION AND BLEEDING CONTROL

- ETT **Evaluate pulse** (rate/strength/character) – **perform CPR** if indicated (See Cardiac – BLS algorithm)
- Evaluate skin** condition¹ (temperature/color/moisture) and capillary refill (should be <2 seconds)
- Manage for shock** as indicated
- Provide Hemorrhage Control**² via:
- Direct pressure on bleeding wounds (with sterile gauze)
 - Tourniquet (indicated only if bleeding cannot be controlled by less invasive methods)
- Note:** If tourniquet is applied, advise Medical Control **ASAP!**
- Traction splint (may decrease life-threatening blood loss from femur fracture)
 - Pelvic sling / M.A.S.T.³ (for unstable pelvic fracture with hypotension)
(See Appendix – M.A.S.T. pants)
- EMT-3 **Provide Continuous Cardiac Monitoring** for all patients with abnormal vital signs, decreased LOC or potentially life/limb-threatening injuries (do not delay transport for EKG monitoring)

Note 1: Pale and/or moist skin with rapid pulse is an accurate indicator of inadequate tissue perfusion/shock. Blood pressure is obtained later in the patient assessment. Capillary refill > 2 seconds indicates inadequate perfusion.

Note 2: Hemorrhage control in the initial assessment is used only for massive bleeding. Minor bleeding takes a lesser priority. For pts with unstable femur fractures, application of a traction splint is the most important field technique for associated hemorrhage

Note 3: Patients with “open book” pelvic fractures may benefit from stabilization and direct pressure applied by the pelvic sling / M.A.S.T. (use appropriate size equipment); however, application of these devices should not delay rapid transport.

MULTISYSTEM TRAUMA MANAGEMENT - PEDIATRIC (cont'd)

INITIAL ASSESSMENT (continued)

EVALUATE LEVEL OF CONSCIOUSNESS

- ETT Assess patient LOC via:
- Glasgow Coma Scale
 - AVPU Scale
- A** – Patient alert
V – Patient responds to voice
P – Patient responds to pain
U – Patient unresponsive

Exposing the Body for Examination:

It may be necessary to expose the body partly or completely to control bleeding and perform lifesaving procedures. Though it is important to consider modesty and to respect each individual's needs, do not delay assessment, treatment, and transport of the critically injured patient, for the sake of modesty.

Pediatric Glasgow Coma Scale

	CHILD	INFANT
EYE OPENING	4 – Spontaneous	4 – Spontaneous
	3 – To Speech	3 – To Speech
	2 – To Pain	2 – To Pain
	1 – No Response	1 – No Response
VERBAL RESPONSE	5 – Oriented	5 – Coos and Babbles
	4 – Confused Conversation	4 – Irritable Cry
	3 – Inappropriate Words	3 – Cries in Pain
	2 – Incoherent Sounds	2 – Moans in Pain
	1 – No Response	1 – No Response
MOTOR RESPONSE	6 – Obeys Commands	6 – Spontaneous Movement
	5 – Localizes Pain	5 – Withdraws to Touch
	4 – Withdraws from Pain	4 – Withdraws from Pain
	3 – Flexion (Pain)	3 – Flexion (Pain)
	2 – Extension (Pain)	2 – Extension (Pain)
	1 – No Response	1 – No Response

RESUSCITATION

ETT **Open and maintain the airway – provide oxygen per protocol** for all multi-system trauma patients

Monitor blood pressure – evaluate capillary refill time

EMT-2 **Obtain vascular access – NS** for fluid replacement

- Pediatric fluid bolus – 20 ml/kg (followed by reassessment)
Repeat bolus if shock continues
(If more than 2 boluses needed, contact Medical Control as soon as feasible)
- Use Broselow Tape to estimate patient weight and drug dosages

Note: Excessive time must not be spent in the field for multiple vascular access attempts! Initiate transport of critically injured patients ASAP! Obtain vascular access en route to the hospital. Transport of critically injured patients should be started as rapidly as possible (<10 minutes).

EMT-3 **Initiate continuous cardiac monitoring** during transport of any trauma patient who has unstable VS, decreased LOC, major chest injury or suspected internal injury/hemorrhage

MULTISYSTEM TRAUMA MANAGEMENT - PEDIATRIC (cont'd)

RAPID TRAUMA ASSESSMENT

ETT

Evaluate the Head

Reassess airway for patency – correct any problems

Look for open wounds:

- Control hemorrhage with direct pressure¹
- Apply clean dressings to all wounds

Evaluate the eyes:

- Protect from further injury
- Irrigate/remove contaminants and debris
- Do not attempt to remove foreign bodies

Inspect nose and ears:

- Look for fluid (blood, CSF)

Evaluate the Neck

Provide spinal immobilization² – spinal injury must be initially assumed in all pediatric patients with a significant MOI. In all patients for whom age or condition could interfere with communication required for selective spinal immobilization, have a higher index of suspicion for injury. If in doubt, err on the side of immobilization.

With significant MOI, immobilize the spine if any of the items below are exhibited:

- Unconscious patient / Decreasing LOC
- Multiple trauma / Distracting injuries
- Neck pain or tenderness
- Complaints of extremity numbness/tingling
- Inability to communicate effectively
- Discomfort or stiffness with spinal motion

Inspect for neck wounds³

- Leave foreign bodies in place and stabilize
- Use direct pressure to control hemorrhage
- Avoid additional wound contamination
- Cover as feasible with sterile dressings

Note: Perform systematic trauma patient evaluations, beginning at the head and proceeding to the neck, thorax, abdomen, and extremities

Do not waste time to perform unnecessary diagnostic procedures that do not produce information directly related to important pre-hospital treatment

Quickly identify critical patients who require rapid transport. Stabilize and transport these patients to an appropriate facility immediately!

NEVER secure a patient to the backboard by their head alone, as any unexpected movement could cause severe trauma/damage to the C-spine.

Do not delay transport: most injuries to the face and head require hospital treatment. In most cases delay for any reason other than hemorrhage control and airway management is usually not appropriate.

Note 1: Lacerations of the scalp may have a fracture beneath; use only enough pressure to control hemorrhage.

Note 2: For small children, an appropriate size collar may not be available. In the event that available collars are too large, maintain C-spine immobilization with an appropriate pediatric immobilization board, and head immobilizers. An appropriately padded KED may be employed, according to PEPP guidelines.

Note 3: Neck wounds should not be probed. Frequently a clot forms in the carotid artery or jugular vein, which could be dislodged by probing, and cause severe hemorrhage. Compression dressing should not be circumferential or tight enough to restrict blood flow to or from the brain.

MULTISYSTEM TRAUMA MANAGEMENT - PEDIATRIC (cont'd)

RAPID TRAUMA ASSESSMENT (continued)

ETT Evaluate the Thorax

Reassess ventilations – verify adequacy

Support ventilation/oxygenation as necessary

Re-evaluate injuries and BLS interventions

Chest wall injuries:

- Simple rib fractures (no intervention needed)
- Flail chest (stabilize flail segment / support ventilations)
- Open pneumothorax (re-evaluate interventions)

EMT-2 Reassess previous interventions for:
Pericardial tamponade, hemothorax
or simple pneumothorax

- Consider advanced airway
(See Appendix – King Airway)
- Establish vascular access – fluid per protocol
(See Pediatric Traumatic Shock – this section)

EMT-3 Reassess previous advanced interventions for:
Myocardial contusion

- Provide continuous cardiac monitoring
- Treat dysrhythmias per PALS protocols

EMT-3A Tension pneumothorax

- Re-evaluate previous interventions

ETT Evaluate the Abdomen

Evisceration

- Apply moist, sterile dressing
- Cover with occlusive dressing
(such as large plastic bag or sheet)
- Keep abdomen warm

Foreign body / impalement

- Stabilize foreign body to prevent
further injury during transport
- Do not remove except by direct
Medical Control order

Pelvic fracture

- Long backboard immobilization, application of sheet-wrap or pelvic sling
- Consider M.A.S.T. stabilization (verify appropriate size)

Abdominal hemorrhage

- Control external bleeding with direct pressure
(direct pressure will not control internal bleeding)
- Consider M.A.S.T. application (M.A.S.T. should not delay transport)

EMT-2 Address internal hemorrhage

- Establish vascular access (See Pediatric Traumatic Shock – this section)
Hemorrhagic shock is treated with NS boluses at 20 ml/kg followed by reassessment
(If more than 2 boluses needed, contact Medical Control as soon as feasible)

Important!

With the exception of myocardial contusion and pericardial tamponade, most of the chest injuries that result from trauma are either managed when identified during the initial assessment or at the hospital.

Chest injuries are the second leading cause of death and disability in trauma patients.

These patients need to have a **high transport priority** as part of their treatment plan.

Note: Signs and symptoms of intra-abdominal injuries are often delayed. Serial reassessment of patients with abdominal trauma is indicated.

However, prolonged evaluation of the abdomen by checking for guarding, rebound tenderness or bowel sounds can result in needless delay, as well as patient discomfort.

Most patients with intra-abdominal injuries require prompt evaluation in the hospital; therefore,

Transport Without Delay

Notify Receiving Facility ASAP!

MULTISYSTEM TRAUMA MANAGEMENT - PEDIATRIC (cont'd)

RAPID TRAUMA ASSESSMENT (continued)

ETT Evaluate for Neurological Trauma – TBI, Spinal Cord or Peripheral Nerve Damage

Suspect associated C-spine injury and treat accordingly

For any patient with a reduced LOC:

- Continually reassess airway patency
- Be prepared to assist ventilations (use airway adjuncts as needed)

Evaluate/record GCS every 10 minutes or more frequently

Evaluate pupils for:

- Size
 - Equality
 - Reactivity
- (reassess pupils every 10 minutes if GCS <13)

Reassess CSM function at least every 10 minutes

Provide oxygen per protocol for suspected TBI patients – maintain SpO₂ ≥ 90%

Assist ventilations at appropriate pediatric rate:

- Pediatric (age 1 to 8) – one breath every 3-5 seconds (12-20 breaths/minute)
- Infants (less than 1 year) – one breath every 3 seconds (20 breaths/minute)

Hyperventilate the suspected TBI patient if there are:

1.) Pupillary changes (unequal pupils OR fixed, dilated pupils)

AND

2.) GCS of 3 or 4 (no response to pain OR decerebrate posturing)

Hyperventilation rates are as follows:

- Pediatric (age 1 to 8) – 1 breath every 2.5 to 3 seconds (20-24 breaths/minute)
- Infant (age <1 year) – 1 breath every 2 to 2.5 seconds (24-30 breaths/minute)

EMT-2 Titrate fluids to prevent hypotension and treat shock
(See Pediatric Traumatic Shock – this section)

If signs of shock are present, look for other causes of blood loss, as brain injury alone rarely causes hypotension

EMT-3 If GCS is <9 consider advanced airway and BVM, to manage airway and oxygenation

EMT-3A If capnography is used, titrate ventilation rate to EtCO₂ of 35-40 mmHg
Note: during hyperventilation for head injury EtCO₂ target should be 30 mmHg (avoid EtCO₂ <30 mmHg)

ETT Care for Wounds

Cover open wounds and avoid additional contamination

Foreign body / impalement

- Do Not Remove – except by Medical Control direction
- Stabilize foreign body to prevent further injury during transport

MULTISYSTEM TRAUMA MANAGEMENT - PEDIATRIC (cont'd)

RAPID TRAUMA ASSESSMENT (continued)

ETT **Evaluate Extremities**

- Examine for swelling and deformity
- Assess for neurovascular function (**C**irculation, **S**ensation, **M**otor function)
- Apply direct pressure to control bleeding
- Splint as needed (re-assess neurovascular status after splinting)
- Check for and remove any circumferential jewelry in region of trauma that could lead to vascular compromise (transport jewelry with patient)

FURTHER ASSESSMENT

ETT Assess trauma patients for the possibility of associated toxic, metabolic, and underlying health problems (hypoglycemia, drug ingestion, cardiac condition, etc.) and treat per specific protocols.

Note: Do not administer dextrose with BGL >60

TRANSPORTATION

ETT It is often impossible to fully stabilize trauma patients in the pre-hospital setting

Balance lifesaving interventions (such as airway management and spinal immobilization) with minimizing scene time (less than 10 minutes) and rapid transport to reduce the time from injury to definitive surgical treatment.

Early notification of the receiving hospital is essential to ensure the immediate availability of appropriate in-hospital response.

PEDIATRIC BURN INJURIES

The approach to the pediatric burn patient should be similar to your approach for any burn patient. The following protocol will deal with specific fluid resuscitation measures, and special considerations for the pediatric burn patient. Remember to assess for associated trauma or toxic/metabolic problems.

Provide oxygen, IV, and continuous cardiac monitoring for patients with: large burns (>9%), abnormal vital signs, decreased LOC, suspected inhalation injuries or toxic exposures (such as carbon monoxide).

Routine EMS Care

ETT	<p>Ensure scene safety for you and the patient</p> <p>STOP THE BURNING PROCESS! (remove circumferential jewelry near burn)</p> <p>If skin is still hot – apply water or NS for up to 2 minutes (if TBSA ≤9%)</p> <p>Protect and maintain airway</p> <p>Provide oxygen per protocol – support ventilations as needed</p>
EMT-2	<p>Establish vascular access – give 20 ml/kg NS if burn TBSA >9% or evidence of shock is identified (reassess and repeat bolus if evidence of shock continues)</p>
EMT-3	<p>Provide continuous cardiac monitoring</p> <p>Contact Medical Control for the following (alternate dosing may be recommended)</p> <p>Morphine – 0.1 mg/kg slow IV/IO (for pain management – maximum single dose 4 mg)</p> <p>Fentanyl – 1 to 2 mcg/kg slow IV/IO or IN (for pain management)</p> <p>Diazepam – 0.2 mg/kg slow IV/IO (for anxiety – maximum single dose 5 mg)</p> <p>Midazolam – 0.2 mg/kg IN (for anxiety – maximum single dose 3 mg)</p> <p>Note 1: EMT-3A may also give midazolam slow IV/IO</p> <p>Note 2: See Pediatric Pain Management – next page</p> <p style="padding-left: 40px;">Monitor patient closely for CNS depression during narcotic or benzodiazepine administration – be prepared to support ventilations via BVM</p> <p>Additional fluid replacement – if more than 3 boluses are needed, contact Medical Control as soon as feasible. (See Pediatric Traumatic Shock – this section)</p>

Note: Special consideration – the anatomical map of the pediatric patient changes with age. If in doubt as to the TBSA involved in the burn, use the “Rule of Nines” (See Appendix – Pediatric Rule of Nines). Another method to estimate percentage of body surface area affected by smaller burns is to consider the area of the patient’s palm (excluding fingers) as 1%. Then, estimate number of “palm prints” the burn(s) would cover.

Be suspicious of burn patterns that may indicate child abuse:
i.e. **“stocking”** or **“glove” pattern burns**

Ophthalmic Chemical Burns:

Care must be taken to prevent any child who has an ophthalmic burn from rubbing the eye, as additional injury may occur. Standard treatment for chemical ophthalmic burns is continuous flushing with normal saline for the duration of transport, until definitive care can be obtained at the receiving facility.

PEDIATRIC SPINAL CORD INJURY

Routine EMS Care

- ETT** **Assess neurological status** – determine **LOC**, and **CSM** in extremities
Prioritize patient packaging with proper **spinal immobilization**:
- Properly sized C-collar or other C-spine stabilization
 - Immobilization on backboard or pediatric backboard
 - Maintain spine in neutral in-line position at all times
- Protect and maintain airway** aggressively as needed:
- Prepare for **ventilatory** support – BVM with OPA or NPA
 - Provide **oxygen per protocol** – to prevent hypoxemia
- Reassess neurological status** – LOC, and CSM in all extremities
Monitor vital signs
TRANSPORT WITHOUT DELAY (goal: on-scene time <10 minutes)
- EMT-2** **King Airway** – as indicated for critical patient
Obtain vascular access – if patient is hypotensive/tachycardic give **NS fluid bolus – 20 ml/kg** (reassess and repeat bolus if evidence of shock continues)
- EMT-3** **Provide continuous cardiac monitoring** for critical patients
Contact Medical Control for the following (alternate dosing may be recommended)
- Morphine – 0.1 mg/kg** slow IV/IO (for pain management – maximum single dose 4 mg)
Fentanyl – 1 to 2 mcg/kg slow IV/IO or IN (for pain management)
- Notes:** See Pediatric Pain Management – below
Monitor patient closely for CNS depression during narcotic administration – be prepared to support ventilations via BVM
- Additional fluid replacement** – if shock continues after 40 ml/kg total
(See Pediatric Traumatic Shock – this section)

Note: (See Adult Trauma Section – Selective Spinal Immobilization) Selective spinal immobilization of pediatric patients is often complicated by their age. For patients whose age or chronic medical condition could interfere with communication or perception of pain, consider spinal immobilization even with less clear signs and symptoms and lesser mechanism of injury. When in doubt choose immobilization.

PEDIATRIC PAIN MANAGEMENT

(For pediatric patients ≥age 6, see Adult Medical Section – Pain Control and Special Circumstances Pain Control)

Contact Medical Control, when feasible, before administering narcotics for pain in children < age 12, except as described in Special Circumstances Pain Control or when needed for emergent sedation for cardioversion/pacing

Note: Consider use of ondansetron (Zofran) to prevent nausea/vomiting when using narcotics for pediatric pain control (See Medication Section – Ondansetron)

PEDIATRIC TRAUMATIC SHOCK

For patients < age 12 or <50 kg (110 lbs)

TREATMENT

Routine EMS Care

- | | |
|-------|--|
| ETT | <p>Assess ABCs
 Protect and maintain airway – support ventilations at all times
 Address obvious life threats
 Provide oxygen per protocol
 Assess – LOC, VS and lung sounds continuously</p> |
| EMT-1 | Transport – notify receiving facility ASAP |
| EMT-2 | Establish vascular access – NS |
| EMT-3 | Provide continuous cardiac monitoring |

HYPOVOLEMIC¹

- | | |
|-------|--|
| ETT | <p>Control bleeding / volume loss
 Consider pelvic sling / M.A.S.T.
 for possible pelvic instability</p> |
| EMT-2 | <p>Consider 2nd large-bore vascular access site
 Give IV fluid bolus 20 ml/kg³
 (repeat as needed)</p> |

OBSTRUCTIVE¹

- | | |
|--------|---|
| EMT-2 | <p>For suspected pericardial tamponade – give IV fluid bolus 20 ml/kg (repeat as needed)</p> |
| EMT-3A | <p>For suspected tension pneumothorax – perform decompression
 (See Appendix – Needle Chest Decompression)</p> |

NEUROGENIC¹

- | | |
|-------|---|
| ETT | <p>Maintain spinal immobilization
 (required for suspected neurogenic shock)</p> |
| EMT-2 | <p>Give fluid bolus – 10-20 ml/kg
 (reassess & repeat if shock continues²)
 Consider 2nd vascular access site</p> |
| EMT-3 | <p>Contact Medical Control
 (for possible use of atropine if refractory shock and bradycardia are present)</p> |

Note 1: Traumatic shock may have multiple simultaneous causes.

Note 2: EMT-2 thru MICP contact Medical control if evidence of shock continues after 2 boluses of IV fluid have been administered before additional boluses are given.

Neurogenic shock patients are prone to fluid overload from overzealous IV fluid resuscitation.

Adequate perfusion is sometimes present before normalizing blood pressure

Note 3: Consult Medical Control as soon as feasible if more than 2 boluses of NS are felt necessary for uncontrolled hemorrhage. Excessive fluid administration in this setting can be detrimental. For burns or hypovolemic states where there is no suspicion of uncontrolled hemorrhage, 3 boluses may be administered prior to Medical Control consult.

MAT-SU BOROUGH EMS



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INTERVENING PROVIDER PROTOCOL

MSB EMS PROVIDER ACTIONS

When an individual at a MSB EMS response identifies himself or herself as a medical provider who is not affiliated with the MSB EMS and offers assistance, **EMS providers** are to thank the **Intervening Provider**, and inform him or her that:

- 1) The offer must be authorized by the EMS Medical Control physician
- 2) Continued assistance by the Intervening Provider will require that the Intervening Provider's identification information and actions be documented in the Patient Care Report (PCR)

If the Intervening Provider wishes to proceed, the **EMS providers** must, as soon as feasible:

- 1) **Ask to see documentation** that verifies the Intervening Provider's credentials and contact information, unless these are already known to the EMS provider.
- 2) Contact Medical Control and **speak with the Medical Control physician**:
 - Provide a verbal report to the Medical Control physician, including any known documentation or information concerning the Intervening Provider's credentials.
 - Briefly describe available resources and the patient's condition.
 - Inform the Medical Control physician that you will need to speak to him or her again after the Medical Control physician instructs the Intervening Provider, for precise clarification of the Intervening Provider's role.
- 3) **Have the Intervening Provider speak with the Medical Control physician**, so Medical Control can issue instructions to clarify the extent of the Intervening Provider's role in patient care.
- 4) Speak with Medical Control after he or she has instructed the Intervening Provider, and **obtain clear instruction concerning the role Medical Control has assigned** the Intervening Provider.
- 5) **If possible, inform the patient** that the Intervening Provider is not a member of the MSB EMS, and describe the role the Medical Control physician has assigned the Intervening Provider. If the patient objects, advise Medical Control so the Intervening Provider's role can be reconsidered. Ultimate authority for determining the Intervening Provider's role lies with the Medical Control physician.
- 6) If it is not feasible to contact Medical Control in the initial phases of interaction between the Intervening Provider and MSB EMS, contact Medical Control as soon as feasible, and **document** the reasons initial contact was delayed. Treatment rendered by the Intervening Provider should be documented in the PCR, along with known contact information.

INTERVENING PROVIDER PROTOCOL (cont'd)

MEDICAL CONTROL AUTHORIZATION TO INTERVENING PROVIDERS

The **Medical Control physician** has authority to dictate the extent of the Intervening Provider's involvement, as well as authority to revise these recommendations based on information gained during later phases of the patient's prehospital treatment.

It is the responsibility of the **EMS providers** to keep Medical Control updated on care rendered and changes in patient status, and to carry out any orders from Medical Control regarding the role assigned to the Intervening Provider.

After discussion between the Medical Control Physician and the Intervening Provider, **Medical Control** may authorize the Intervening Provider one of the roles listed below:

- 1) **No participation** in the patient's care
- 2) **Observer or advisor capacity only**
- 3) Provision of **BLS interventions only**
- 4) Assisting with **ALS intervention**, but not as Lead Medic
- 5) Assisting with those interventions included in the **Intervening Provider's usual scope of practice**, but not as Lead Medic
- 6) **Functioning as Lead Medic** and providing interventions within the Intervening Provider's usual scope of practice.

Note: The MSB EMT remains in the role of lead medic until otherwise ordered by the Medical Control physician. If the Intervening Provider is assigned the role of lead medic by Medical Control, they cannot order an EMT to perform activities that are beyond the EMT's level of training or that violate the EMS standard of care.

Possible violations of the EMS standard of care should be reported to Medical Control ASAP so he or she can consider changing the status of the Intervening Provider. If the Intervening Provider has been assigned the role of Lead Medic, he or she should accompany the patient to the hospital.

- 7) Medical Control may assign **other roles** to the Intervening Provider. It is the responsibility of EMS providers and the Medical Control physician to be clear on the assigned role of the Intervening Provider. If further clarification is needed during patient management, the EMS providers must contact Medical Control ASAP.

After transport, **it is the responsibility of the MSB EMT/MICP to write the PCR** and document the participation of the Intervening Provider as well as their contact information. The MSB EMT/MICP may write the PCR with consultation of the Intervening Provider.

DISPATCH PRIORITY

Response Level	Who	Assigned Response Mode
Standby	BLS	All units – YELLOW
A (Alpha)	BLS ¹	All Units - YELLOW
B (Bravo)	BLS ¹	Closest BLS Unit – RED All Other Units – YELLOW
C (Charlie)	ACLS ^{1,2}	Closest BLS Unit – RED Closest ALS Unit – RED All Other Units – YELLOW
D (Delta)	ACLS ^{1,2}	All Units – RED
E (Echo)	ACLS ^{1,2,3}	All Units – RED

1. Automatic Rescue response to all traffic accidents (A-E).
2. Response levels Charlie, Delta, and Echo require ACLS. If ACLS is not immediately available from the assigned ambulance service, ACLS will be automatically requested from the closest service area at time of dispatch.
3. Automatic Rescue response to all Echo calls for service.

PATIENT TRANSPORT MODE

The intent of this protocol is to balance the risks of code red transport with the patient's need to arrive at the Emergency Department in a timely manner. The hazards of operating an ambulance with lights and siren are well established by current research which shows that the patient, the EMS responders and others on the roadway are all subject to increased risk. The average time saving is often small, and may not justify the increased risk of a code red transport.

This protocol does not address the mode of the initial EMS response or of units dispatched to assist an EMS unit; it applies only to patient transport.

- A:** Code yellow transport will be the default mode of transport for all patients – The decision to upgrade to code red will be made by the most senior EMT functioning in a patient care role. A decision to proceed code red will be made only when there is a need to avoid even the slightest delay in ER arrival, and only after weighing the increased risk of this transport mode.
- B:** Upgrade to code red when the patient is unstable and delay in arrival is likely to cause death, deterioration of condition, or loss of limb or organ function.
- C:** Air versus ground transport – When code red transport is selected from a remote location, consider the appropriateness of using air transport instead. (See Criteria for Using Aeromedical Evacuation – this section)

NOTE: Judgment must be used in applying these principles.

For example, while code yellow transport is preferable for the great majority of ACS patients, code red may be appropriate if the cardiac rhythm is unstable, when hypoperfusion is present or when unusual traffic situations imply that lights and siren would save an exceptional amount of time.

Similarly, signs of shock or of internal bleeding in a trauma patient would usually be a reason to transport code red, while “gut feeling” and “mechanism of injury” are rarely legitimate reasons for lights and siren transport unless there is evidence of life-threatening or limb-threatening injuries.

If uncertain whether code red transport is merited, contact the Medical Control physician for instructions.

PATIENT STATUS CRITERIA

CRITERIA	RADIO REPORT
Status 1 – Unstable with immediate threat to life or limb	
<ul style="list-style-type: none"> ▪ Cardiac arrest or post-arrest ▪ Unmanageable airway ▪ Severe respiratory or ventilatory compromise ▪ Hemodynamic compromise (Adult SBP <90, Pedi SBP <80, or requiring fluid resuscitation to maintain BP) ▪ GCS 10 or less (acute change from baseline) ▪ Penetrating injury to head, neck torso or groin ▪ Any major uncontrolled hemorrhage ▪ Head injury with seizures, posturing or inability to respond to simple commands ▪ Flail chest, tension pneumothorax, open pneumothorax or cardiac tamponade ▪ Abdominal rigidity, distension or significant bruising ▪ Paralysis, motor or sensory deficit above wrist/ankle ▪ Two or more proximal long bone fractures ▪ Extremity injury with vascular compromise ▪ 2° or 3° burns >20% TBSA, significant electrical/chemical burns, or inhalation injury ▪ Vaginal hemorrhage in pregnant or post-partum patient <p style="text-align: center;">Cannot be Status 1 based on MOI alone! Must have documented physiological findings!</p>	<p><u>Minimum</u></p> <p>Unit designator Medic name and certification level Status ETA Patient age/sex General nature of problem Major interventions performed Airway status Heart rate & BP</p> <p><u>As time allows & pertinent to care</u></p> <p>Brief pertinent history MOI Pertinent exam findings & vitals Summary of treatment provided Patient response to treatment Repeat status and ETA</p>
Status 2 – Presently stable, but with potential threat to life or limb	
<ul style="list-style-type: none"> ▪ Cardiac-type or other unexplained chest pain ▪ Active seizures refractory to benzodiazepines ▪ GCS between 10 and 13 (acute change from baseline) ▪ 2° or 3° burns involving hands, feet, genitals, joints or TBSA between 5 and 20% <p>Mechanism of Injury</p> <ul style="list-style-type: none"> ▪ Deceleration injuries: Falls greater than 3x body height ▪ MVC (Ejection, same compartment death, rollover, collision >40 mph, extrication >20 minutes, exterior deformity >20", compartment intrusion >12") ▪ Motorcycle MVC >20 mph or separation of rider from cycle ▪ Pedestrians (Child or adult struck >5 mph, pedestrian thrown or run over) <p>Special Alerts (Unless patient meets Status 1 criteria)</p> <ul style="list-style-type: none"> ▪ STEMI Alert (>1mm S-T elevation in 2 or more anatomically contiguous leads) ▪ Stroke Alert – Positive Cincinnati stroke screen 	<p>Unit designator Medic name and certification level Status and ETA Patient age/sex Chief complaint and/or MOI Brief pertinent history Pertinent exam findings (GCS & LOC) Vital signs Summary of treatment provided Patient response to treatment Repeat status and ETA</p>
Status 3 – Stable, with no threat to life or limb	
All other patients not meeting criteria for Status 1 or 2	<p><u>Minimum</u></p> <p>Unit designator Medic name & certification level Status and ETA General nature of problem Major interventions & vitals</p> <p><u>As pertinent to patient's problem</u></p> <p>Brief pertinent history Pertinent exam findings Summary of Tx and pt response Repeat status and ETA</p>
<p>Note: In ALL cases early notification is paramount – for sick patients, the hospital can use the extra time to mobilize resources. For calls that sounded bad in the dispatch, but turn out not be, it keeps them from worrying.</p> <p>If necessary, use dispatch to relay the minimal data set: "Status 1, ETA 20 minutes, 25 year old male with a penetrating wound to the right upper quadrant."</p>	

DETERMINATION OF DEATH IN THE FIELD

Patients found in cardiopulmonary arrest upon EMS arrival, and patients who suffer arrest in EMS presence, will receive CPR and the most advanced resuscitation efforts the responders are authorized to provide except as described below.

As a rule, **Mat-Su Borough EMS providers will NOT make pronouncement of death.** They may decline to begin resuscitation or terminate resuscitation efforts already in progress, based on orders received from a Medical Control physician or upon noting **definite** signs of irreversible death.

Signs of irreversible death (defined as normothermic¹ cardiopulmonary arrest accompanied by one of the following):

- **Dependent lividity¹** – blood that has pooled in the dependent body parts giving reddish or bluish color to the skin where gravity has caused the blood to collect
- **Rigor mortis¹** – stiffening of body and limbs that occurs after death
- **Injuries incompatible with life** – including decapitation, open head injury with loss of brain matter, incineration, a severed body (detruncation) or injuries so extensive that CPR cannot be effectively performed (e.g. frozen body or severe crush injuries to head, neck or chest).

In all cases, **when physician contact CAN be established**, Medical Control **shall** be consulted for pronouncement of death, even if medics observe signs of irreversible death.

DETERMINATION OF DEATH BY EMS PROVIDERS

In extremely rare cases, **when timely physician contact CANNOT be established** by any means, AS 18.08.089 authorizes an EMT (who is an active member of an EMS service) to pronounce death based on:

- 1) Observed signs of irreversible death as listed above, or
- 2) Failure of a normothermic² patient to exhibit ROSC at any time during 30 minutes of properly performed resuscitation at the level to which the EMT is authorized.

MSB EMTs are **ONLY** authorized to utilize this procedure
IF physician contact is NOT possible.

In deciding to terminate resuscitation, also consider the well being of family members, friends and loved ones who are present and their ability to accept the fact of the patient's death. In rare cases, continued resuscitation and even transport may be appropriate when bystanders show extreme resistance to termination of efforts.

DETERMINATION OF DEATH - SPECIFIC CIRCUMSTANCES

¹Drowning/Hypothermia – Rigor mortis and dependent lividity are not reliable signs of irreversible death if hypothermia and cold water drowning precede cardiopulmonary arrest. Survival has been reported with prolonged arrest times.

Aggressive and prolonged resuscitation attempts are indicated for these individuals. Continue resuscitative efforts unless otherwise directed by Medical Control. Injuries incompatible with life (such as airway blocked by ice, or non-compressible chest) are a valid sign of irreversible death; however, Medical Control consultation is required for pronouncement of death, if at all possible.

(For information on resuscitation of hypothermia patients see Adult Medical Section – Hypothermic Cardiopulmonary Arrest)

DETERMINATION OF DEATH IN THE FIELD (cont'd)

DETERMINATION OF DEATH - SPECIFIC CIRCUMSTANCES (continued)

Cardiac arrest – normothermic patient – Treat as per algorithm (See Adult Cardiac Section – Cardiac Arrest algorithm). Contact Medical Control to discuss management options and/or possible termination of resuscitation if the patient is KNOWN to have been pulseless 30 minutes or longer, despite efforts that followed appropriate resuscitation algorithms and included at least 30 minutes of CPR. Consult Medical Control earlier if this does not delay appropriate BLS/ALS interventions or if guidance from Medical Control is needed.

Cardiac arrest – trauma etiology – Treat as per protocol (See Adult Trauma Section – Multisystem Trauma Management – Page 4-4)

After termination of resuscitation – If resuscitation efforts are ended (the code is called) on location prior to transport, **do not move the body**. Tubes, IV lines, EKG patches, bandages, etc. must be left in place after efforts cease. The scene must be preserved until a law enforcement officer assumes responsibility. If resuscitation is terminated en route, transport the body to the receiving hospital at a code yellow rate.

Advance directives – Do not begin CPR, place advanced airway or defibrillate a pt in cardiac or respiratory arrest if the patient has a Do Not Resuscitate (DNR) order issued by a physician. The EMS provider must see this order at the time of the arrest, or must have seen it previously and know it to be still in effect. Notify the ER physician and document the time and location of death.

Comfort One identification is a valid indication of the existence of a DNR order. This may be verified by:

- Observation of the identifying wallet card, necklace, bracelet, etc.
- Verbal verification of Comfort One by the patient's physician, or
- Verbal verification by EMS Dispatch.

Note: If bystanders state that a DNR exists, **but it is not present and has not previously been seen** by the EMS provider, begin resuscitation and contact the Medical Control physician immediately for instructions.

DNR revocation – A Do Not Resuscitate order may only be revoked in the following cases:

- The person for whom the DNR was issued may revoke it.
- The patient's physician or legal guardian may revoke a DNR (If the patient is no longer able to express an opinion on the status of the order).
- The parent of a minor child may revoke a DNR.
- If a person provides information that the patient stated a desire to revoke the DNR, (prior to the arrival of EMS responders) the EMTs should act on the assumption that this information is accurate and begin resuscitation efforts.

If there is any doubt as to whether a valid DNR order is in place, full resuscitative measures are to be initiated by EMS.

Note: Most DNR orders allow measures to increase the patient's comfort. Medications and procedures to *prevent* cardiac arrest are indicated in all cases, except where an EMT knows that they are forbidden by the specific Do Not Resuscitate order.

Advanced directives and pregnancy – Do not withhold resuscitation from a woman who is pregnant with a potentially viable fetus.

Organ donation – If there is an indication that the patient wished to be an organ donor, contact the appropriate hospital for directions. This is NOT a reason to continue resuscitation efforts beyond what is otherwise called for, unless directed otherwise by Medical Control.

DETERMINATION OF DEATH IN THE FIELD (cont'd)

DETERMINATION OF DEATH - DOCUMENTATION

PCR completion – Carefully document the circumstances surrounding the death. Make every effort to include at least the following information:

- **Name** of the deceased
- **Date and time** of death
- All **resuscitation procedures** that were performed
- Patient **response** to treatment (if any)
- Estimated **duration of pulselessness**
- **EKG rhythm** upon termination of efforts
- **Disposition** of the body
- Presence of a **DNR** order or **Comfort One** identification
- Record the **name of physician who ordered termination of resuscitation.**

IMPORTANT: If no physician order terminated the resuscitation, document that physician contact was NOT possible and the patient displayed one or more of the following: (list ALL that are present)

- Rigor mortis
- Dependent lividity
- Injuries incompatible with life (Specify or list the injuries)
- Definite/confirmed pulselessness for 30 minutes or more in a normothermic patient despite appropriate resuscitation efforts (Note: patients in hypothermic arrest should be transported with continuing resuscitation efforts, unless crew exhaustion or safety preclude this.)

Frequently asked questions regarding advanced directives:

Q: What do I do if someone tells me the patient has DNR orders, but does not have a copy of the order to show me?

A: Provide resuscitation efforts by protocol until you can verify the existence of the DNR order by contacting 9G-base, the patient's physician, or Medical Control.

Q: What if the DNR order presented to me IS NOT the Alaska Comfort One format?

A: The State of Alaska acknowledges and upholds ANY legal advance directive, and EMS providers are expected to abide by them. If there is a question as to the validity of documentation provided to you, contact Medical Control for direction.

Q: What if a family member or friend asks me to disregard a DNR and attempt resuscitation?

A: Only the patient (or the patient's physician or legal guardian, or the parent of a minor) may override the DNR. A family member or friend may NOT.

Q: What if a person on scene tells me the patient asked for their DNR to be revoked before EMS arrived?

A: If the person states that they are communicating or relaying the actual wishes of the patient, those wishes are to be honored, and resuscitative efforts employed.

Q: What if I, as an EMS responder, have initiated resuscitation efforts and then someone produces a DNR?

A: The DNR is to be honored, and resuscitation efforts shall be discontinued.

HOSPITAL DESTINATIONS

REQUEST FOR TRANSPORT TO FACILITY OTHER THAN MAT-SU REGIONAL

ALL patients who receive treatment and transport by Mat-Su Borough EMS providers shall be transported to Mat-Su Regional Medical Center ER, with the following exceptions and only under the conditions specified below.

- **When following a MSB EMS protocol** that advises transport to an alternate facility
- **When Medical Control at MSRMC orders diversion** to an alternate facility
- **If a patient initiates a request for transport to a facility other than MSRMC,** contact Medical Control for guidance.

Be prepared to provide the following information to Medical Control:

- 1.) Which facility the patient wishes to be taken to
- 2.) The rationale for transport to an alternate facility
- 3.) The mental and legal competence of the patient
- 4.) The patient's current condition and medical stability
- 5.) The patient's understanding of the services available at MSRMC and that MSRMC is willing to provide treatment within the capability of its facility
- 6.) The patient's understanding of risks secondary to longer transport time
- 7.) Whether the patient has an established physician at the desired receiving facility
- 8.) The patient's understanding that 3rd party payers may have objections to bypassing a facility capable of providing the patient's care

- **EMS personnel shall follow the guidance of Medical Control.** If the patient continues to object, Medical Control will be informed of this and the patient's plan of action. Clear documentation of these parameters and the situation that transpired must be documented in the PCR and immediately forward to the MSB Quality Assurance Manager for further review.

If the patient's plan of action results in an irreconcilable refusal of transport to the facility recommended by MSRMC Medical Control, MSRMC Medical Control should be informed of this and every effort should then be made to contact a receiving physician at the patient's desired destination for further guidance, and to ensure that the patient does receive appropriate medical care.

- **When a patient is transferred to an aeromedical transport service** (or alternate transport service), MSB EMS responders should advise the transport service of the patient's medical needs and may recommend an appropriate transport destination. The final authority for determining the destination is the responsibility of the aeromedical (or alternate) transport service.

CRITERIA FOR USING AEROMEDICAL EVACUATION

In the following instances aeromedical evacuation is preferred over ground transportation:

- Patient condition may require rapid transport to MSRMC, or
- Patient requires transport to another facility that has specialized treatment or interventions not available at our local receiving facility, or
- Time required for ground transport would jeopardize the patient's survival or recovery outcome.

STANDBY PARAMETERS – Any reported incident with a potential for serious trauma that occurs more than 30 minutes from the hospital is cause to put a helicopter on standby. The first trained and reliable person (medic, rescue technician, firefighter, law enforcement officer, etc.) to arrive on scene should determine the number/nature of injuries and decide whether to launch or cancel helicopter response.

LAUNCH PARAMETERS – EMS or other emergency personnel may request that the helicopter be launched if the trauma or medical problem falls into one of the following categories:

- **Multiple Casualty Incident (MCI)** (in which the number or condition of patients exceeds the capabilities of local EMS and/or hospital resources)
- **Major penetrating injury** (to the head, neck, chest, abdomen or groin, with prolonged ground transport time)
- **Head injury** with decreased LOC and prolonged transport time, or head/spinal injury with sensory or motor deficits and prolonged transport time
- **Deep partial-thickness or full-thickness burns of >30% TBSA**, circumferential burns, burns involving respiratory distress, airway compromise or inhalation injury, and a prolonged transport time
- **Near drowning** or **severe hypothermia**, with prolonged transport time
- Injuries involving a **severed or ischemic limb** and prolonged transport time
- Any severe medical problem, such as **AMI** or respiratory distress, for which arrival to the appropriate hospital would be improved by >30 minutes compared to ground transport
- **Acute abdomen** or **suspected internal bleeding**, with a prolonged ground transport time
- **Severe upper or lower GI hemorrhage** and a prolonged transport time
- **Severe vaginal bleeding** with prolonged transport time
- Complicated obstetrical delivery, premature labor or other **complications of pregnancy**, with prolonged transport time
- Any severe medical problem or trauma in a **location that makes ground transportation difficult** or subjects the patient to jostling or rough handling to a degree that may be damaging
- Any situation in which, in the opinion of the medics on scene, the time necessary for ground transport or the conditions attending such a transport would jeopardize the patient's outcome
- The patient is identified by MSB EMS protocol or MSRMC receiving physician as a **patient that requires emergent therapies not available at MSRMC**
- A medical condition is identified that requires **time-dependent interventions** which could be administered sooner than if patient were transported by ground

CRITERIA FOR USING AEROMEDICAL EVACUATION (cont'd)

OTHER FACTORS that may be useful in determining whether aeromedical evacuation is appropriate (if accompanied by a prolonged ground transport time) include the following:

- **Rearward displacement** of a vehicle's front by >20 inches
- **Passenger compartment intrusion** of >12 inches
- **Ejection of patient** from a moving vehicle
- **Death of an occupant** of the same vehicle
- **Pedestrian, cyclist, or ATV rider** struck at a speed >20 mph
- Any patient requiring **prolonged extrication** (>20 minutes)
- Adult trauma patient with **SBP <90 and HR >100**
- Trauma patient with **respiratory rate <10 or** (in an adult) **>30**
- Patient with **Glasgow Coma Score <13**
- Patient with a **compromised airway** or **flail chest**

CANCELLATION – After launching the helicopter, if further evaluation shows that aeromedical evacuation is not needed, the flight should be cancelled.

DESTINATION – The aeromedical transport team will determine the facility to which it is most appropriate to transport the patient. The patient, the EMS crew and the Medical Control physician may supply input to assist this decision.

SHORTER GROUND TRANSPORT TIMES – Aeromedical evacuation is oftentimes not appropriate when the ground transport time is expected to be brief. Three possible exceptions to this are:

- 1) If a life-sustaining intervention, beyond the scope of MSB EMTs, can be accomplished more rapidly by calling a flight crew to the scene than by transporting to the Emergency Room, use aeromedical resources.
- 2) If an immediate life threat is identified that cannot be addressed by MSRMC, use aeromedical resources even when short ground times exist. If in doubt whether MSRMC is an appropriate receiving facility, contact Medical Control.
- 3) Multiple casualty incidents in which the number or condition of the patients exceeds the capabilities of local EMS and/or hospital resources. If in doubt, contact Medical Control.

ADMINISTRATION OF PATIENT'S OWN MEDICATION

Under certain circumstances it may be beneficial for an emergency responder to administer a patient's own medication to him or her. MSB EMS personnel trained to the EMT-1 level or higher are authorized to administer a limited number of such drugs under the circumstances described here.

BEFORE giving any medication the EMT must confirm the following:

- The medication is prescribed for that patient.
- The medication is not expired
- The patient has not already reached or exceeded the maximum dose.

The medication administered should accompany the patient to the hospital, and clear documentation of the name, dose and expiration date should be recorded in the PCR.

EPINEPHRINE

For a patient in anaphylaxis or severe allergic reaction causing respiratory distress, an EMT on location prior to ambulance arrival may administer the patient's own epinephrine via auto-injector. If the patient possesses epinephrine in another form that the EMT has been trained to use, he or she may assist the patient according to the dosage prescribed.

Relative contraindications to epinephrine include: age over 50 years, history of cardiovascular disease, pregnancy, etc. (See Medication Section – Epinephrine 1:1000)

If the ambulance is on location, with a responder trained to the EMT-3 level or higher, he or she should administer epinephrine from the ambulance supply.

BRONCHODILATOR INHALANTS

For a patient in respiratory distress due to asthma or other diagnosed condition for which an inhalant medication has been prescribed, an EMT may assist the patient in taking the medication via metered dose inhaler.

If the ambulance is on location, with a responder trained to the EMT-2 level or higher, he or she should administer nebulized albuterol/Atrovent from the ambulance supply.

NITROGLYCERIN

For a patient with chest pain of suspected cardiac origin an EMT may administer the patient's own nitroglycerin tablets or nitroglycerin spray sublingually, up to 3 doses at intervals of 3 to 5 minutes.

BEFORE administering nitroglycerin to a patient the EMT must verify the following:

- The patient has NOT used phosphodiesterase inhibitors such as **Viagra, Revatio or Levitra in the past 24 hours or Cialis in the past 48 hours.**
- The patient's **SBP >100 mmHg, and HR is >50 and <100 beats/min.**
(This must be verified again before each repeat dose of nitroglycerin)

Note: If the ambulance is on location, with a responder trained to the EMT-3 level or higher, use nitroglycerin from the ambulance supply.

PATIENT REFUSAL OF TRANSPORT

CONSIDERATIONS

MSB EMS personnel are occasionally summoned to patients who refuse transport. When this occurs, if the medics believe that refusal of transport could jeopardize the patient's health, or if the patient has received ANY treatment by EMS, the lead medic shall contact Medical Control for further direction/approval to accept the refusal. Be prepared to provide the following information:

- **Who summoned the ambulance and why?**
- Is it possible or likely that **further harm to the patient would result** without transport for definitive medical attention?
- Has the patient been informed of the **limitations of diagnosis & treatment** from EMS?
- **If further harm could result, has the patient been informed of this**, and is he or she willing to accept responsibility for taking such risk?
- **Have medics been able to adequately assess the patient**, or are they prevented from doing so?
- **Is the patient violent, threatening suicide**, or otherwise a threat to himself/herself or others?
Note: Per MSB protocols, such a patient is NOT considered competent to refuse care or transport. See Appendix – Patient Restraints)
- **Is the patient a non-emancipated minor (<18 years old)** and if so,
 1. Does the patient have a legal guardian?
 2. Can the legal guardian be contacted?
 3. What are the guardian's wishes?
- **Is the patient thinking clearly and competent** to make decisions at this time?
 1. Oriented to person, place, time and situation?
 2. Free of the influence of intoxicants?
 3. Not subject to a condition that might impair the ability to understand consequences of refusing transport and medical care? (diabetic emergency, suspected brain injury, etc.)
- **What are the patient's intentions** if transport is not accepted?
- **Is the patient willing to sign a refusal of care form?**
- **Has the patient been informed that he or she can contact EMS again** if he or she later decides to accept transport?

In the situations where patients have complained about poor outcomes following No Transport decisions, the most common complaints were:

1. **“The ambulance crew talked me out of going”**
2. **“No one told me there was a risk”**
3. **“I was not thinking clearly”**

See the following page for documentation parameters to proactively address these common complaints and protect yourself from potential legal action.

PATIENT REFUSAL OF TRANSPORT

DOCUMENTATION

Every patient care report documenting a patient refusal of transport shall include or address the following items:

- 1.) The **EMS crew was willing to transport** and informed the patient as such
- 2.) The **refusal was initiated by the patient** or patient's guardian
- 3.) The patient was in a mental state conducive to providing a **competent refusal**:
 - Oriented to the situation
 - Able to converse coherently
 - Is not grossly impaired by unstable medical conditions or intoxicants
 - Able to make an informed decision
- 4.) The **medics informed the patient of the potential risks** involved with refusal of transport (risks specific/pertinent to the seriousness of the patient's condition) and that all potential risks cannot be identified by a prehospital evaluation

Note: If the patient is a female of child-bearing age, inquire as to the possibility of pregnancy and provide information regarding specific risks to the unborn fetus (such as abdominal trauma or CO exposure).
- 5.) The patient was informed of potential risks and notified that a prehospital evaluation cannot reliably identify all potential risks
- 6.) The **patient repeated their intent** to refuse or decline transport after being informed of the risks associated with that decision
- 7.) Include the patient's or guardian's **signature of refusal**

If the patient/guardian refuses to sign a refusal, include the following:

 - Verification that the medics requested a refusal of transport signature
 - Reason (if available) the patient or guardian would not or could not sign the refusal of transport
 - Documentation by witnesses that a verbal refusal of transport was given by the patient or patient's guardian
- 8.) Medics advised the patient of **possible contingency plans** after refusal of transport:
 - Call 911 again if condition worsens
 - Travel POV to personal physician or other medical facility
- 9.) **If Medical Control was contacted** in attempting to persuade patient to accept transport, include the following:
 - Name of physician contacted
 - Time and means of communication
 - Instructions received
- 10.) If the **patient accepted any assessment or treatment** prior to refusing transport, all such attention needs to be accurately detailed in the patient care report, with the refusal information.

REFUSAL OF CARE DURING TRANSPORT

On occasion, patients will refuse indicated treatment offered by MSB EMS personnel during transport. Often a clear explanation of the potential benefits of the treatment and the risks involved in refusing such treatment will solve the dilemma, and the patient will consent. Radio or telephone contact with Medical Control may also assist in persuading the patient of the necessity or benefit of such treatment. Occasionally, the patient will continue to refuse, and EMS personnel should proceed as follows.

If the patient is mentally competent, thinking clearly, and can understand the risks of refusing the potential treatment, the patient has the right to refuse. If such a patient cannot be persuaded, the medics should document the refusal, with verification of the following:

- **The patient is thinking clearly and competent** to make decisions.
- **The patient has been informed of the risks of refusing** recommended treatment.

Inform Medical Control as soon as possible that the patient has refused treatment.

If the patient is not mentally competent, being in such condition that he or she is not capable of clearly understanding the benefits of needed treatment and the risks of refusing such treatment (i.e. a minor child, impaired mental status due to intoxicants or medical condition) medics may make reasonable attempts to administer the needed care.

- If possible, discuss the decision to render care against a patient's wishes with the receiving physician prior to doing so. (If delaying to contact the receiving physician could jeopardize the patient's condition, medics should proceed with needed treatment and notify the receiving physician when feasible).
- Include documentation on the PCR: why the medics felt such care was necessary and why the medics deemed the patient to not be mentally competent to refuse

If the medics are confronted with a patient they believe to be not mentally competent, who refuses indicated treatment, they may elect NOT to administer such treatment in the following situations:

- There is compelling reason to believe that attempts to administer such treatment would be technically impossible without the patient's cooperation.
- There is compelling reason to believe that attempts to administer such treatment would elicit a response from the patient that would increase the possibility of an undesirable outcome.

The PCR should include clear documentation of specific reasons that indicated treatment was not administered, and Medical Control should be consulted for guidance as soon as possible.

TRANSPORT OF A MINOR

(Patients who are legally emancipated, pregnant or \geq age18 are treated as adults)

1. When EMS is summoned and a minor is accompanied by their guardian, consent for transport should be obtained from the minor's guardian.
 - a. If the guardian refuses transport of the minor, and it is the belief of the lead EMS medic that lack of transport could jeopardize the minor's wellbeing, the lead medic should contact Medical Control for guidance.
 - b. If a safe and acceptable plan cannot be established with Medical Control, law enforcement should be contacted to evaluate the need to place the minor in protective custody.
2. When EMS is summoned for a minor patient, and no guardian is immediately available:
 - a. If there is **ANY** possibility of adverse outcome due to lack of transport, the patient should be transported to the receiving hospital without delay.
 - b. If assessment reveals **NO** possibility of adverse outcome due to lack of transport, the EMS lead medic should contact the patient's guardian to discuss the minor's disposition and appropriate safeguards.
 - c. If assessment reveals **NO** possibility of adverse outcome due to lack of transport and a guardian is not available, the EMS lead medic should contact Medical Control to discuss the minor's disposition and appropriate safeguards.
3. If transport is deemed necessary for the patient's safety, and obstacles to transport arise, law enforcement should be contacted for assistance.

TRANSFERRING PATIENT CARE

A MSB EMS provider caring for a patient must turn over that patient's care to another health care provider in an efficient and orderly manner, whether to another Borough responder, med-evac personnel, an ER physician or a hospital staff member. This protocol is intended to standardize that transfer of patient care and responsibility.

On-scene transfer of care: On-scene, the EMS provider who first contacts the patient will assume responsibility for that patient's care. This will include providing care at his or her level of training and requesting assistance from more highly trained responders as needed. Should a more advanced-level EMS provider arrive, the initial provider will turn patient care over only when the patient's condition or problem requires additional care.

An advanced level EMT may transfer patient care to an EMT of a less advanced level only when, in the best judgment of the more advanced EMT, there is no need for care beyond the level of the incoming medic's abilities.

In either case, the initial provider will provide the incoming medic with the following minimum information:

- Description of injuries or medical problems
- Vital signs taken
- Any pertinent history of the patient or the incident
- All treatments provided
- What is requested of the additional caregiver

It is the responsibility of EMS providers of all levels, coming into an incident after care has begun, to make themselves known to the EMS personnel or Incident Commander before initiating treatment of a patient. The incoming personnel shall assume the direct care of a patient or override another care giver only when the patient is clearly in immediate need of intervention.

If an on-scene provider is not known to be a MSB EMS responder, the MSB EMT must ask this responder to identify himself or herself and also ask if he or she is a member of the Mat-Su Emergency Services. If the on-scene provider is not a member of Mat-Su Emergency Services (See Appendix – Intervening Provider Protocol).

Transfer of Care to Receiving Hospitals – Patients Transported from the Field:

During transport of any patient from the field to a hospital, the ambulance crew will establish radio or cell telephone contact with the ER and provide a brief status report for the patient(s) being transported. On arrival at the hospital, the EMT who had primary responsibility for the patient will give the hospital staff or physician a brief summary report on the patient's status and any treatments provided. The EMT will remain available for a brief period of time to answer questions about the patient. The report given to the receiving facility should include, when feasible:

- Patient name and age
- Chief complaint
- History of present illness and/or mechanism of injury
- Physical examination, including vital signs
- Current medications and any known allergies
- Relevant medical history
- Interventions taken by EMS providers
- EKGs and Rhythm strips
- Completed Patient Care Report

(continued next page)

TRANSFERRING PATIENT CARE (cont'd)

Transfer of care to receiving hospitals – patients transferred from other facilities:

During transport, the ambulance crew will give the receiving hospital a brief summary report, via radio or cell telephone, of the patient's status and any special needs the crew or patient may have on arrival. All records, charts and patient items will be taken with the patient, given to the receiving hospital and documented on the PCR.

On arrival at the receiving hospital, the EMT will provide a summary of the patient's status during transport and any other pertinent information regarding the patient's condition. The name of the person to whom the report is given should be documented on the PCR.

Transfer of care to air ambulance or other transport service: Prior to transferring any patient under the responsibility and care of MSB EMS, the EMT responsible for the patient must determine that air transport is in the patient's best interest. If there is any question, consult immediately with the ER physician at MSRMC.

Because a MSB EMT will usually not accompany the patient in flight to the receiving hospital, it is imperative that ALL required information be relayed to the flight crew. It is the EMT's responsibility to assure that the following information, AT MINIMUM, is passed on to the flight crew:

- Mechanism of injury or nature of illness
- Medical history (if known)
- Results of physical exam
- All vital signs
- All interventions/treatments and the results
- Any other information pertinent to long-term treatment of the patient

In the event a patient is transported by air, a MSB Patient Care Report must still be completed for the patient.

The name of the flight service must be documented on the PCR.

PATIENT CARE DOCUMENTATION

Documentation of assessments and patient care shall be done for all patients evaluated including, but not limited to: emergency responses, transfers, patient refusals, downgrades and stand-by circumstances.

Documentation of patient care shall be done immediately upon completion of patient care, and/or transfer of care. The only exceptions to this practice are personal safety issues. The EMS Patient Care Report (PCR) is a medical record and the primary source of information for continuous quality improvement review. Pre-hospital care personnel shall be responsible for providing clear, concise, complete and accurate documentation. The prehospital provider who writes the report must include his or her name, EMT level and signature on the report. All treatments, interventions and responses to treatments must be documented in the PCR. The lead medic must ensure that the PCR and underlying copies are accurate and legible.

When a patient is transported, the PCR will be delivered with the patient to the hospital. Vital information should also be immediately communicated to the Emergency Department staff for efficient and safe transfer of care.

The PCR shall be left at the receiving facility. Every effort shall be made to be certain that the nurse and/or physician responsible for care receive the record in a timely manner. In the event the crew is called out of the hospital to respond to an emergency call, the run form must either be faxed to the facility immediately following the call, or hand-delivered. All PCRs must be provided to the hospital as soon as possible.

Failure to leave a PCR is considered to be just cause for disciplinary action.

Question: What is so important about leaving a run form if no one is going to read it?

Answer: While it may often seem like no one reads the run form a medic leaves, this is not the case. The prehospital run form is essential reading to the emergency physician and later physicians in the patient's continuing care and EMS quality improvement. It is also essential that that pre-hospital EKG strips be provided with the PCR.

ASSESSMENT SCALES

APGAR NEONATAL ASSESSMENT

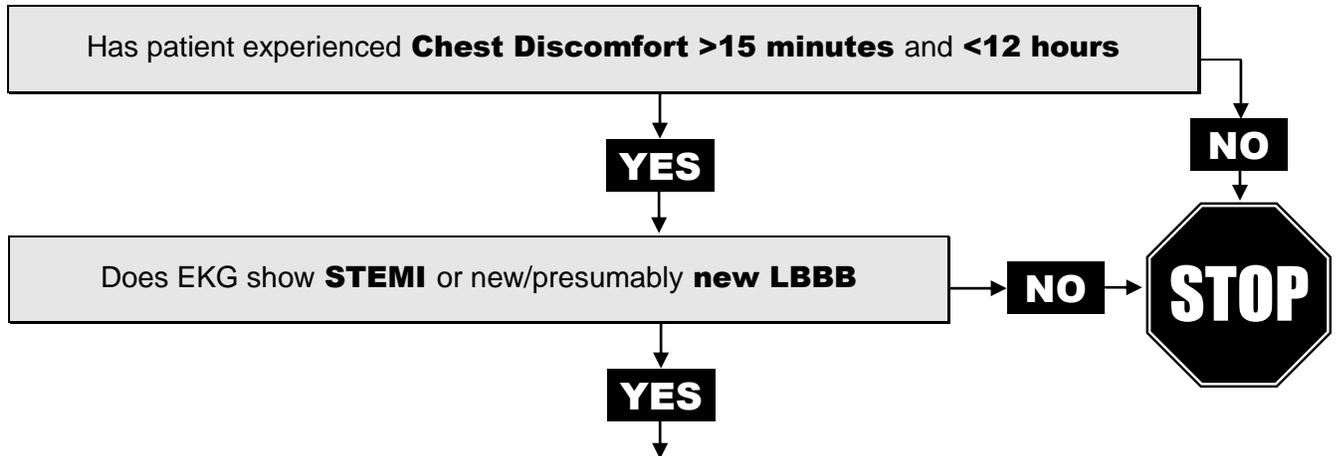
Element	0	1	2	Score
Appearance (Skin Color)	Body/Extremities Blue or Pale	Body Pink Extremities blue	Completely Pink	
Pulse Rate	Absent	Less than 100/min	100/min or more	
Grimace (Irritability)	No Response	Grimace	Cough, Sneeze or Cry	
Activity (Muscle Tone / Movement)	Limp	Some Flexion of Extremities	Active Motion	
Respiratory Effort	Absent	Slow and Irregular	Strong Cry	
Total Score:				

Traditionally APGAR scores are obtained at 1 and 5 minutes post birth, but they should not delay needed interventions.

GLASGOW COMA SCALE

	<u>ADULT/CHILD</u>	<u>INFANT</u>	<u>SCORE</u>
EYE OPENING	4 – Spontaneous	4 – Spontaneous	
	3 – To Speech	3 – To Speech	
	2 – To Pain	2 – To Pain	
	1 – No Response	1 – No Response	
VERBAL RESPONSE	5 – Oriented	5 – Coos and Babbles	
	4 – Confused Conversation	4 – Irritable Cry	
	3 – Inappropriate Words	3 – Cries in Pain	
	2 – Incoherent Sounds	2 – Moans in Pain	
	1 – No Response	1 – No Response	
MOTOR RESPONSE	6 – Obeys Commands	6 – Spontaneous Movement	
	5 – Localizes Pain	5 – Withdraws to Touch	
	4 – Withdraws from Pain	4 – Withdraws from Pain	
	3 – Flexion response to Pain	3 – Flexion response to Pain	
	2 – Extension response to Pain	2 – Extension response to Pain	
	1 – No Response	1 – No Response	
<u>TOTAL SCORE</u>			

MSB ACUTE CORONARY FIBRINOLYTIC CHECKLIST



Are there Contraindications to Fibrinolysis
 If **ANY** one of the following is checked **YES**, fibrinolysis **MAY** be contraindicated

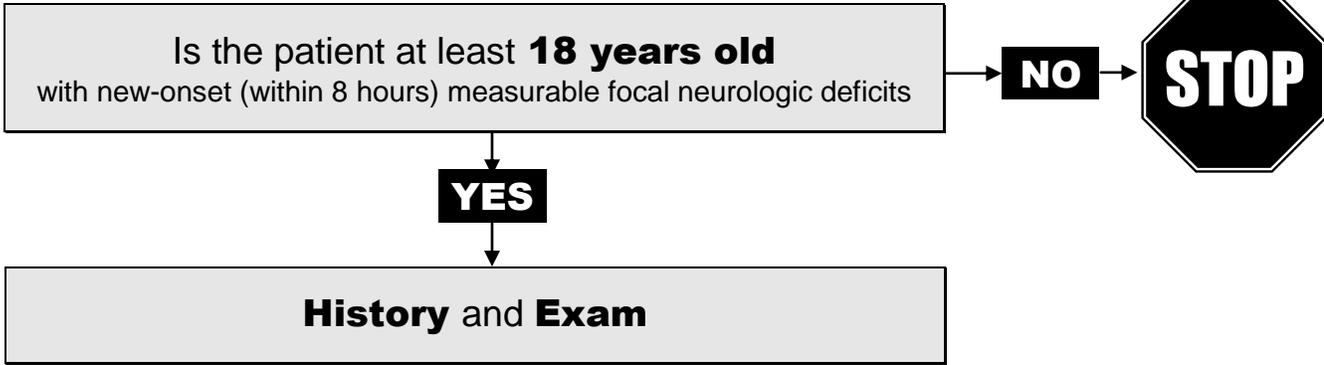
- | | | | |
|---|-------------------------------------|-----------------------------|---------------------------------|
| Systolic BP >180-200 mmHg or diastolic BP >100-110 mmHg | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Right arm vs left arm systolic BP difference >15 mmHg | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| History of structural central nervous system disease | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Significant closed head / facial trauma within previous 3 weeks | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Stroke >3 hours or <3 months | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Recent (within 2-4 weeks) major trauma, surgery (including laser eye surgery) | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| GI or GU bleed | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Any history of intracranial hemorrhage | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Bleeding, clotting problem, or blood thinners | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Pregnant female | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Serious systemic disease (advanced cancer, severe liver or kidney disease) | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |

Is the patient at high risk
 If **EITHER** of the following is checked **YES**, consider transfer to PCI facility

- | | | | |
|---|-------------------------------------|-----------------------------|---------------------------------|
| Signs of cardiogenic shock or pulmonary edema | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |
| Probable contraindications ¹ to fibrinolytic therapy | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Unsure |

Note 1: Probable contraindications to fibrinolytic therapy include a “YES” answer to any of the questions listed above.

MSB PREHOSPITAL STROKE CARE CHECKLIST



Does patient have history of chronic focal neurological deficits **YES** NO Unsure

Time and date patient was last seen "normal"
(free of new onset focal neurological deficits) _____

Cincinnati Prehospital Stroke Screen (Does the patient have NEW symptoms of any of the following)

Facial motor deficits **YES** NO

Arm drift or grip asymmetry **YES** NO

Speech deficits / difficulty repeating "Time is of the essence" **YES** NO

Describe in detail (including location) any new weakness and any other focal neurological signs and symptoms noted: _____

Has significant clearing of symptoms been observed since onset **YES** NO Unsure

Initial evaluation: Blood sugar _____ mg/dl
 Blood pressure _____ mmHg
 SPO₂ _____% on _____ liters per minute O₂
 Cardiac rhythm _____

Has seizure activity been observed just before or since symptom onset **YES** NO Unsure

Has patient had known recent exposure to intoxicants **YES** NO Unsure

Thrombolytic Checklist

Patient currently using anticoagulants (warfarin/coumadin, heparin, Lovenox, or Fragmin)
 Or any known bleeding disorders (hemophilia or Von Willenbrand Disease) **YES** NO Unsure

Any known Hx of intracranial hemorrhage, aneurysm, arteriovenous (AV) malformation or brain cancer **YES** NO Unsure

Within 3 months: Previous stroke, intracranial surgery, serious head trauma **YES** NO Unsure

Within last 21 days: Active internal bleed (include GI/urinary, exclude menses) **YES** NO Unsure

Within last 14 days: Any major surgery or serious trauma **YES** NO Unsure

Within last 7 days: Lumbar puncture, spinal tap **YES** NO Unsure

Recent AMI (past 3 months) or arterial puncture at noncompressible site (7 days) **YES** NO Unsure

CINCINNATI PREHOSPITAL STROKE SCALE

SIGN/SYMPTOM – FACIAL DROOP

How to test: Have patient show their teeth or smile.

Normal: Both sides of the face move equally.

Abnormal: One side of the face does not move as well as the other.

SIGN/SYMPTOM – ARM DRIFT

How to test: Instruct patient to close his or her eyes and extend both arms straight out with palms turned up, for 10 seconds.

Normal: Both arms move the same, or both do not move at all.
(other findings, such as pronator drift, may be helpful)

Abnormal: Either one arm does not move, or one-arm drifts downward compared to the other.

SIGN/SYMPTOM – SPEECH

How to test: Have the patient repeat “***Time is of the essence.***”

Normal: The patient says correct words with no slurring of words.

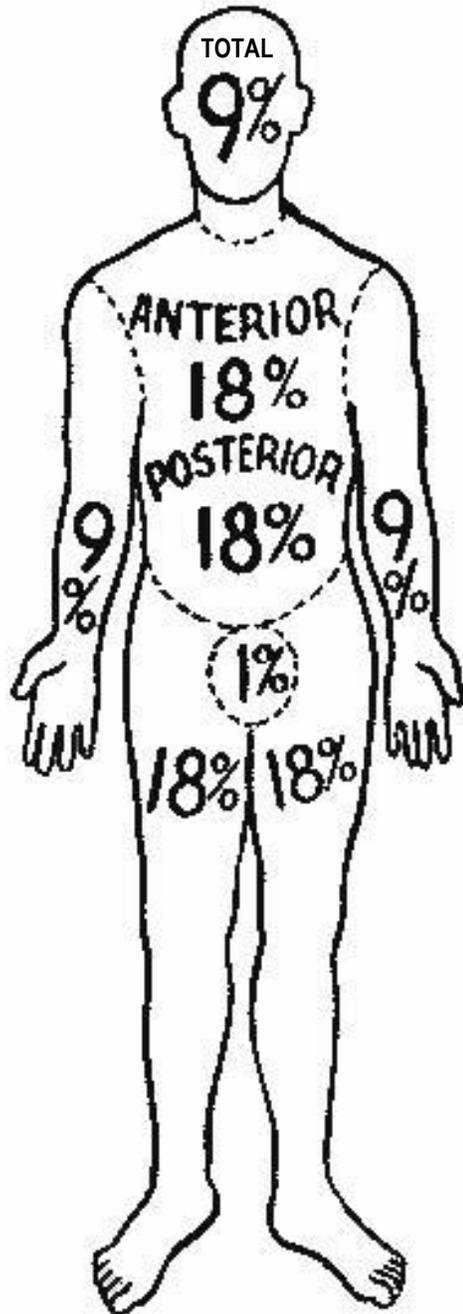
Abnormal: The patient slurs words, says the wrong words, or is unable to speak.

INTERPRETATION If any 1 of the 3 symptoms is abnormal, probability of stroke is **72%**

Early notification of the receiving hospital is essential to ensure immediate availability of appropriate in-hospital response.

RULE OF NINES – ADULT

Use the following diagram to estimate the TBSA (total body surface area) affected for an adult patient who has suffered significant burn injury. When estimating burn size, include only burns that are 2nd degree or greater.



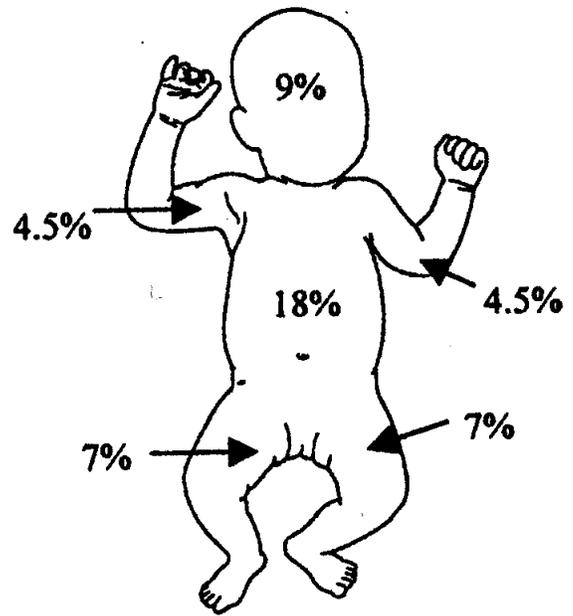
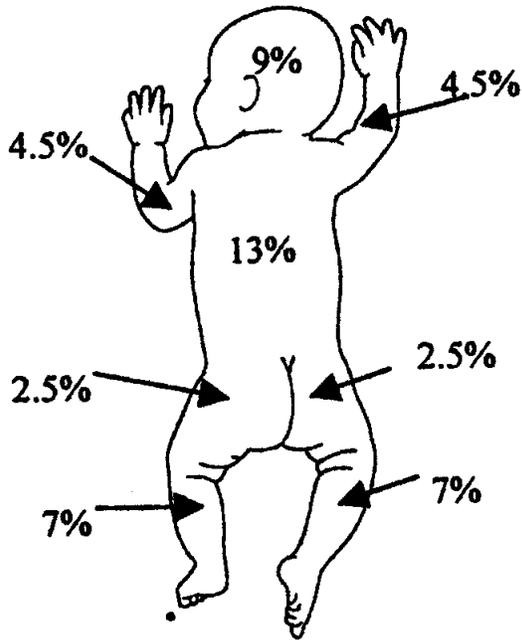
- Entire **head** = **9%** TBSA
(front & back)
- Entire **arm** = **9%** TBSA
- Entire **front torso** = **18%** TBSA
- Entire **back torso** = **18%** TBSA
- Entire **leg** = **18%** TBSA
- Genitals** = **1%** TBSA

- Palm** of hand = **1%** TBSA
(excluding fingers)

Rule of Palms: the palmar surface (excluding fingers) of the patient’s hand represents approximately 1% of the patient’s TBSA.

RULE OF NINES - PEDIATRIC

Use the following method to estimate the TBSA (total body surface area) affected by burn injury to the pediatric patient. . When estimating burn size, include only burns that are 2nd degree or greater.



Entire head	= 18% TBSA
Entire arm	= 9% TBSA
Entire leg	= 14% TBSA
Entire front torso	= 18% TBSA
Entire back torso (including buttocks)	= 18% TBSA
Palm of hand (excluding fingers)	= 1% TBSA

THORACIC INJURIES

Flail Chest: When adjoining ribs or the sternum (or both) are fractured in more than one place, a segment of the chest wall will lose integrity. It may collapse during inspiration and expand during expiration (paradoxical movement) thus limiting the amount of air that is exchanged in the lungs, resulting in insufficient ventilation and oxygenation.

Pneumothorax: Presence of air in the pleural space (may cause partial or complete lung collapse)

Hemothorax: Presence of blood in the pleural space.

Tension

Pneumothorax: Pressure buildup from air leaking into the pleural space (through an injury in the lung or chest wall) that cannot escape. Increasing pressure within the pleural space causes a shift of the mediastinum away from the injured side, inhibited venous return to the right side of the heart and shock.

Patients experiencing tension pneumothorax will present with:

- Severe **respiratory distress**
- **Diminished or absent lung sounds** on the affected side
- **Hypotension/shock**

Other signs that MAY accompany tension pneumothorax include:

- Subcutaneous emphysema
- Respiratory asymmetry (unequal chest rise)
- Jugular vein distention (JVD)
- Narrowed pulse pressure (SBP/DBP closer together than normal)
- Tracheal deviation (rare)

Sucking

Chest Wound
(Open Pneumothorax)

This occurs when air is drawn into the pleural space from an open chest wound by negative pressure during inhalation

Myocardial

Contusion:

Bruising of the myocardium that may produce dysrhythmias

Cardiac

Tamponade:

Accumulation of blood or fluid in the pericardial sac, produced by blunt or penetrating trauma. May be sufficient to impede cardiac filling and cause poor cardiac output leading to shock. Signs of Cardiac Tamponade include:

- **Muffled heart sounds**
- **Narrowed pulse pressure** (SBP/DBP closer together than normal)
- Jugular vein distention (**JVD**) may also result

Note: Cardiac tamponade differs from tension pneumothorax in that breath sounds are unaffected, and severe respiratory distress is absent.

Laceration or

Rupture of Aorta: The aorta is susceptible to laceration or even transection as a result of a deceleration impact or compression of the chest. The wall of the aorta can be injured without rupture. This condition is known as an aortic aneurysm.

Recognition and appropriate management of an aortic aneurysm can stop progression of the aneurysm to a fatal rupture.

TUBERCULOSIS RISK ASSESSMENT

Tuberculosis is a bacterial infection that most commonly attacks the lungs. The means of transmission is most often through the sputum of an infected person, frequently through droplets carried in the air. Certain masks, if well fitted, will provide protection against these droplets. Such masks should be worn if a patient is believed likely to have tuberculosis. Consider the patient to be a high risk if the answer is “yes” to any of the following questions:

DOES THE PATIENT HAVE:

- History of active TB, latent TB, or a positive TB test without at least three weeks of adequate treatment
- History of recent cough (productive or nonproductive) with or without blood in the sputum
- History of night sweats
- History of hoarseness (not explained by other factors)
- History of recent weight loss (not explained by other factors)
- History of HIV (AIDS) or other condition that may cause immunosuppression
- Residence or employment at one of the following
 - Homeless shelter
 - Correctional facility
 - Substance abuse shelter
 - Long-term health care facility (nursing home, rehabilitation center, etc.)

ONE-TOUCH ULTRA GLUCOMETER

Indications: Known or suspected hypoglycemia
 Altered mental status
 Seizures
 Cerebrovascular accidents (strokes and TIAs)
 Suspected diabetic ketoacidosis (DKA)
 Suspected hyperglycemic hyperosmolar nonketotic syndrome (HHNK)

Required Supplies: Alcohol prep pad 2x2 gauze
 Meter Test strip
 Sterile lancet Band-Aid

- Procedure:**
1. Cleanse the finger to be tested with alcohol prep pad.
 2. Insert test strip (contact bars end first and facing up) into the test port.
 (Verify code number on meter matches code number on test strip vial.)
 3. Use sterile lancet to puncture skin. Massage fingertip gently to obtain drop of blood. (Do not squeeze excessively on the puncture site.)
 4. Hold edge of the test strip to the drop of blood until confirmation window is full. (Do this after the flashing drop symbol appears.)
 5. Apply direct pressure to the puncture site with 2x2 gauze. Apply Band-Aid as needed.
 6. BGL results will appear after glucometer counts down from five to one. Record the BGL. (Example: 104 mg/dl)
 7. Discard used test strips. Dispose of lancet in sharps container.

Display messages: - - - Appears after display check if the meter is not coded.



Flashing blood drop symbol indicates meter ready to accept sample. (Attempting to obtain reading without this symbol showing will result in "Error" message – see below.)

HI Blood glucose reading >600 mg/dl.

LO Blood glucose reading <20 mg/dl.

Er # Errors 1 through 5. Various problems with test strip or blood sample. (Insert clean test strip and re-attempt test)

ADULT AND PEDIATRIC INTRAOSSEOUS ACCESS (EZ-IO)

Indications: An alternative to peripheral IV access in any seriously ill or injured patient in whom peripheral IV access cannot be established in a timely manner and in whom IV therapy is believed to be essential in prehospital management.

For a patient who does not currently require intravenous therapy, but who could decompensate during transport and require emergent IV therapy, a “stand-by IO” is indicated if an IV cannot be established. (The “stand-by IO” entails locating the needed equipment, mentally reviewing insertion technique and locating insertion points to facilitate the procedure if it should become necessary).

Do NOT open sterile packaging or contaminate equipment until decision to insert the IO has been made.

Contraindications: Patient weight under 3 kilograms.

Contraindications to IO insertion at a given site:

- Fracture of bone selected for IO insertion
- Fracture of extremity proximal to insertion site
- Previous significant orthopedic procedures involving bone of insertion site
- Infection at insertion site
- Inability to locate landmarks
- Excessive tissue at insertion site
- Previous attempts at IO insertion in same bone within the last 24 hours

Note: In all the above cases, IO may be placed if an alternative site can be found that does not have the contraindicating condition.

Considerations: Any drug, fluid, or blood product that can be given via IV may be given via IO. Due to anatomy of IO space, **flow rates may be slower** than those achieved with IVs. (Initial 10 ml NS bolus and continued use of a pressure bag may help.)

Insertion of EZ-IO in conscious patients causes mild to moderate discomfort and is **usually no more painful than a large-bore IV**.

Fluid infusion through IO may cause **severe discomfort for conscious pts**. At the EMT-3 / MICP level, low-dose cardiac (2%) Lidocaine may be given if the patient does not have contraindications for Lidocaine.

- Adults: slowly give **Lidocaine 2% 40 mg** IO prior to bolus or infusion.
- Pediatric (weight <40 kg or 88 lbs): slowly give **Lidocaine 2% 0.5 mg/kg** IO prior to bolus or infusion.

Notes: This is the same Lidocaine preparation as used in cardiac patients

If the patient does not require immediate infusion therapy, delay infusion for 1 minute following lidocaine administration to allow for appropriate analgesia .

The IO needle can remain in place for up to 24 hours.

Sizing: EZ-IO PD for patients 3-39 kg
EZ-IO AD for patients ≥40 kg or more
EZ-IO LD may be considered when a longer needle is required

ADULT AND PEDIATRIC INTRAOSSEOUS ACCESS (EZ-IO) **(continued)**

- Procedure:**
- Place **patient in supine position** if feasible
 - Locate bony landmarks.

Site of choice: **Proximal Tibia** – With the knee extended, located two finger-widths below the tibial tuberosity, then 2 finger-widths medial on the flat aspect of the tibia. (In children be very careful to avoid the growth plate of the proximal tibia, which is just above this landmark.)

Alternative sites: **Distal Tibia** – Locate the insertion site 2 finger-widths above the medial malleolus (in either the adult or pediatric patient) along the flat, medial aspect of the tibial shaft.

Humeral Head – Stabilize the patient's hand on his or her Abdomen (the arm should not be moved after insertion). The humeral head insertion site is found slightly anterior to the arm's lateral midline on the greater tubercle of the humeral head. (This is the preferred site for pregnant patients in the 2nd or 3rd trimester.)

- **Prepare site using aseptic technique** - use iodine solution and/or alcohol.
- **Load needle** (adult or pediatric) onto the driver.
- Manually **stabilize extremity**, grasping near (not under) insertion site.
- Press needle against the site at 90-degree angle to the bone, and **operate driver using firm, gentle pressure**. (The black horizontal line on the shaft of the needle should be visible above the level of the skin surface prior to activation of the IO driver. This assures adequate needle length to reach the marrow space.)
- **Stop** when needle flange touches skin or sudden decrease in resistance felt.
- **Remove stylet** - discard in sharps container.
- **Confirm IO placement**.
- **Do not aspirate** bone marrow. (This may cause obstruction in the needle.)
- **Connect** primed IV extension.
- (EMT-3 / MICP) consider low-dose **Lidocaine 2% for conscious patients**, unless contraindicated. (See Medication Section – Lidocaine 2%)¹
- **Flush** or bolus EZ-IO catheter rapidly with 10 ml NS (5 ml for pediatric patient).
Note: This may be very painful for a conscious pt who has not had Lidocaine infused through the IO.
Assess for extravasation; remove if evidence of extravasation is detected. (Select site in alternative bone if another attempt at IO insertion is needed.)
- **Place pressure bag** on the solution to be infused when applicable.
- Dress site; **secure tubing**, and continue to stabilize the involved extremity.
- **Monitor IO site**; reassess for extravasation, and remove if evidence of extravasation is noted.
- Ensure receiving team understands **manufacturer recommendation** that IO be removed within 24 hours.

Note 1: Lidocaine premedication dose is 40 mg slow IO push for adults, 0.5 mg/kg slow IO push for pts <40 kg

King Airway

Indication: For use on patients who require a more definitive airway beyond basic airway adjuncts (BVM with OPA/NPA) or when Endotracheal intubation is unavailable or unsuccessful.

Contraindications: Gag reflex

- Insertion Procedure:**
1. Hold King Airway at the connector with dominant hand. With non-dominant hand, hold patient's mouth open and apply chin lift. Using a lateral approach, introduce tip of airway into the mouth.
 2. Advance the tip behind the base of the tongue, rotating the tube back to the midline as the tip reaches the posterior wall of the pharynx.
 3. Without exerting excessive force, advance tube until base of connector is aligned with the teeth or gums.
 4. Inflate the King Airway with the enclosed syringe and inflate cuff to minimum volume needed to seal the airway.
 5. Perform 5-point auscultation to verify correct placement and effectiveness.
 6. Attach the colormetric CO₂ detector^{1,2} and BVM. While ventilating the patient, assess ventilations and gently withdraw the airway until ventilation is easy and oxygen is free-flowing. Readjust cuff inflation as necessary to maintain an adequate seal.
 7. Always use continuous capnography (EtCO₂) if available.

Sizing:

Connector color	GREEN	ORANGE	YELLOW	RED	PURPLE
Size	2	2.5	3	4	5
Patient height	35-45"	41-51"	4' to 5'	5' to 6'	Taller than 6'
Patient weight	12-25 kg	25-35 kg	n/a	n/a	n/a

Note 1: The EID (esophageal intubation detector / "turkey baster") cannot be used with the King Airway

Note 2: End tidal CO₂ detector – color change may not be accurate until after several breaths have been given:

YELLOW = CO₂ present, tube placed correctly (yellow=yes)

PURPLE = CO₂ absent, incorrect placement (purple=problem)

TAN = indeterminate, re-assess intervention (tan=think)

ENDOTRACHEAL INTUBATION

- Indication:** Unconscious¹ patient with inability to protect own airway from vomitus, secretions, blood, etc.
- Unconscious¹ patient with impending airway compromise due to swelling, inflammation, etc.
- Unconscious¹ patient with need for prolonged positive pressure ventilatory assistance.
- Cautions:** Endotracheal intubation is a highly invasive procedure with potential for patient harm due to:
- Vomiting and aspiration
 - Soft tissue injury, dental trauma
 - Vagal stimulation and bradycardia, especially in children
 - Mislplaced tubes leading to hypoventilation and hypoxia
 - Hypoxia due to prolonged attempts
- Judgment should be exercised as to when the benefits of a secured airway outweigh the risks of intubation. Consider effectiveness of bag-valve-mask ventilation, likelihood of aspiration, ETA to ER etc.
- Required Equipment:** Suction device, laryngoscope handle and blades appropriate to patient size, selection of ET tubes, stylet, 10-ml syringe, securing device or tape, lubricant gel, esophageal intubation detector, end-tidal CO₂ detector. Also, cardiac monitor, stethoscope and pulse oximeter.
- Tube selection:** Most adult males will require an 8.0 to 8.5mm and most adult females a 7.5 to 8.0mm ET tube. Adjust based on patient size. Consult the Broselow tape for pediatric patients. Have tubes ½ size larger and smaller immediately available.
- Procedure:**
- 1) Take **BSI precautions**, including eye protection.
 - 2) **Test suction**, ensure it is working and ready.
 - 3) Whenever possible, **thoroughly oxygenate patient** before intubation, but avoid hyperventilation.
 - 4) **Check tube cuff, laryngoscope light.**
 - 5) **Insert stylet and bend tube to proper shape**, assuring that stylet does not protrude beyond end of tube.
 - 6) **Lubricate tip of ET tube.**
 - 7) If spinal injury is ruled out, **place patient in sniffing position**. If spinal injury is suspected, have assistant perform manual, in-line stabilization of head and neck.
 - 8) Have assistant **employ cricoid pressure** if not already in place.
 - 9) **Avoid hypoxemia** at all times. **Limit intubation attempts to 30 seconds**, and ensure patient is reoxygenated after each attempt. Maintain pulse oximetry >90% if at all possible. Desaturation during intubation attempts of a patient that could be oxygenated and ventilated with a BVM is detrimental.

Note 1: Consciousness is not an absolute contraindication, but difficulties in intubating a conscious patient are great and generally imply that other airway strategies should be employed.

ENDOTRACHEAL INTUBATION (continued)

- Procedure:** (continued)
- 10) **Insert blade** on right side of patient's mouth², displace tongue to left. Lift tongue and lower jaw, without exerting any pressure on the upper teeth
 - 11) **Advance blade**, identifying landmark structures, until glottic opening is seen.
 - 12) **Insert tube** from right side of mouth, through glottis, until cuff is 1-2 cm beyond vocal cords (adult) or until guide mark lies between cords (child). Do not insert the ET tube blindly. It is imperative that the operator visualize the ET tube passing through the vocal cords. If the vocal cords cannot be visualized, withdraw the ET tube and resume BVM oxygenation and ventilation.
 - 13) Carefully **stabilize tube** while withdrawing stylet.
 - 14) **Apply EID** (esophageal intubation detector) for patients > 20 kg and use before next ventilation is given. (See Appendix – Advanced Airway Confirmation Adjuncts)
 - 15) **Inflate cuff** with 5-10 ml air until cuff is firm but not hard.
 - 16) **Attach end-tidal CO₂ detector** and bag-valve device to patient.
 - 17) **Auscultate** 1-2 breaths bilaterally in mid-axillary line, slightly inferior to axilla. Auscultate 1-2 breaths over epigastrium.
 - 18) If breath sounds and esophageal intubation detector suggest **misplaced tube**, withdraw tube immediately³ then ventilate and re-oxygenate with BVM for 1 minute before re-attempting intubation³.
 - 19) After six or more breaths, **note color of CO₂ detector**, for further confirmation of tube placement⁴ (See Appendix – Advanced Airway Confirmation Adjuncts)
 - 20) **Ensure patient is reoxygenated** following intubation. Have assistants monitor heart rate and oxygen saturation throughout procedure.
 - 21) When tube placement is confirmed, **secure tube** with commercial device or tape. Consider immobilizing patient's head as for suspected spinal injury; head movement, especially in pediatric patients, may dislodge tube. Re-evaluate tube position each time patient is moved.
 - 22) Always **use continuous capnography** (EtCO₂) if available

Note 2: Nasal intubation and digital intubation are alternative methods available only to MICPs who have been trained in the procedures. MICPs trained in cricothyroidotomy may perform the technique in extreme circumstances, only after consultation with the Medical Control physician.

Note 3: If difficulties are encountered while placing an ET tube, consider the appropriateness of oxygenation and ventilation via BVM or the use of a King Airway.

Note 4: Colorimetric CO₂ detectors may be unreliable during cardiac arrest. Alternate means of placement verification may be more reliable during pulseless arrest. If proper placement of the ET tube cannot be assured, remove ET tube ASAP and ventilate/oxygenate with BVM.

NASOTRACHEAL INTUBATION **(Trained¹ MICP ONLY)**

Indications: Patient with inability to protect own airway from vomitus, secretions, blood, etc.
Patient with impending airway compromise due to swelling, inflammation, etc.
Patient with need for prolonged positive pressure ventilatory assistance.

Contraindication: Apnea

Cautions: May be more difficult in children under 12 years of age
Nasotracheal intubation is a highly invasive procedure with potential for patient harm due to:

- Vomiting and aspiration
- Soft tissue injury and infection
- Vagal stimulation and bradycardia, especially in children
- Misplaced tubes leading to hypoventilation and hypoxia
- Hypoxia due to prolonged attempts
- Nasal fractures
- Severe head trauma

Judgment should be exercised as to when the benefits of a secured airway outweigh the risks of intubation. Consider effectiveness of bag-valve-mask ventilation, likelihood of aspiration, ETA to ER etc.

Required Equipment:

Working and tested suction device	Appropriate size ET tubes
10-ml syringe	Securing device or tape
Lubricant gel	Vasoconstricting nasal spray
BVM	BAAM [®] Adaptor
End-tidal CO ₂ detector	

Continuous cardiac and SpO₂ monitoring should be utilized when possible.

Tube Selection: An ET tube smaller than what would be expected for orotracheal intubation should be considered. Assess the patient to identify the largest and/or more patent nare. Adjust based on patient size. Have tubes a size larger and smaller immediately available.

Procedure:

- 1) Take **BSI precautions**, including eye protection.
- 2) **Ensure suction is working** and ready.
- 3) Whenever possible, **ensure thorough oxygenation of patient** before intubation, but avoid hyperventilation.
- 4) **Check tube cuff** integrity
- 5) **Instill phenylephrine:** 3 sprays to the appropriate nare
- 6) Apply a liberal amount of lubricant to the tip of ET tube.
- 7) If spinal injury is ruled out, place one hand under the patient's head for airway alignment during insertion. If spinal injury is suspected, have assistant perform manual, in-line stabilization of head and neck.
- 8) Cricoid pressure may be helpful. If desired, an assistant may be used.
- 9) **Avoid hypoxemia at all times.** Monitor SpO₂ and heart rate, reoxygenate as needed or after each attempt.

(Procedure Continued next page)

Note 1: MICPs must be compliant with MSB training requirements for nasotracheal intubation

NASOTRACHEAL INTUBATION (continued)

- Procedure:**
- 10) Insert the tip of the ET tube 1.5 – 2.0 cm into the nare (do not use a stylette), then advance the ET tube downward into the nasopharynx – STOP.
 - 11) Attach a BAAM® Adaptor if desired
 - 12) If c-spine injury is not suspected, listen for air exchange and adjust the head position and cricoid pressure as indicated.
 - 13) Wait for / encourage the patient to inhale
 - 14) Insert tube into the trachea to the hub during inhalation – remove the BAAM® Adaptor.
 - 15) Inflate cuff with 5-10 ml air until cuff is firm but not hard.
 - 16) Attach end-tidal CO₂ detector and bag-valve device – ventilate the patient.
 - 17) Perform 5-point auscultation check to verify correct placement.
 - 18) If breath sounds or CO₂ detector suggest misplaced tube, withdraw tube immediately³ then ventilate and re-oxygenate with BVM for 1 minute before re-attempting intubation³.
 - 19) After six or more breaths, note color of CO₂ detector for further confirmation of tube placement⁴. (See Advanced Airway Confirmation Adjuncts – This Section)
 - 20) Assure that patient is reoxygenated following intubation. Have assistants monitor heart rate and oxygen saturation throughout procedure.
 - 21) When tube placement is confirmed, secure tube with commercial device or tape. Consider immobilizing patient's head as for suspected spinal injury; head movement, especially in pediatric patients, may dislodge tube. Re-evaluate tube position each time patient is moved.

Note 2: MICPs trained in cricothyroidotomy may perform the technique in extreme circumstances, only after consultation with the Medical Control physician.

Note 3: If difficulties are encountered while placing an ET tube, consider the appropriateness of oxygenation and ventilation via BVM or the use of a King Airway.

Note 4: Colorimetric CO₂ detectors may be unreliable during cardiac arrest. Alternate means of placement verification may be more reliable during pulseless arrest. If proper placement of the ET tube cannot be assured, remove ET tube ASAP and ventilate/oxygenate with BVM.

ADVANCED AIRWAY CONFIRMATION ADJUNCTS

With placement of an advanced airway (endotracheal tube or King Airway) a confirmation adjunct should be used to assess for proper placement. The colormetric CO₂ detector can be used with an ET tube or King Airway. The EID (esophageal intubation detector) may be used with ET tubes in patients weighing >20kg (44 lbs) but cannot be used with the King Airway.

Procedure: Following advanced airway placement:

1.) Attach airway confirmation device:

a.) Colormetric CO₂ detector (Adult – pts >15 kg or 33 lbs, Pediatric – pts 1-15 kg or 2-33 lbs)

Note: colormetric CO₂ detector: color change may not be accurate until after several breaths have been given.

YELLOW = CO₂ present, tube placed correctly.² (yellow=yes)

PURPLE = CO₂ absent, incorrect placement.^{1, 4, 5} (purple=problem)

TAN= indeterminate, re-assess intervention.⁴ (tan=think)

b.) EID (only for adults with ET tube) if used, must be checked prior to ventilations or inflation of ET cuff. Rapid inflation suggests tube is in trachea³, while slow or absent re-inflation suggests tube is in esophagus^{1,3}

2.) Confirm absence of epigastric sounds and positive/equal lung sounds.

3.) Ventilate patient with 100% oxygen.

4.) If correct placement is confirmed, secure ET tube and ventilate patient.

5.) Recheck tube placement **OFTEN**: immediately after insertion, after securing tube, during transport, and **EVERY** time patient is moved.

6.) Always use continuous waveform capnography, if available, when the patient has an ET tube (EMT-3A)

Note: Document use of EID / colormetric CO₂ detector and findings when preparing PCR.

Note 1: If the colormetric CO₂ detector or EID indicates incorrect tube placement, immediate direct laryngoscopic observation of tube placement is indicated.

A.) If ET tube is incorrectly placed or observation is unclear:

1. Remove tube IMMEDIATELY
2. Re-oxygenate patient
3. Re-attempt intubation

B.) If observation shows the ET tube properly placed, secure tube in the usual manner, ventilate patient, and monitor en route to the hospital.

Note 2: It is possible for colormetric CO₂ detector to show false positive color change with an esophageal intubation. This can occur for a limited time (usually 5 to 6 ventilations) then color change indicating incorrect placement will occur.

Note 3: The EID may be less reliable in patients less than 20 kg.

Note 4: It is possible to have a false positive placement finding with the EID. If tube tip is just above vocal cords, but not through the cords, rapid inflation of the bulb may occur. Use EID before initial ventilation, without tube cuff inflated.

Note 5: Once a patient has stopped cellular respiration (death) and CO₂ production has ceased, a correct placement color change will not occur, even with a properly placed advanced airway. Further, a correct-placement color change may not occur with low blood flow through the lungs, such as in pulseless arrest (Asystole, VF, PEA) or massive pulmonary emboli.

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

EMT-2

Description: CPAP is a relatively noninvasive form of respiratory support for patients with adequate spontaneous respirations that have significant dyspnea from certain etiologies. It is administered with oxygen and can be used in addition to other indicated therapies (i.e. bronchodilators for reactive airway disease, NTG and Lasix for Cardiogenic Pulmonary Edema, etc) to reduce the work of breathing, provide better oxygenation and diminish progression to respiratory failure and need for intubation. It may be used with DNR / comfort care patients.

Indications: The patient must have an intact respiratory drive with adequate ventilations. (CPAP is contraindicated in patients with respiratory failure requiring assisted ventilations.)

➤ **Severe dyspnea** that causes the following signs/symptoms:

<i>Tachypnea</i>	<i>Accessory muscle use or retractions</i>
<i>Tachycardia</i>	<i>Increasing fatigue</i>
<i>Hypoxemia</i>	<i>Increased CO₂ retention</i>

That are due to:

- Cardiogenic pulmonary edema
 - COPD/Emphysema/Asthma
 - Pneumonia
 - Noncardiogenic pulmonary edema / Near drowning
- CPAP may be used for **less severe dyspnea** that is **not responding** to available prehospital interventions and believed to be due to the etiologies listed above.

Note: Dyspnea due to other causes requires authorization and instruction from Medical control.

- Contraindications:**
- Decreased LOC
 - Inability to follow commands/cooperate
 - Inconsolable agitation
 - Head trauma with suspected increased ICP
 - Known active upper GI Bleed
 - Chest trauma w/suspected pneumothorax
 - Inability to maintain airway
 - Suspected upper airway obstruction
 - **Advanced respiratory failure requiring assisted ventilations**
 - Facial trauma, deformities or tracheotomy preventing a good mask seal

Relative

Contraindications: Prior authorization by Medical Control is required for the following:

- Systolic BP < 90
- Patient age < 8 years

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) cont'd

- Cautions:**
- Nausea
 - Cardiogenic shock
 - History of pneumothorax
 - Excessive oral secretions
 - Possible myocardial infarction
 - Recent surgery of ears, nose, throat, esophagus or stomach (within past 2 weeks)

Directions: Mat-Su EMS personnel who are compliant with Matanuska-Susitna Borough EMS training and quality assurance requirements for CPAP are authorized to use CPAP on indicated patients who have no known contraindications.

- **Ensure adequate oxygen is available** for duration of anticipated transport time; patients often deteriorate when CPAP, once started, is discontinued. Defer implementation of CPAP until an adequate, reliable, uninterrupted source of oxygen is available. (Ensure receiving hospital has sufficient notice that CPAP is being used so CPAP is not interrupted when patient arrives at the receiving facility.)
- **Explain the procedure** to the patient

Note: When the patient is in extremis, immediate implementation of CPAP is allowed.

In less severe cases, prior to implementation of CPAP, a brief trial of medication can be administered, followed by reassessment of the patient to see if dyspnea is relieved.

If dyspnea is mild and the patient is not in distress, CPAP can be deferred.

- **Start CPAP administration at 7.5 cm H₂O** pressure, increase to 10 cm H₂O if relief is not apparent within 3-5 minutes
- **Reassess** patient frequently (q 5 minutes) for:
 - Changes in mental status
 - Vital signs and SpO₂ (discontinue if SBP <90 with signs of deterioration)
 - Respiratory Failure (provide positive-pressure ventilation and/or advanced airway)
 - Signs of pneumothorax (discontinue if signs of pneumothorax develop)
 - GI distress (discontinue for impeding emesis, consider Zofran for nausea)
 - Patient intolerance and/or any adverse reactions
- **Notify Receiving Hospital ASAP**
- **Document** use of CPAP, indication for use, reassessment parameters, and Medical Control contact in the PCR

NASOGASTRIC TUBE INSERTION

MICP

Indications: Gastric distension that impairs ventilation for an apneic patient who has an ET tube in place.

Contraindication: Do not attempt to insert a nasogastric tube if:

- The airway is not already protected with an ET tube.
- The patient is suspected to have facial fractures.
- The patient is believed to have ingested a caustic substance.
- The patient has a penetrating neck wound.
- The patient is believed to have epiglottitis or croup.

Cautions: Any patient with potential C-spine injury should be immobilized prior to attempted insertion.

Suction should be immediately available for any insertion attempt.

Notes:

1. It may happen with certain apneic patients that neither an ET tube nor a King Airway can be inserted. If, in such patients, gastric distension and vomiting are persistent problems, consider placing an NG tube despite the lack of airway protection. Be prepared to deal with increased vomiting, and protect patient's airway throughout.
2. Insertion of an NG tube in a conscious patient is a difficult procedure that is highly unpleasant for both the patient and the medic. Gagging and vomiting occur frequently and should be anticipated. This procedure is to be attempted only by Medical Control direction.
3. An NG tube may be placed down the lumen of a King LTSD. Insert the NG through the lumen and into the stomach if needed to decompress the stomach.

NEEDLE CHEST DECOMPRESSION

- Indication:** Known or suspected tension pneumothorax associated with either traumatic or spontaneous lung collapse and manifested by the following:
- **Extreme dyspnea / air hunger**
 - **Decreased or absent breath sounds** (on the affected side)
 - **Hypotension/shock**
 - **Other signs/symptoms** such as:
 - Asymmetrical chest expansion
 - Jugular vein distension (JVD)
 - Subcutaneous emphysema
 - Cyanosis or other signs of hypoxia
 - Hyper-resonance to percussion on one side
 - Tracheal deviation (late sign)
 - Resistance to assisted ventilations
- Procedure:**
1. Place patient in supine position. If a spinal injury can be ruled out, position with head and chest at a 30-degree upright angle (semi-sitting). Explain procedure and rationale if patient is conscious.
 2. Bare the chest and select site for procedure: 2nd or 3rd intercostal space, mid-clavicular line
 3. Cleanse the skin over the puncture site. It may help to attach a large syringe, which facilitates a secure grip and application of appropriate pressure. Aspirating for air can also alert the responder that the needle tip is in the pleural cavity.
 4. Utilize over-the-catheter needle, size 10 gauge.
 5. Hold the needle/catheter perpendicular to the chest wall, insert straight into the thorax, just above the rib until air is heard escaping.
 6. Advance catheter, and remove needle.
 7. Attach Heimlich valve to catheter, cover puncture site and stabilize catheter.
- Treatment goal:** A correctly performed needle decompression converts a tension pneumothorax to a simple pneumothorax.
- Recommendations:** Do not select a site near a contaminated wound site, scars, or implanted medical device.
- Use the largest catheter available as tissue plugging may occur.
- Cautions:** Be certain to insert needle ABOVE rib, as intercostal nerve or artery damage may occur if needle is inserted below rib.
- Avoid injury to the diaphragm – this can occur if site is too low or patient is not positioned correctly.
- Avoid subcutaneous placement – this can occur if insertion is not perpendicular to chest wall.
- Prevent infections – this late complication be prevented by preparing the skin well.
- Simple pneumothorax – **needle decompression is not indicated** for a simple pneumothorax without evidence of hemodynamic compromise caused by the pneumothorax.

EXTERNAL JUGULAR CANNULATION

MICP

- Indication:** External jugular cannulation is appropriate in the critically ill patient who needs vascular access for fluid or medication administration and in whom no suitable peripheral vein is found, and IO access is not readily obtainable. (Examples: cardiac arrest, multi-system trauma, medical patients exhibiting signs of shock.)
In critical patients of all ages, IO cannulation should be considered.
- Contraindications:** Vein is not visible.
Vascular access is not essential.
- Precautions:** Inadvertent puncture of airway or damage to nearby arterial vessels
- Required Supplies:** All supplies required for peripheral IV access
- Procedure:**
1. Place the patient supine or head down, to distend the vein and to prevent air embolism.
 2. If C-spine injury is not suspected, turn the patient's head to the opposite side of access.
 3. If C-spine precautions are necessary, manually stabilize the head in a neutral position during the procedure.
 4. Cleanse the site utilizing aseptic technique.
 5. Occlude venous return by placing a finger on the external jugular just above the clavicle.
 6. Point the catheter at the medial third of the clavicle and insert it, bevel up, at a 10-30 degree angle.
 7. Enter the external jugular while continuing venous occlusion to prevent an air embolism.
 8. Attach the IV tubing and check patency.
 9. Secure by looping IV tubing over patient's ear (avoid using circumferential dressings/taping). Consider immobilizing the patient's neck to prevent dislodgement of the IV.

M.A.S.T. PANTS

Indications: Hemorrhagic shock
Neurogenic (spinal) shock
Isolated fractures of pelvis, legs - M.A.S.T. may be useful as a splint

Contraindications: Cardiogenic pulmonary edema
Heart failure
Impaled objects in the abdomen
Pregnancy (Contraindicates abdominal component only)
External hemorrhage sites where control of bleeding by direct pressure would be impaired by application of the M.A.S.T.

Precaution: Do NOT delay transport to apply M.A.S.T. pants.

12-LEAD EKGEMT-3 (acquire & report automated reading)
EMT-3A (interpretation)

- Indications:** Any patient suspected of ACS (Acute Coronary Syndrome) including those with any of the following:
- Chest pain, pressure or discomfort
 - Radiating pain to neck or left arm, right arm, shoulder or back
 - Dyspnea
 - Heart failure / cardiogenic pulmonary edema
 - Cardiac arrhythmias
 - Syncope / unexplained falls (specifically in the elderly, pts with cardiac Hx, or those on medications that cause cardiac instability)
 - Altered mental status
 - Profound weakness
 - Epigastric discomfort
 - Sweating unusual for environment (diaphoresis)
 - Nausea, vomiting
 - BGL >500 or diabetic pt with suspected atypical ACS
 - Previous cardiac history or other cardiac factors
 - To clarify a heart dysrhythmia

- Technique:**
1. Remove patient clothing above waist.
Use a gown or sheet to preserve patient modesty.
 2. Apply limb leads. Print 3-lead rhythm strip.
 3. Apply precordial leads.
Place patient in supine position (unless precluded by pt. condition)
Verify that all leads are securely attached.
 4. Acquire 12-lead. Interpret 12-lead printout.

- NOTES:**
- If a 12-lead reveals ST elevation in two anatomically contiguous leads, or possible new LBBB, inform Medical Control as soon as possible so the hospital can prepare resources for the patient.
- A normal 12-Lead EKG does not rule out the possibility of ischemic cardiac disease or AMI and must not be used to screen patients.
- Complete MSB Acute Coronary Fibrinolytic Checklist for any patient with suspected AMI
- Patients who require 12-lead EKGs should also have appropriate supplemental O₂, vascular access and continuous 4-lead cardiac monitoring

Do not delay on-scene time more than 4 minutes to perform 12-Lead EKG

TRANSCUTANEOUS PACING

Indications: Unstable bradycardias (<50 bpm) with signs and symptoms related to the bradycardia (hypotension, acutely altered mental status, signs of shock, ischemic chest discomfort or acute heart failure)

Be ready to pace in the setting of AMI, as follows:

- Symptomatic sinus node dysfunction (“Sick Sinus Syndrome”)
- Second degree type II heart block
- Third degree heart block
- Presumed new LBBB (or known new bifascicular block)

Symptomatic bradycardia with ventricular escape rhythm

Contraindication: Severe hypothermia – Pacing can convert a *physiologic* bradycardia to refractory ventricular fibrillation

Ventricular fibrillation – Pacing attempts would delay appropriate Tx

Bradycardias due to untreated respiratory insufficiency or hypoxemia

ACS with mild bradycardias and no evidence of shock

Procedure & Settings:

1. Apply defibrillation pads **AND** 3-lead EKG electrodes.
2. Set rate at **60-80** (set rate at 100 for pre-pubescent patients unless otherwise ordered by Medical Control)
3. Adjust energy setting to lowest level that produces capture – then increase by 10% to maintain continuous capture
4. Confirm electrical capture. Verify each pacer spike is followed by both a QRS complex and a T-wave.
5. Confirm mechanical capture:
Verify palpable pulse at radial or femoral artery.
6. During pacing efforts, continually re-assess for palpable pulses and continuation of electrical capture (adjust output if needed), obtain BP, and provide supportive care.

Pre-medication: Conscious patients should be pre-medicated for pain during pacing. Give **Fentanyl** 1 mcg/kg IV/IO/IN **OR** **midazolam** 2.5 mg IV/IO/IN (May repeat in 5 minutes if indications for pain control continue and no contraindications are noted)

Contact Medical Control ASAP after pacing is initiated and if additional pain medication is needed.

STANDBY PACING

MSB EMS ambulance crews will provide standby pacing capability by ensuring that a pacer, pacing pads, and a qualified EMT-3A or MICP are available on the ambulance for any patient who may deteriorate and require pacing.

Indications: Patients with hemodynamically significant bradycardias that, after consultation with Medical Control, have received a recommendation to defer pacing.

Patients with 2nd degree type II or 3rd degree AV heart blocks that do not initially require pacing

Patients who, after consultation with Medical Control, are believed to have:

- Symptomatic sick sinus syndrome
- Newly acquired LBBB / bifascicular heart block

Other patients for whom the receiving physician may order standby pacing

Procedure: When standby pacing is ordered:

1. Have EKG monitor/pacer available and ready.
2. Have pacing pads available and EKG 4-lead electrodes in place.
3. Closely monitor patient for signs of deterioration.
4. Contact Medical Control immediately if patient deteriorates.
5. If pacing becomes necessary, follow Transcutaneous Pacing Protocol on previous page.

SYNCHRONIZED CARディオVERSION

- Indications:** Unstable tachycardias with signs and symptoms caused by the tachycardia (such as acutely altered mental status, ischemic chest discomfort, acute heart failure, hypotension or evidence of shock).
- A brief trial of medications is an acceptable alternative first step if a specific dysrhythmia is identified.

Contraindication: Cardioversion is not indicated for the following:

- Sinus tachycardia
- Junctional tachycardia
- Ectopic atrial tachycardia
- Torsades de Pointes
- Pulseless VT
- VF

Caution: Atrial fibrillation – Cardioversion of atrial fibrillation can result in embolic complications, such as stroke. If the patient is severely compromised due to rapid ventricular response, cardioversion is still appropriate, yet it should be delayed if possible until consultation with the receiving physician.

Tachycardias due to drug overdoses or poisonings – Cardioversion is usually ineffective

Urgent cardioversion is usually not indicated for rates <150 bpm.

Preparation: If time allows:

- Establish vascular access.
- Provide oxygen. Check oxygen saturation.
- Prepare advanced airway & suction equipment.
- Pre-medicate with **midazolam 2.5 mg** slow IV/IO or IN

-OR-

- **Fentanyl 1-2 mcg/kg** slow IV/IO or IN
- Contact Medical Control

Procedure & Settings:

1. Apply defibrillation pads
2. Select “Sync” mode (remember to re-select “Sync” mode for repeat shocks)
3. When synchronization markers appear, cardiovert as follows:

Biphasic

PSVT, A-flutter: 50 J, 100 J, 200 J

VT: 100 J, 200 J

A-fib: 120 J, 200 J

Monophasic continue to 300 J and 360 J if needed

INTRANASAL (IN) MEDICATION ADMINISTRATION

EMT-2

- Indications:**
- Need to administer medications when IV or IO routes are unavailable or cases where IV or IO insertion may be hazardous to the medical provider or otherwise undesirable.
 - IV or IO administration of medications is preferred when feasible (see below).
 - If IV access is unavailable or insertion would be hazardous to the medical provider, IN administration of approved medications may be considered in lieu of IO access when it is believed that the patient will respond favorably the medication administered, and IO access is not otherwise warranted.
 - MICP's and EMT-3's may consider IN administration of Fentanyl prior to vascular access in hemodynamically stable patients, with isolated burn or extremity trauma, when vascular access may cause significant anxiety or pain (i.e. children).

- Procedure:**
1. Assess and support ABCs – airway, breathing, circulation
 2. For pulseless patients, proceed to ACLS guidelines
 3. For apneic patients with pulses, establish an airway and begin BVM ventilations with 100% oxygen
 4. Load syringe with desired medication and dose. Attach nasal atomizer
 5. Place atomizer 1.5 cm into the nostril
 6. Briskly compress syringe to give maximum 1 ml of atomized spray per nostril
 8. Continue treating the patient per appropriate protocol
 9. Continuously re-assess the patient

INTRAMUSCULAR (IM) MEDICATION ADMINISTRATION

- Indication:**
- Need to administer medications when IV or IO routes are unavailable, cases where IV or IO insertion may be hazardous to the medical provider or cases where IN medication administration has been ineffective.

- Procedure:**
1. Assess and support ABCs – airway, breathing, circulation
 2. For pulseless patients, proceed to ACLS guidelines
 3. For apneic patients with pulses, establish an oral airway and begin BVM ventilations with 100% oxygen
 4. Load syringe with desired medication and dose and administer IM into deltoid (maximum of 2 ml per injection)
 5. Continue treating the patient per appropriate protocol
 6. Continuously re-assess the patient

Notes: Oxygen, IV access, and monitoring (continuous cardiac monitoring, continuous SpO₂ monitoring, and frequent blood pressure monitoring) are indicated for all patients with acute decreased level of consciousness.

Oxygen, IV access (when appropriate), and monitoring (continuous cardiac monitoring, continuous SpO₂ monitoring, and frequent blood pressure monitoring) are indicated for all patients who receive narcotic analgesics or benzodiazepines.

Check BGL prior to administration of Narcan and administer Dextrose IV/IO or Glucagon IM (EMT-3) if BGL <60 mg/dl

PATIENT RESTRAINTS

Statement: Use of a physical restraint on patients is permissible if the patient poses a danger to himself or others. Only reasonable force¹ is allowed.

Except when immediately needed for protection of the patient, EMS responders or others, restraints may only be used after receiving authorization from the Medical Control physician or an Alaska peace officer. If restraints must be applied before authorization, contact Medical Control for orders as soon as feasible.

Chemical sedation may be administered by an EMT-3 or MICP if authorized by Medical Control (See Adult Medical Section – Extreme Anxiety / Combativeness)

Indications: Restraints are to be applied to patients only in limited circumstances:

- A patient whose medical or mental condition warrants immediate ambulance transport and who is exhibiting behavior that the pre-hospital provider feels may or will endanger the patient or others.
- The pre-hospital provider reasonably believes the patient's life or imminent health is in danger and that the delay in the treatment and transport of this patient would further endanger the patient's life.
- The patient is being transferred to a receiving facility with a medical order for restraint. This order **MUST** be a written order by the physician ordering the transfer or an "on-line medical direction" order allowing the restraints to be utilized in the pre-hospital arena.
- The patient is being transported in the custody of the Police Department and the arresting officer is in the presence of the patient.

Precautions: Restraints shall be used only when necessary to prevent a patient from seriously injuring him/herself or others. They **MUST NOT** be used as a punishment or for the convenience of the ambulance crew, but for the provision of safe transportation and treatment.

Any attempt to restrain a patient involves risk to the patient and the pre-hospital provider. Efforts to restrain a patient shall be done only when there is adequate assistance present.

Patients must have a physical examination performed (if permitted) prior to applying restraints. They should be assessed for extremity injury and for any neurological, metabolic or traumatic injury resulting in decompensation.

Ensure that the patient has been searched for weapons.

In the case of a violent or threatening patient, immediately contact the local Police Department for assistance.

Note 1: Reasonable Force = the minimum amount of force necessary to control the patient and prevent harm to the patient or others in the presence of that patient. This force should not be of such magnitude as to be likely to cause injury.

PHYSICAL RESTRAINT PROCEDURE

Standard: It is the standard of MSB EMS to establish guidelines for the care of a combative patient in the pre-hospital / inter-hospital environment.

Purpose: The purpose of this procedure is to provide a safe environment for EMS crew members and patient by providing guidance as to when and how to restrain patients. This is not intended to be an all-inclusive procedure. There are more comprehensive training systems for initial restraint of patients available.

Procedure:

- A. Upon arrival:
 1. If a patient presents with violent and/or combative behavior, the following should be considered:
 - a. If indicated, wait for law enforcement personnel to arrive and secure the scene. Contact Medical Control physician for a restraint order if an order has not been given by an Alaska peace officer.
 - b. Respect the dignity of the patient, and communicate with him or her in a calm non-threatening manner.
 - c. Assure the safety of the patient and EMS crew. This may require waiting until there are enough personnel to assure that the patient can be restrained quickly.
 - d. In the case of inter-facility transfer, obtain a complete patient medical history of past behavior and any interventions used by the sending facility to care for the patient.
 - e. Complete a thorough physical exam of the patient, and address any treatable causes for the combative state.
 - f. The crew must have a set of scissors available to cut and loosen the restraints if needed.
 2. If the patient remains combative:
 - a. Attempt a non-threatening verbal approach to calm the patient.
 - b. If unsuccessful consider the use of **soft restraints**¹
 - c. Rigid handcuffs are a last resort, due to the possibility the patient may not have a normal pain response to limit his or her reaction to being restrained. Only law enforcement personnel² are authorized to utilize this type of restraint.

Note 1: Soft restraints are those that are padded or not rigid in nature. These are available through MSB EMS supply in disposable or non-disposable form. Kerlix or Kling gauze bandaging may also be used. It is recommended not to cut the roll in half, but to use one roll per extremity. Duct tape or medical tape is also useful. Use caution, and monitor Kerlix or tape restraints for development of skin irritation.

Note 2: If a patient is received from law enforcement personnel with locked handcuff restraints in place, request that a member of law enforcement assist EMS personnel in replacing that restraint method with soft restraints. If soft restraints are not considered a safe option, request that law enforcement personnel accompany the ambulance and be available to remove the handcuffs, should patient condition deteriorate to the point that handcuffs hamper necessary interventions and treatment.

PHYSICAL RESTRAINT PROCEDURE (Cont'd)

Procedure (continued):

3. Soft restraints shall be:
 - a. Inspected every 15 minutes for skin condition, circulation, motor/sensory response.
 - b. Included in documentation.
 4. The crew may elect to delay transport of the patient if they are not assured of the ability to protect themselves and/or the patient.
 - a. The crew may request and add personnel to assist in the event of a problem.
 - b. The crew may request guidance from supervisory personnel regarding transport of the patient.
 5. If transport is decided upon, it is to be accomplished without delay and in accordance with current MSB EMS transport guidelines.
 6. Required documentation:
 - a. Why restraints were applied
 - b. All actions taken to restrain patient
 - c. Possible medical causes (such as hypoxia, hypoglycemia, head injury, shock, etc.) contributing to pt's combative state and therapies administered to address them.
 - d. When and how often restraints were re-assessed to ensure no harm was being done to the patient.
- B. Guidelines for removal of restraints:
1. The general rule is not to remove restraints from any patient who does not have a treatable cause of combativeness or who does have behavioral issues.
 2. If the patient's condition is improved by treatments, it is acceptable to remove some restraints. (Be aware of signs that the patient may deteriorate, as well.) Generally, it is best to release one hand only, to make the patient more comfortable, while maintaining some measure of restraint.
 3. Restraints should be relocated or loosened if they cause any decrease in the patient's circulation or sensory function.

AUTOPULSE

MSB EMS personnel who are compliant with MSB EMS training and quality assurance requirements for the Autopulse are authorized to use the Autopulse in the management of pulseless cardiac arrest.

Patients that meet the requirements for use of the Autopulse must meet both of the inclusion criteria, and have none of the exclusion criteria as listed below:

Indications:

- The Autopulse should be applied to patients in a non-traumatic pulseless cardiopulmonary arrest:
 - (a) After the 1st defibrillation attempt for patients with **Shockable Rhythms**
 - or-
 - (b) Immediately if no readily reversible cause is apparent on initial patient evaluation for patients with **Non-shockable Rhythms** (i.e. PEA and Asystole)

Contraindications:

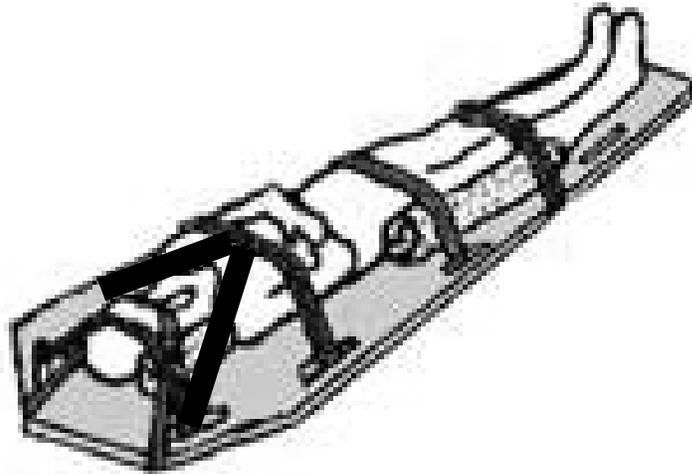
- Pulseless arrest is secondary to trauma
- Patient is less than 8 years old
- Patient's body size is too large for application of the Autopulse life band (the estimated weight limit is 300 lbs)
- The patient displays signs of irreversible death such as rigor mortis, or dependent lividity
- There is reliable evidence that the patient has been pulseless in excess of 30 minutes - 60 minutes for hypothermic arrest
- There is available documentation that the patient has an Advance Directive prohibiting Cardiopulmonary Resuscitation.

The Autopulse will be used and maintained in accordance with guidelines set forth in the MSB EMS Training requirements.

(reference to QA data-gathering deleted)

SPINAL IMMOBILIZATION METHOD

Any patient with a suspected spinal injury should be immobilized as soon as feasible.



As a general rule, patients with suspected spinal injury should be immobilized as shown above, with the spinal column in neutral in-line position. If in-line, neutral position is not believed to be in the patient's best interest, the patient may be immobilized in alternate position and the PCR should contain clear documentation as to how the patient was immobilized and the rationale.

Immobilize the C-spine:

The cervical collar should contact the shoulders and securely support the chin.

If it is not practical or possible to place a cervical collar, immobilize the patient's head and neck with a blanket or towel roll "horse collar," extending from one shoulder, up and around the top of the head to the other shoulder.

Pad the board:

Occipital padding should be used to position the head in a neutral or very slightly flexed position.

Popliteal padding (behind the knees) should provide some flexion to the knees.

Use additional padding between the patient's legs and/or between the patient's body and backboard straps at the legs and flanks to prevent lateral movement if the board is tipped.

Secure patient to the board:

"Spider straps" or speed clips may be used to secure the patient to the backboard.

Begin attaching straps at the shoulders and chest, working toward the feet.

Position the chest strap high on the thorax so diaphragmatic movement remains unrestricted.

Straps should be snug enough to prevent lateral displacement of the patient if the board is tilted.

Prevent lateral movement of the head via blanket or towel roll, foam blocks or commercial "head-bed" device.

Secure the patient's head to the board using 2" tape, ONLY after the body has been completely secured.

Maintain manual C-spine stabilization during the entire immobilization process and release ONLY after all steps listed above are completed.

MAT-SU BOROUGH EMS



Section 9 APPROVED ABBREVIATIONS

10-60 -----	10-code welfare check	AVPU ----	Mnemonic for level of consciousness (Alert, responds to <u>V</u> oice or <u>P</u> ain or <u>U</u> nconscious)
10-79 -----	10-code for deceased	BBB -----	Bundle branch block
AAA -----	Abdominal aortic aneurysm	BGL -----	Blood glucose level
ABCs ----	Airway, breathing, circulation	b.i.d. -----	Twice daily
ABCDE ---	Airway; breathing; circulation; disability; expose	Bilat. -----	Bilaterally
ABD -----	Abdomen	BiPAP ---	Bilevel positive airway pressure
ABG -----	Arterial blood gas	BLS -----	Basic life support
A/C -----	Antecubital	BM -----	Bowel movement
ACE -----	Angiotensin converting enzyme	BP -----	Blood pressure
ACLS ----	Advanced Cardiac Life Support	BSA -----	Body surface area
ACS -----	Acute coronary syndrome	BSI -----	Body substance isolation
AED -----	Automatic external defibrillator	BVM -----	Bag-valve-mask device
A-fib ----	Atrial fibrillation	C - -----	Celsius
A-flutter -	Atrial flutter	\bar{C} - -----	With
AICD -----	Automatic internal cardioverter- defibrillator	C-collar -	Cervical collar
AIDS -----	Acquired immune deficiency syndrome	C-section -	Caesarean section
ALS -----	Advanced life support	C-spine -	Cervical spine
AMA -----	Against medical advice	c/o -----	Complaining of
AMI -----	Acute myocardial infarction	ca -----	Cancer / carcinoma
ant MI ----	Anterior myocardial infarction	Ca -----	Calcium
APGAR -	Numerical system for newborns evaluates heart rate, respiratory rate, muscle tone, reflex irritability and color	CABG ----	Coronary artery bypass graft
ARDS ----	Adult respiratory distress syndrome	CAD -----	Coronary artery disease
ASA -----	Aspirin	cath -----	Catheterization
ASAP ----	As soon as possible	CBC -----	Complete blood count
ASHD ----	Arteriosclerotic heart disease	CC -----	Chief complaint
AV -----	Atrioventricular	CCU -----	Critical care unit
		CHEAT ----	Mnemonic for writing PCR's (Chief complaint, <u>H</u> istory, <u>E</u> xam, <u>A</u> ssessment, <u>T</u> reatment)
		CHF -----	Congestive heart failure
		Cl - -----	Chloride
		CNS -----	Central nervous system
		CO -----	Carbon monoxide
		CO₂ -----	Carbon dioxide
		COPD ----	Chronic obstructive pulmonary disease
		CP -----	Chest pain
		CPAP ----	Continuous positive airway pressure
		CPR -----	Cardiopulmonary resuscitation
		CSF -----	Cerebrospinal fluid
		CSM -----	Circulation, sensation, motor function
		CT -----	Computerized tomography
		CVA -----	Cerebrovascular accident
		CXR -----	Chest X-ray
		D₅W -----	5% dextrose in water
		D₁₀ -----	10% dextrose in water
		D₂₅ -----	25% dextrose in water
		D₅₀ -----	50% dextrose in water
		DBP -----	Diastolic blood pressure
		d/c -----	Discontinue

DCAP-BTLS –Mnemonic for traumatic injuries

(Deformity, Contusion, Abrasion, Puncture/penetration,
Bruising, Tenderness, Laceration, Swelling)

DEA-----Drug Enforcement Agency
Detox-----Detoxification
DKA -----Diabetic ketoacidosis
DM -----Diabetes mellitus
DOA -----Dead on arrival
DOB -----Date of birth
DTs -----Delirium tremens
DUI-----Driving under the influence
DV-----Domestic violence
DWI-----Driving while intoxicated
Dx -----Diagnosis
ECG or **EKG** –Electrocardiogram
ED-----Emergency department
EDC-----Estimated date of confinement
 (due date)
e.g.-----For example
EID-----Esophageal intubation detector
EJ -----External jugular vein
EMS -----Emergency Medical Services
EPI -----Epinephrine
ER -----Emergency room
ETA -----Estimated time of arrival
ET -----Endotracheal tube
ETOH-----Alcohol (Ethanol)
F -----Fahrenheit
FB -----Foreign body
FBAO ----Foreign body airway obstruction
FiO₂-----Concentration of O₂ in inspired air
Fx-----Fracture
GCS -----Glasgow Coma Scale
GI-----Gastrointestinal
g -----Gram
Ga -----Gauge
GSW-----Gunshot wound
gtts/minute –Drops per minute
GU-----Genitourinary
Gx -----Gravida (number of pregnancies)
GYN -----Gynecologic
h or **hr.** ---Hour
H&P-----History & physical
H/A-----Headache
HAZMAT-Hazardous materials
HBV -----Hepatitis B virus
HCP-----Healthcare provider
HCV-----Hepatitis C virus
HCTZ -----Hydrochlorothiazide
HEENT---Head, eyes, ears, nose & throat
HEPA ----High-efficiency particulate air

Hg ----- Mercury
HIPAA---- Health Insurance Portability and
 Accountability Act
HIV --- --- Human immunodeficiency virus
h/o---- --- History of
HR ---- --- Heart rate
HTN -- --- Hypertension
Hx ---- --- History
ICP --- --- Intracranial pressure
ICU --- --- Intensive care unit
IDDM- --- Insulin dependent diabetes mellitus
IM ---- --- Intramuscular
IN ---- --- Intranasal
inf MI ---- inferior myocardial infarction
IO ---- --- Intra-osseous
IV ---- --- Intravenous
IVP --- --- Intravenous push
J-- ---- --- Joules
JVD -- --- Jugular venous distension
K - ---- --- Potassium
kg ---- --- Kilograms
KVO-- --- Keep vein open (see TKO)
l or **ℓ**-- --- Liter
L - ---- --- Left
LAC -- --- Laceration
lat MI---- lateral myocardial infarction
lb- ---- --- Pound
LBBB --- Left bundle branch block
LLQ -- --- Left lower quadrant
LMA-- --- Laryngeal mask airway
LMP -- --- Last menstrual period
LOC -- --- Level of consciousness
lpm--- --- Liters per minute
LR ---- --- Lactated Ringers solution
L-spine-- Lumbar spine
LSD -- --- Lysergic acid diethylamide
LSB -- --- Long spine board
LUQ -- --- Left upper quadrant
MAOI --- Monoamine oxidase inhibitor
MAP-- --- Mean arterial pressure
MAST --- Military anti-shock trousers
mcg -- --- Micrograms
MCI--- --- Mass casualty incident
MCL-- --- Midclavicular line
MCL₁- --- Modified chest lead 1
mEq-- --- Milliequivalent
mg---- --- Milligrams
mg/dl --- Milligrams per deciliter
MI ---- --- Myocardial infarction
MICP- --- Mobile intensive care paramedic
min--- --- Minute

ml ---- --- Milliliters	PEPP ----- Pediatric Education for Prehospital Professionals
ml/hr - --- Milliliters per hour	per ----- By, through or according to
mm --- --- Millimeters	PERL ----- <u>P</u> upils <u>e</u> qual and <u>r</u> eactive to <u>l</u> ight
mmHg --- Millimeters of mercury	Ph ----- hydrogen ion concentration (measure of acidity)
MOI --- --- Mechanism of injury	PICU ----- Pediatric intensive care unit
MVA -- --- Motor vehicle accident	PID ----- Pelvic inflammatory disease
MVC -- --- Motor vehicle collision	PIH ----- Pregnancy induced hypertension
Na ---- --- Sodium	PJC ----- Premature junctional complex
N/A --- --- Not applicable	PMHx ---- Pertinent medical history
NAD -- --- No apparent distress	PND ----- Paroxysmal nocturnal dyspnea
NC ---- --- Nasal cannula	PO ----- By mouth
neg --- --- Negative	pos ----- Positive
NG ---- --- Nasogastric	PO₂ ----- Partial pressure of oxygen
NICU - --- Neonatal intensive care unit	POV ----- Privately owned vehicle
NIDDM -- Non-insulin-dependent diabetes mellitus	PPE ----- Personal protective equipment
NKA -- --- No known allergies	PPV ----- Positive pressure ventilation
NKDA --- No known drug allergies	PRN ----- As needed
NPA -- --- Nasopharyngeal airway	PSVT ----- Paroxysmal supraventricular tachycardia
npo --- --- Nothing by mouth	Pt or pt -- Patient
NRB -- --- Non-rebreather mask	PTA ----- Prior to arrival
NS ---- --- Normal Saline	PVC ----- Premature ventricular complex
NSAID --- Non-steroidal anti-inflammatory drug	Px ----- Number of live births (also para)
NSR -- --- Normal sinus rhythm	q-- ----- Each or every
NSTEMI - Non S-T elevation myocardial infarction	QA ----- Quality assurance
NTG -- --- Nitroglycerin	QI ----- Quality improvement
N/V --- --- Nausea & vomiting	q.i.d. ----- Four times daily
O₂ ---- --- Oxygen	q.h. ----- Each hour
OB ---- --- Obstetric	QR ----- Quarterly review
OD ---- --- Overdose	R - ----- Right
OPA -- --- Oropharyngeal airway	RBBB ---- Right bundle branch block
ophth --- Ophthalmology	RBC ----- Red blood cells
OPQRST Mnemonic to assess pain (Onset; Provocation; Quality; Radiation; Severity)	RLQ ----- Right lower quadrant
OR ---- --- Operating room	R/O ----- Rule out
OSHA --- Occupational Safety and Health Administration	ROM ----- Range of motion
oz ---- --- Ounce	ROS ----- Review of systems
P - ---- --- Pulse	ROSC ---- Return of spontaneous circulation
̄ -- ---- --- After	RR ----- Respiratory rate
PAC -- --- Premature atrial complex	RSI ----- Rapid sequence intubation
PALS --- Pediatric Advanced Life Support	RUQ ----- Right upper quadrant
PaO₂ - --- Partial pressure of oxygen in arterial blood	RVI ----- Right ventricular infarction
PASG --- Pneumatic anti-shock garment	RVR ----- Rapid ventricular response
PCI --- --- Percutaneous intervention	Rx ----- Prescription
PCN -- --- Penicillin	̄ -- ----- Without (also see w/o)
PCR -- --- Patient care report	SAMPLE Mnemonic used for patient history (Signs and Symptoms, Allergies, Medications, Pertinent past medical history, Last oral intake, Events leading to emergency)
PE ---- --- Pulmonary embolism	SBP ----- Systolic blood pressure
PEA -- --- Pulseless electrical activity	sec ----- Second
peds - --- Pediatrics	
PEEP --- Positive end expiratory pressure	

sep MI----Septal myocardial infarction
SIDS - ----Sudden infant death syndrome
SIVP - ----Slow IV push
SL ---- ----Sublingual
SOB - ----Shortness of breath
SpO₂ -- ----Percentage of hemoglobin cells carrying oxygen
SQ – ----Subcutaneous
s/s---- ----Signs & symptoms
START---Simple Triage & Rapid Treatment
Stat/STAT – Immediately
STD -- ----Sexually transmitted disease
STEMI----S-T elevation myocardial infarction
SVT -- ----Supraventricular tachycardia
Sync- ----Synchronized
T ----- ----Temperature
T-spine --Thoracic spine
TB ---- ----Tuberculosis
TBI --- ----Traumatic brain injury
TBSA ----Total body surface area
TIA --- ----Transient ischemic attack
t.i.d. -- ----Three times daily
TCP -- ----Transcutaneous pacing
TKO-- ----To keep open (see KVO)
Tx---- ----Treatment
UNK - ----Unknown
URI--- ----Upper respiratory infection
UTI --- ----Urinary tract infection
VF ---- ----Ventricular fibrillation
VS ---- ----Vital signs
VT ---- ----Ventricular tachycardia
w/---- ----With
w/o --- ----Without (also see $\bar{5}$)
WNL - ----Within normal limits
W/P/D ----Warm, pink & dry (skin assessment)
WPW ----Wolff-Parkinson-White syndrome
x ----- ----Times
y/o or **y.o.** --Years old
1°----- ----First Degree
2°----- ----Second Degree
3°----- ----Third Degree
Δ----- ----Change
Ø----- ----Zero or none
Ψ----- ----Psi (as in psychiatric)
♂----- ----Male
♀----- ----Female
≈ ----- ----About or approximately
= ----- ----Equal
≠ ----- ----Not equal
< ----- ----Less than
> ----- ----Greater than

≤-- ---- --- Less than or equal to
≥-- ---- --- Greater than or equal to
↑-- ---- --- Increasing
↓-- ---- --- Decreasing
#-- ---- --- Pound or number
“-- ---- --- Inch
°F ---- --- Degrees Fahrenheit
°C ---- --- Degrees Celsius

LOCAL ABBREVIATIONS

9G-Base ----MSB Emergency Dispatch
AFD -- --- ----Anchorage Fire Department
AIA --- --- ----Anchorage International Airport
AK Reg. ----Alaska Regional Hospital
API --- --- ----Alaska Psychiatric Hospital
AST -- --- ----Alaska State Troopers
ANMC --- ----Alaska Native Medical Center
ELM AFB----Elmendorf Air Force Base
Enstar---- ----Natural Gas Company
Ft. Rich - ----Fort Richardson Army Base
KGB-- --- ----Knik Goose Bay (Road)
LM-AK--- ----LifeMed Alaska
MATCOM----Law enforcement & animal control dispatch
MEA-- --- ----Matanuska Electric Association
MTA-- --- ----Matanuska Telephone Association
MTR-- --- ----Matanuska Towing & Recovery
MSB-- --- ----Matanuska Susitna Borough
MSROC - ----Mat-Su Regional Outpatient Center
MSPT --- ----Mat-Su Pre-Trial (Palmer)
MSRMC - ----Mat-Su Regional Medical Center
PCC -- --- ----Palmer Correctional Center (Sutton)
Palmer PD --Palmer Police Department
PAMC --- ----Providence Alaska Medical Center
Wasilla PD--Wasilla Police Department

Mat-Su Borough EMS



Section 10

MEDICATIONS

Activated charcoal.....	10-2
Adenosine.....	10-3
Albuterol.....	10-4
Amiodarone (Cordarone).....	10-5
Aspirin.....	10-6
Atropine.....	10-7
Dextrose (D ₅₀ , D ₂₅ , D ₁₀).....	10-8
Diazepam (Valium).....	10-9
Diltiazem (Cardizem).....	10-10
Diphenhydramine (Benadryl).....	10-11
Epinephrine 1:10,000.....	10-12
Epinephrine 1:1000.....	10-13
Fentanyl (sublimaze).....	10-14
Furosemide (Lasix).....	10-15
Glucagon.....	10-16
Ipratropium bromide (Atrovent).....	10-17
Lidocaine 2%.....	10-18
Lidocaine 0.4% premix.....	10-19
Magnesium sulfate.....	10-20
Methylprednisolone (Solu-Medrol).....	10-21
Midazolam (Versed).....	10-22
Morphine sulfate.....	10-23
Naloxone (Narcan).....	10-24
Nitroglycerin.....	10-25
Normal saline (0.9% NaCl).....	10-26
Ondansetron (Zofran).....	10-27
Oral glucose.....	10-28
Oxygen.....	10-29
Phenylephrine HCl (Neo-synephrine nasal spray).....	10-30
Sodium Bicarbonate.....	10-31
Tylenol (acetaminophen).....	10-32

Activated Charcoal

EMT-1 and above
(Requires Medical Control order)

- Description:** Adsorbent that chemically binds toxins and prevents gastrointestinal adsorption
- Indication:** ➤ Known or suspected poisoning/OD (per physician order all certification levels)
Note: may be contraindicated for some poisonings
- Contraindication:** ▪ Patient who is unable to protect airway and at risk for aspiration
- Caution:** □ Use with caution for patient who has ingested a caustic or petroleum based substance
- Dose:** **50 g** or **1 g/kg**
- Route:** PO - usually in liquid slurry form
- Pedi dose:** **1 g/kg** up to 50 g (Note: it is acceptable to approximate the dose)

Notes: Activated Charcoal comes with and without added Sorbitol
Use the preparation without Sorbitol in patients under 32 kg (70 lbs)

Albuterol

EMT-2
EMT-1 may assist with
pt's own medication

- Description:** Synthetic sympathomimetic that causes bronchodilation by stimulating β_2 receptors in smooth muscle of the bronchial tree
- Indications:**
- Dyspnea due to asthma, COPD or anaphylaxis
 - (EMT-1) may assist patient with taking personally prescribed albuterol
 - (EMT-2) may give up to 3 doses (mixed with Atrovent) prior to Medical Control contact. (Contact Medical Control if more than 3 doses needed)
 - If delay in contacting Medical Control is potentially detrimental to a critical patient, give further doses at 15-minute intervals as needed. Contact Medical Control as soon as feasible
 - Known or suspected hyperkalemia
- Contraindications:**
- Allergy to albuterol (rare)
- Precaution:**
- Patient with tachycardia
 - Effects of albuterol may be lessened if patient is taking beta-blocking drugs
 - Can cause paradoxical bronchospasm w/occasional cardiac dysrhythmias
- Side effect:** Tachycardia
Dysrhythmia
- Dose:**
- Dyspnea – **2.5 mg** in 3 ml NS (unit dose) via nebulized updraft
(See "Indications" above for information on repeating albuterol)
- Known or suspected hyperkalemia – **2.5 mg** (unit dose)
(may repeat up to 3 doses – notify Medical Control ASAP)
- Route:** Inhaled as a mist via nebulizer
- Note:** Albuterol (or albuterol/Atrovent) may be given via nebulizer in-line with NRB or BVM. May also be given via nebulizer in-line with bag-valve device to ET tube / King Airway, or nebulizer in-line with CPAP
- Pedi Dose:** (EMT-2) **½ unit dose** (1.25 mg) for patient <6 months
1 unit dose (2.5 mg) for patient ≥6 months
(See "Indications" above for information on repeating albuterol)
- Note:** For patients ≥6 months albuterol may be mixed with Atrovent for asthma, COPD and allergic bronchospasm, if no contraindications for albuterol/Atrovent are present

Amiodarone (Cordarone)

EMT-3 (Pulseless Patients)

MICP (Patients with Pulses)

- Action:** Antidysrhythmic that acts on sodium, potassium and calcium channels
Also has alpha and beta-adrenergic blocking properties
- Indications:**
- (EMT-3) VF / Pulseless VT refractory to defibrillation and epinephrine
 - (MICP) VT with pulse
 - (MICP only after Medical Control Order) May convert other dysrhythmias
- Contraindications:**
- 2nd or 3rd degree AV blocks in absence of functioning pacemaker
 - Known sensitivity to medication
 - Sinus bradycardias
 - SA arrest or block
 - Tricyclic antidepressant and other sodium channel blocker overdose
 - PEA or asystolic arrest
- Precautions:**
- Safety in pregnancy has not been established. May only be given in pregnancy if potential benefit outweighs risk to the fetus.
 - Cardiogenic shock
 - Hx of prolonged Q-T syndrome
 - Torsades de pointes
- Side effects:**
- Hypotension/bradycardia with rapid infusion
- Heart conduction abnormalities
- Dysrhythmias
- Nausea/vomiting
- Dose:**
- VT/VF **pulseless** – **300 mg** IV/IO push
(may repeat **150 mg** after 3-5 minutes if necessary for recurrent pulseless VF/VT)
- VT **with pulse** – **150 mg** IV/IO over 10 minutes
(may repeat same dose after 10 minutes if indications for amiodarone continue)
- Route:**
- IV or IO
(cannot be administered by ET route)
- Pedi dose:**
- VF/VT **pulseless** – **5 mg/kg** IV/IO push not to exceed adult doses.
(may repeat same dose after 3-5 minutes if necessary for recurrent pulseless VF/VT)
- VT **with pulse** – **5mg/kg** IV/IO over 20-60 min (1st dose up to 150 mg)
(may repeat same dose after 10 minutes if indications for amiodarone continue – x2 if indicated)

Aspirin

EMT-2
EMT-1 call-in only

Description: Anti-inflammatory that inhibits platelet aggregation

Effects: Decreased clotting action

Indications: ➤ (EMT-2) Symptoms suggestive of acute coronary syndrome
(Medical Control order required at EMT-1 level)

Contraindications:

- Recent Hx of active bleeding such as ulcer, GI bleed, hematemesis
("Recent" means within approximately 1 month – contact Medical Control in these cases)
- Known allergy to aspirin
- Possible or suspected intracranial hemorrhage

Precautions:

- Patients using blood thinning medications (Coumadin, Warfarin, etc.)
Note: These medications do not contraindicate aspirin, especially when likelihood of ACS is high. When ACS is less strongly suspected, prior consultation with Medical Control is recommended before administration.
- Patients with new onset stroke symptoms (focal neurologic signs) should receive hospital evaluation to rule out intracranial hemorrhage before receiving aspirin
- Patients with suspected dissecting vascular lesions (such as dissecting aortic aneurysms) should also receive hospital evaluation prior to receiving aspirin
- Hx of active ulcer disease or asthma

Dose: **162 mg** (supplied in 81 mg tablets)

Route: PO chewed and swallowed
Make sure patient is alert enough for oral intake

Pedi Dose: No pediatric indications

Atropine

EMT-3

- Description:** Parasympatholytic (anticholinergic) that blocks acetylcholine receptors and is used to increase heart rate in hemodynamically significant bradycardias
- Indications:**
- Symptomatic bradycardia¹ (not effective and possibly harmful for 2° heart block type II and 3° heart block – see precaution below)
 - By physician order for cholinergic poisonings (organophosphates, nerve gas, pesticides, herbicides, etc)
 - By physician order for bradycardia secondary to neurogenic shock
- Precautions:**
- Use with caution in the presence of myocardial ischemia
 - Avoid in hypothermia
 - Not effective / possibly harmful / not indicated for 2° type II and 3° heart blocks
- Side effects:** Tachyarrhythmias
Exacerbation of glaucoma
Precipitation of myocardial ischemia
Pupillary dilation
- Dose:** Bradycardia: **0.5-1.0 mg** IV/IO push at 3-5 min intervals (maximum 3 mg)
- Organophosphate poisoning: Contact Medical Control - may require large doses – maximum dose may exceed 3 mg in these cases
- Route:** IV/IO or ET²
- Pedi dose:** **0.02 mg/kg** IV push (80 lb patient receives adult dose) (minimum dose 0.1 mg)

Note 1: Avoid in hypothermic bradycardia (core temperatures <86° F)

Note 2: May be given ET at 2x the IV dose (maximum 3 mg)

Dextrose (D₅₀, D₂₅, D₁₀)

- Description:** Carbohydrate used to raise blood glucose level in cases of hypoglycemia
- Indications:** Adult or pediatric patient with BGL <60 **and** any of the following:
- Symptoms of hypoglycemia
 - Altered mental status with suspected hypoglycemia
 - Coma or seizure with suspected hypoglycemia
 - Stroke symptoms
 - Tx of reversible cause (hypoglycemia) during cardiac arrest management
- Note:** Patients with BGL <60 without any signs or symptoms of hypoglycemia (including stroke and seizure) should not receive D₅₀
- Newborn infant with signs of hypoglycemia (BGL <40)
- Precautions:**
- Causes tissue necrosis if infiltration occurs
 - Intracerebral hemorrhage may result in newborns with undiluted D₅₀
- Dose:** **25 g** slow IV push
(may repeat once if consciousness is not regained in 3 to 5 minutes)
- Route:** Slow IV – aspirate to confirm IV patency prior to & during administration
- Pedi Dose:**
- | | |
|--------------------------------|--|
| <u>≥ age 2:</u> | 0.5 g/kg slow IV push up to 25 g
(volume – 1 ml/kg) |
| <u>≥1 month to < age 2:</u> | dilute 1:1 with NS (D₂₅) – 0.5 g/kg slow IV push
(volume – 2 ml/kg) |
| <1 month
<u>(newborn):</u> | dilute 1:4 w/sterile H ₂ O (D₁₀) – 0.2 g/kg slow IV
(volume – 2 ml/kg) |

Notes: If vascular access not available and IO not appropriate, consider rectal administration.

See glucagon protocol

Diazepam (Valium)

EMT-3

- Description:** Benzodiazepine used as an anticonvulsant and sedative
- Indications:**
- Status epilepticus (recurrent seizures or seizure >2 minutes in duration)
 - Eclampsia
 - Extreme anxiety state or combative patient (after Medical Control Order)
 - Sedation for pacing
 - ACS associated with cocaine or amphetamine toxicity
 - Amphetamine or cocaine induced ventricular tachycardia and supraventricular tachycardias (SVT, A-flutter, A-fib)
 - Sedation after placement of an advanced airway
 - Anti-shivering agent during post-arrest therapeutic hypothermia
 - Thermal burn pain control (after Medical Control Order)
- Cautions:**
- If patient presents with shock, coma, recent use of alcohol or other CNS depressant – contact Medical Control
 - Can cause respiratory insufficiency
- Side Effects:** CNS depression
Drowsiness
Vertigo
Transient hypotension
- Dose:** For seizure activity or eclampsia – **5 mg** slow IV/IO (repeat same dose in 2 minutes if seizure continues – for further dosing, see Note 1 below)
For extreme anxiety or combativeness – dosing per Medical Control order
For thermal burn pain control – dosing per Medical Control order
For post-arrest hypothermia – **0.2 mg/kg** (maximum single dose 5 mg – adult & pediatric)
All other indications – **5 mg** slow IV/IO (may repeat same dose in 5 minutes if indications for diazepam continue – additional dosing requires Medical Control order)
- Route:** Slow IV/IO push² over 30 to 60 seconds
- Pedi Dose:** Patient <25 kg (55 lbs) – **0.2 mg/kg** (maximum single dose 5 mg - may repeat same dose in 2 minutes if seizure continues – for further dosing, see Note 1 below)

Notes: Contact Medical Control if more than 10 mg (or 2 doses for pediatric patients) are needed to control seizure. If delay in contacting Medical Control is potentially detrimental to a critical patient, administer additional 5 mg doses (or appropriate pediatric doses) at 5-minute intervals as needed. Contact Medical Control as soon as feasible (assess for and treat respirator depression if high doses are used).

If no IV or IO access is available, consider rectal or IM administration at same dose

Diltiazem (Cardizem)

Description: Calcium channel blocker / smooth muscle relaxant that decreases peripheral vascular resistance, dilates coronary arteries and prolongs AV node refractory period

Indications:

- Symptomatic narrow complex atrial fibrillation / atrial flutter with rapid ventricular response that does not require immediate synchronized cardioversion
- Use after adenosine to treat refractory narrow complex re-entrant SVT in patients with adequate blood pressure

Contraindications:

- Hypersensitivity
- Bradycardia or AV blocks
- Hypotension or AMI with cardiogenic shock
- Accessory bypass track (WPW – Wolff Parkinson White syndrome with wide QRS complex)
- VT

Precautions:

- May be ineffective in poisoning / drug-induced tachycardias
- Patients with Hx of heart failure and borderline hypotension
- Patients who are taking β -blockers
- Pregnant patients
- Wide-complex tachycardias (≥ 0.12 seconds) of supraventricular or unclear type (requires Medical Control order)

(Contact Medical Control, if feasible, prior to diltiazem administration for any of these patients)

Side effects:

- Bradycardia
- AV block
- Dysrhythmias
- Hypotension
- Cardiogenic pulmonary edema
- Headache
- Dizziness

Dose: **20 mg** slow IV/IO over 2 minutes
(may repeat same dose after 15 minutes if indications for diltiazem continue)

Note: Mix 100 mg diltiazem in 100 ml saline for 1 mg/ml concentration

Route: IV or IO

Pedi dose: By Medical Control order only

Diphenhydramine (Benadryl)EMT-3A (call-in only)
MICP (call-in for pts <12 yrs)

- Description:** Antihistamine that blocks histamine receptor sites
- Effect:** Reduces discomfort from urticaria/hives and skin irritation resulting from allergic reaction
- Indications:**
- Systemic anaphylaxis (after epinephrine)
 - Allergic reaction not severe enough to require epinephrine
 - Drug-induced dystonic reaction
- Contraindications:**
- Hypersensitivity to Benadryl
 - Asthma (unless wheezing is due to an allergic reaction)
 - Newborns
- Precautions:**
- Patient Hx of non-allergic asthma or chronic bronchitis
 - Patients with glaucoma
 - Children < age 12
 - Known Hx of prolonged Q-T interval
- Side effects:** Drowsiness
Dry mouth
Dysuria (particularly in older men)
- Toxic levels may cause: Wheezing
Headache
Blurred vision
Tremors
Seizure
- Dose:** **25-50 mg** (alternative doses may be authorized by Medical Control)
- Route:** Slow IV/IO push over 1 minute
May also be given IM at same dose
- Pedi Dose:** **1 mg/kg** slow IV/IO to maximum 25 mg single dose over 1 minute
- Note:** Children are very sensitive to Benadryl

Epinephrine 1:10,000

Description: Sympathomimetic that stimulates alpha (α) and beta (β_1 and β_2) receptors

Indications: (EMT-3)

- Cardiac arrest
- Pediatric bradycardia / cardiac arrest
- Newborn resuscitation

(MICP – only by Medical Control order – IV epinephrine bolus or drip)

- Severe anaphylaxis with shock refractory to IM epinephrine
- Bradycardia refractory to atropine and pacing
- Severe hypotension not due to hypovolemia

Precautions:

- May cause hypertension and tachydysrhythmias
- Patients > age 50
- Patients with history of CAD, ACS, or HTN
- Hx of heart failure / cardiogenic pulmonary edema
- Pregnancy

Note: Closely monitor EKG and BP for the patient categories listed above

Side effects:

Tachydysrhythmias

Hypertension

In pregnancy, may reduce fetal blood flow or induce early labor

Headache

Nervousness

Agitation

Dose:

Cardiac Arrest – **1.0 mg** IV push (may be given via ET at double usual dose)

IV bolus or drip for severe anaphylaxis, refractory bradycardia or severe hypotension not due to hypovolemia – **dosing per Medical Control**

(usual infusion begins at 2-10 mcg/min)

Routes:

IV/IO push

ET (double usual dose)

IV drip/infusion (See preparation instructions below)

Epinephrine drip preparation (MICP only)

Mix **2 mg epinephrine 1:10,000** (2 preloads) in **250 ml NS** for 8 mcg/ml drip

Note: This is the preferred concentration, but others may be used. Therefore NEVER mix a drip without clearly labeling the IV bag that contains the epinephrine, including the dose and volume of added epinephrine and the original volume of fluid in the bag. On transfer of care, also relay this information verbally

Pedi Dose:

Pediatric Cardiac Arrest – **0.01 mg/kg** (0.1 ml/kg) IV/IO push

(for ET dosing in pediatric cardiac arrest – See epinephrine 1:1000 – next page)

Newborn Resuscitation – **0.01 to 0.03 mg/kg** (0.1-0.3 ml/kg) IV/IO push

0.05 to 0.1 mg/kg (0.5-1.0 ml/kg) ET

Usual pediatric dosing for epinephrine drip – **0.1 mcg/kg/min** titrated upward to **1.0 mcg/kg/min**

Epinephrine 1:1000

EMT-3
 EMT-1 may administer pt's
 own medication

Description:	Sympathomimetic that stimulates alpha (α) and beta (β 1 and β 2) receptors
Indication:	<p>(EMT-3)</p> <ul style="list-style-type: none"> ➤ Severe allergic reaction / anaphylaxis (via IM) ➤ Severe asthma attack (via IM) ➤ Pediatric cardiac arrest (via ET tube) <p>(EMT-3A – by Medical Control order only – via nebulizer for the following:)</p> <ul style="list-style-type: none"> ➤ Upper airway swelling/obstruction due to croup, epiglottitis, angioedema, etc. ➤ Suspected bronchiolitis/bronchospasm refractory to albuterol/Atrovent
Precautions:	<ul style="list-style-type: none"> ▫ Hx of heart failure / cardiogenic pulmonary edema ▫ Patient > age 50 ▫ Suspicion of AMI, CAD or ACS ▫ Presence of pre-existing tachydysrhythmias ▫ Hypertension ▫ Significant cardiac history ▫ Pregnancy <p>Note: monitor EKG closely for patients presenting the conditions listed above</p>
Side effects:	<p>Tachydysrhythmias Hypertension In pregnancy, may reduce fetal blood flow or induce early labor Headache Nervousness Decreased level of consciousness</p>
Dose:	<p><u>Anaphylaxis / refractory asthma</u> – 0.3 mg (0.3 ml) IM (repeat per Medical Control order if additional doses are needed)</p> <p>Note: If delay in contacting Medical Control would be detrimental to a critical patient, EMT-3 may repeat at the same dose, 15 minutes apart, to a total of three doses. Contact Medical Control as soon as feasible</p>
Route:	IM, ET or nebulized
Pedi Dose:	<p><u>Anaphylaxis / refractory asthma</u> – 0.01 mg/kg (0.01 ml/kg) IM Maximum single dose 0.3 mg (0.3 ml) (repeat per Medical Control order)</p> <p>Note: If delay in contacting Medical Control would be detrimental to a critical patient, EMT-3 may repeat at the same dose, 15 minutes apart, to a total of three doses. Contact Medical Control as soon as feasible</p> <p><u>ET dose in cardiac arrest</u> – 0.1 mg/kg (0.1 ml/kg)</p> <p><u>Upper airway swelling / refractory bronchospasm:</u> Patient \geq age 1 – 5 mg nebulized Patient < age 1 – 2.5 mg (mixed with 2.5 ml NS) nebulized</p>

Fentanyl (sublimaze)

EMT-3 / MICP

Description: Synthetic narcotic analgesic that binds to opiate receptors, altering perception of painful stimuli

- Indications:**
- Acute trauma pain control
 - Premedication for transcutaneous pacing or synchronized cardioversion
 - ACS pain control (by Medical Control order only, and if contraindications to morphine are present)
 - Pain control for thermal burns or frostbite
 - Other pain control (by Medical Control order only)
 - Special circumstances pain control (Medical Control contact not feasible)
 - Pediatric spinal cord injury (by Medical Control order only)
 - Prophylactic pain control prior to vascular access in stable patients
 - Anti-shivering agent for post-arrest therapeutic hypothermia

Contraindication: ▪ Hypersensitivity to drug or components

- Precautions:**
- Use with caution in pregnant patients (Category C)
 - Signs of shock (SBP <90)
 - Chest wall rigidity may occur with larger doses given rapidly (may be overcome by BVM ventilation or reversed with Narcan if unable to ventilate)
 - In combination with other CNS depressants, Fentanyl may potentiate respiratory/CNS depression and hypotensive effects

Side effects:

Sedation	Tachycardia
Bradycardia	Hypotension
GI distress	Respiratory depression
Chest wall rigidity	Apnea
Itchy nose	Blurred vision

CNS/respiratory effects comparable to morphine (rarely causes histamine release)

- Dose:**
- Adult pain control – **1-2 mcg/kg**
(may repeat once if needed in 10 minutes per standing orders – maximum total dosing 3 mcg/kg)
- Premedication for cardioversion/pacing – **1-2 mcg/kg** (no repeat indicated)
- Post-arrest therapeutic hypothermia – **1 mcg/kg**
(may repeat once in 5 minutes if shivering continues and SBP >100 mmHg)
- Special circumstances pain control protocol (adult & pediatric >age 6) – **1-2 mcg/kg**
(repeat dose **0.5-1.0 mcg/kg** at 15-minute intervals, per protocol, if needed and no contraindications exist)

Route: Slow IV/IO over 1 minute or IN

- Pedi dose:**
- Pediatric trauma pain control – **0.5-1.0 mcg/kg**
- Pediatric burn/frostbite pain control – **1-2 mcg/kg**
- Pediatric spinal cord injury – (Per Medical Control order, usual dose **1-2 mcg/kg**)
- Prophylactic pain control prior to vascular access – **0.5-1.0 mcg/kg** via **IN**

Furosemide (Lasix)MICP (call-in after 1st dose)

- Description:** Loop diuretic that inhibits sodium and chloride reabsorption in the kidneys and causes venous dilation
- Indication:** ➤ Cardiogenic pulmonary edema
(MICP may give 1st dose without Medical Control order, except as listed in contraindications and precautions below)
- Contraindications:**
- Systolic BP <90
 - Known allergy to furosemide
 - Pregnancy
- Precautions:**
- Known allergy to sulfa drugs
Note: Medical Control order is required before giving furosemide if pt has Hx of sulfa allergy due to possible cross-sensitivity, unless patient uses furosemide without Hx of sensitivity
 - Assess lung sounds before and after furosemide administration
 - Patients already taking diuretics may require a higher dose
 - Consider ½ dose for patients > age 70 or with liver compromise
 - Closely monitor patient's BP after furosemide administration
 - Do not administer to patient < age 12 without Medical Control order
- Side Effects:** Dehydration
Decreased circulating plasma volume
Decreased cardiac output
Loss of electrolytes K⁺ and Mg⁺⁺
Transient hypotension
- Dose:** **40 mg**
Repeat only by Medical Control order
- Route:** Slow IV/IO over 1 minute
- Pedi Dose:** **0.5-1.0 mg/kg** (per Medical Control direction only)

Glucagon

EMT-3 – IM for hypoglycemia
 EMT-3A – IV/IO other indications

- Description:** Pancreatic hormone used to increase BGL in cases of hypoglycemia when IV access is not available. In higher doses glucagon has additional effects, such as stimulating the sympathetic nervous system.
- Indications:**
- Suspected hypoglycemia in patient without vascular access (EMT-3)
 - Pt in PEA/asystole who takes β -blockers or Ca-channel blockers (EMT-3A)
- (EMT-3A – by Medical Control order only – for the following:)
- β -blocker or Ca-channel blocker OD (non-arrest)
 - Persistent bronchospasm in patients receiving β -blockers
 - Refractory anaphylactic or cardiogenic shock
 - Esophageal food impaction
- Contraindications:**
- Known hypersensitivity
 - Known pheochromocytoma/insulinoma
- Precautions:**
- Mix with own diluent - do not mix with saline
 - May be ineffective for hypoglycemia caused by sulfonylurea (oral diabetic medication)
- Side effects:** Nausea/vomiting
Hyperglycemia
- Dose:**
- Hypoglycemia¹ – **1 mg** (1 unit) IM (may repeat same dose after 15 minutes if needed)
- Cardiac arrest / pt on β or Ca-channel blocker – **5 mg** (5 units) IV
- Other indications^{2,3} – dosage per Medical Control order – usually **5 mg** IV
- Route:** IM for hypoglycemia (IV is the preferred route for other indications)
- Pedi Dose:** **0.5 mg** IM (patient weighing more than 20 kg or 44 lbs receives adult dose)

Note 1: Elevation in BGL will be transitory. Oral carbohydrates should be considered as soon as patient is sufficiently alert if no contraindications to oral intake are identified.

Not all patients will regain consciousness after administration of glucagon.

Pts with depleted glycogen stores, such as chronic alcoholics or malnourished pts, may not respond to glucagon.

IV access should be pursued following administration of IM glucagon.

If evidence of hypoglycemia persists following glucagon, administer IV/IO dextrose as soon as possible.

Note 2: For a known β -blocker OD in an unstable patient with symptomatic bradycardia, hypotension or bronchospasm, where delays in contacting Medical Control are felt to jeopardize patient outcome, an EMT-3/MICP may administer glucagon 5 mg IV – contact Medical Control as soon as feasible.

Note 3: For a known calcium channel blocker OD in a patient with symptomatic hypotension or bradycardia, where delays in contacting Medical Control are felt to jeopardize patient outcome, an EMT-3/MICP can administer glucagon 5 mg IV – contact Medical Control as soon as feasible.

Ipratropium Bromide (Atrovent)

EMT-2
 EMT-1 may administer
 pt's own medication

- Description:** Anticholinergic bronchodilator that is chemically related to atropine
- Effect:** Bronchodilation
- Indication:** ➤ Dyspnea due to asthma, COPD, emphysema, and allergy/anaphylaxis
- Contraindication:** ▪ Known or suspected hypersensitivity to atropine, Atrovent or other atropine derivatives
- Precaution:** □ Known allergy to soya lecithin, soy beans, soy products or peanuts (avoid unless patient has previously used Atrovent without history of sensitivity)
- Dose:** **0.5 mg** in 2.5 ml NS (unit dose) EMT-2 may give **3** doses (mixed with albuterol) prior to Medical Control contact (contact Medical Control if additional is needed)
- Note:** If delay in contacting Medical Control is potentially detrimental to a critical patient, administer further doses at 15-minute intervals as needed – contact Medical Control ASAP.
- Route:** Nebulized updraft
- Note:** Atrovent (or albuterol/Atrovent) may be given via nebulizer in-line with NRB or BVM. May also be given via nebulizer in-line with bag-valve device to ET tube / King Airway or via nebulizer in-line with CPAP
- Pedi Dose:** Patient ≥ 6 months to < age 12 – **0.25 mg** (½ unit dose)
 Patient ≥ age 12 – **0.5 mg** (unit dose)
 See Special Information items 2 and 3 below
- Special Information:**
1. If patient has a known sensitivity to peanuts or soybeans, and has never received Atrovent, DO NOT ADMINISTER Atrovent without Medical Control order, because a cross-allergy may result.
 2. Atrovent is less effective in pediatric patients. Do not administer to patients less than 6 months old without Medical Control order.
 3. In patients 6 months and older, Atrovent may be mixed with albuterol for patients with asthma, COPD, and allergic bronchospasm if patient does not have contraindications for albuterol/Atrovent.

Lidocaine 2%

- Description:** Antidysrhythmic used to treat ventricular dysrhythmias, that also has anesthetic properties
- Indications:**
- Dysrhythmias (VF, VT, Torsades de Pointes)
 - Ventricular dysrhythmias in place of amiodarone (when contraindications to amiodarone exist)
 - Premedication before IO infusion
- Contraindications:**
- 2nd or 3rd degree AV blocks
 - Known sensitivity to medication
 - Idioventricular rhythms
 - Sinus bradycardias, SA arrest or block
 - Ventricular conduction defects (**Note:** not used to treat occasional PVCs)
- Precaution:**
- Discontinue infusion immediately if signs of toxicity develop (See side effects)
- Side effects:**
- | | | |
|---------------------------------|-----------------------|------------------------|
| <u>Early signs of toxicity:</u> | Anxiety | Apprehension |
| | Decreased LOC | Tinnitus |
| Visual disturbances | Euphoria | Combativeness |
| Nausea | Twitching | Numbness |
| Difficulty breathing | Difficulty swallowing | Decreased heart rate |
| <u>Late signs of toxicity:</u> | Seizure | Hypotension |
| | Coma | Widening QRS complex |
| Hallucinations | Hearing loss | Prolonged P-R interval |
- Dose:**
- For dysrhythmias: **1.0-1.5 mg/kg** slow IV/IO (repeat as needed at 5-10 minute intervals at 0.5 to 0.75 mg/kg – maximum total dose 3 mg/kg)
- ET dose for dysrhythmias: **2-3 mg/kg** (maximum total dose 3 mg/kg)
- Premedication before IO infusion: **40 mg** slow IO push (if immediate fluid infusion is not necessary, defer for approximately 1 minute to allow for appropriate analgesia)
- Route:**
- IV/IO – slow push
ET– double IV/IO dose
- Pedi Dose:**
- For dysrhythmias: **1.0 mg/kg** IV/IO – repeat as needed at 5 to 10 minute intervals at 0.5 to 1 mg/kg (maximum total dose 3 mg/kg)
- Premedication before IO infusion: **0.5 mg/kg** slow IO (patients <40 kg)

Lidocaine 0.4% Premix

MICP

Description: Antidysrhythmic used to treat ventricular dysrhythmias

Indication: Consider lidocaine infusion for episodes of VT that do not respond to lidocaine bolus and do not require electrical therapy.

Contraindications:

- 2nd or 3rd degree AV blocks
- Known sensitivity to Lidocaine
- Idioventricular rhythms
- Sinus bradycardias, SA arrest or block
- Ventricular conduction defects (**Note:** not used to treat occasional PVCs)

Precautions: Reduce maintenance dose to ½ (after full loading dose) for the following:

- Patients > age 70
- Patients with heart failure
- Patients with hepatic disease

Stop maintenance drip immediately if signs of toxicity develop (See side effects)

Side effects:

<u>Early signs of toxicity:</u>	Anxiety Decreased LOC Euphoria Twitching Nausea	Apprehension Tinnitus Combativeness Numbness Decreased heart rate
<u>Late signs of toxicity:</u>	Seizure Coma Widening QRS	Hypotension Hearing loss Hallucinations

Visual disturbances
Difficulty swallowing
Difficulty breathing

Dose: Drip rate for **ADULTS** based on lidocaine bolus given during arrest:

- After 1 mg/kg – **2 mg/min** drip (30 gtt/min – 60 drip set) IV/IO
- After 2 mg/kg – **3 mg/min** drip (45 gtt/min – 60 drip set) IV/IO
- After 3 mg/kg – **4 mg/min** drip (60 gtt/min – 60 drip set) IV/IO

(Halve these maintenance drip dosages for patients described above in precautions)

Note: Maintenance drip is only to be given while the patient has spontaneous circulation
If infusion is running and patient arrests, discontinue drip until ROSC

Route: IV/IO drip

Pedi Dose: By Medical Control order only – usual dose **0.02-0.05 mg/kg/min**

Magnesium Sulfate

EMT-3A

Description:	Electrolyte that has many functions including that of a physiologic calcium channel blocker
Indications:	<ul style="list-style-type: none"> ➤ Torsades de Pointes (pulseless patient) ➤ VF or pulseless VT refractory to defibrillation (when lidocaine and amiodarone are contraindicated) <p>(EMT-3A – Medical Control order required for the following:)</p> <ul style="list-style-type: none"> ➤ Refractory asthma / allergic bronchospasm (MICP may administer initial dose without Medical Control order) ➤ Refractory seizures / pre-eclampsia / eclampsia ➤ Documented hypomagnesemia ➤ Torsades de Pointes (patient with pulses)
Precautions:	<p>Use with caution or not at all for the following:</p> <ul style="list-style-type: none"> ▫ Patient with renal insufficiency ▫ Patient with high degree AV block (2nd degree type II or 3rd degree)
Side effects:	<p>Hypotension Heart block / bradycardia Drowsiness or weakness Muscular paralysis CNS and respiratory depression</p>
Dose:	<p><u>VF or pulseless VT / Torsades de Pointes:</u> – 2 g slow IV/IO push</p> <p><u>Refractory asthma:</u> (per Medical Control Order – usual dose 2 g slow IV/IO over 20 min)</p> <p><u>Other indications:</u> (per Medical Control order – usual dose 1-2 g IV/IO over 5-20 min followed by re-assessment)^{1,2}</p>
Route:	IV/IO
Pedi Dose:	<p><u>Pulseless Torsades de Pointes:</u> 25-50 mg/kg slow IV/IO push (max dose 2 g)</p> <p><u>Other indications:</u> (per Medical Control order – usual dose 25-50 mg/kg over 10 -20 min)</p>
Notes:	<p>IV Magnesium can cause hypotension, dysrhythmias, and paralysis. Administration requires careful patient monitoring, including cardiac monitoring, and slow administration in patients with a perfusing rhythm. If bradycardia, heart block, hypotension, respiratory insufficiency or cardiac arrest develop during a magnesium sulfate drip, the drip must be turned off immediately. Reassess patient, provide supportive care, and contact Medical Control as soon as possible.</p> <p>Patients with eclampsia may require higher doses.</p>

Methylprednisolone (Solu-Medrol)

EMT-3A

- Action:** Corticosteroid with anti-inflammatory effects
- Indications:**
- Allergy/anaphylaxis
 - Upper airway edema (infectious or allergic)
 - Bronchial asthma
 - Acute exacerbations of COPD/emphysema
(Medical Control order required if pneumonia or sepsis suspected)
- Contraindication:**
- Known hypersensitivity to drug or components
- Precautions:** Use cautiously for patients with the following:
- Sepsis
 - Pneumonia
 - Infection
- Side effects:** There are many potential side effects, which become more significant with long-term use. These include: endocrine abnormalities, effects on wound healing, renal function, electrolyte balance, GI function, mental status, etc.
- Dose:** **125 mg** slow IV/IO over 1-2 minutes
- Route:** IV/IO
- Pedi dose:** **2 mg/kg** slow IV/IO over 1-2 minutes

Midazolam (Versed)

Action: Benzodiazepine that provides short-term CNS depression

- Indications:**
- Need for short acting sedation and amnesia prior to painful procedures (synchronized cardioversion / pacing)
 - Seizure/Eclampsia
 - Refractory nausea/vomiting (by Medical Control order)
 - Extreme anxiety/combativeness
 - Anti-shivering agent for post-arrest therapeutic hypothermia
 - ACS due to cocaine/amphetamine toxicity
 - Cocaine/amphetamine-caused dysrhythmia
 - Sedation after advanced airway placement
 - Thermal burn pain control

Contraindication: ▪ Hypersensitivity to drug or components

Precautions: Use with caution in the following patient categories:

- Hypotension (SBP <90)
- Pregnant patients
- Elderly patients
- Those with severe liver disease
- Those with renal failure
- Those with chronic heart failure
- *May potentiate the effects of other CNS depressants – be prepared for airway and management and BVM ventilation*

Side effects:

Retrograde amnesia	Euphoria	Confusion
Ataxia	Slurred speech	Paresthesia
Sedation	Hypotension	Tachycardia
Hives	Pruritis	Blurred vision
Nystagmus	Miosis	GI distress
Injection site irritation	Laryngospasm	Bronchospasm
Respiratory depression	Apnea	

Dose: Premedication, seizure/eclampsia or sedation – **2.5 mg** slow IV/IO (over 2 min), IM or IN (Repeat doses vary – see individual protocols)

Cocaine/amphetamine-induced ACS or dysrhythmia – **2.5 mg** slow IV/IO (over 2 minutes), IM or IN (Repeat doses vary – see individual protocols)

Thermal burn pain control (By Medical control order – usual dose **2.5 mg**)

Post-arrest therapeutic hypothermia – **0.05 mg/kg** slow IV/IO (over 2 minutes)
Maximum single dose 2.5 mg – adult & pediatric (Repeat same dose in 5 min if indicated and SBP >100)

Route: IV/IO, IM or IN

Pedi dose: Sedation: **0.05 mg/kg** slow IV/IO (over 2 minutes), IM or IN (max single dose 2.5 mg)
Seizure: **0.2 mg/kg** slow IV/IO (over 2 minutes), IM or IN (max single dose 5 mg)

Notes: IV/IO sedation is evident after 3-5 minutes
Sedation after IM injection usually occurs within 15 minutes

Morphine Sulfate

- Description:** Narcotic analgesic that decreases pain perception and anxiety as well as causing vasodilation
- Indications:**
- Residual discomfort after NTG for STEMI / new onset LBBB patients¹
 - Burn/frostbite pain
 - Acute isolated extremity trauma pain
 - Other types of pain (Medical Control order only)
 - Pediatric spinal cord injury (Medical Control order only)
- Contraindications:**
- Head injury / altered mental status (any etiology)
 - Undiagnosed abdominal pain/injury
 - Multiple trauma
 - COPD / compromised respirations
 - Hypotension (SBP <100)
 - Intoxication
 - Allergy to morphine
(allergy to other narcotics is a caution but not absolute contraindication)
- Precaution:**
- Use with caution for patient with known right ventricular infarction
- Side Effects:**
- | | |
|---|-----------------|
| Respiratory depression or arrest ² | Decreased LOC |
| Increased vagal tone (slowed heart rate) | Hypotension |
| Nausea/vomiting ³ | Pinpoint pupils |
| Increased cerebral blood flow | Urticaria |
- Dose:** **2-4 mg** slow IV/IO over 30 to 60 seconds – titrate to pain
(can repeat doses at 10 to 15 minute intervals if side effects do not occur – up to 10 mg total)
Exceed 10 mg by Medical Control order only⁴
- Route:** IV/IO or IM
- Pedi Dose:** By Medical Control order only for patients < age 6
0.1 mg/kg (usual dose – up to 4 mg max single dose)
- Pediatric pain control – patients ≥ age 6
0.1 mg/kg (usual dose – up to 4 mg max single dose)
- Pediatric spinal cord injury
(by Medical Control order – usual dose **0.1 mg/kg** up to 4mg max single dose)

Note 1: Morphine is indicated in STEMI and presumed new LBBB when chest discomfort continues after nitrates. Morphine should be used with caution for possible ACS without STEMI or presumed new LBBB. It may be used in this setting if the pain is severe, but should be withheld if the pain is mild.

Note 2: Have Narcan available before using morphine

Note 3: May administer ondansetron (Zofran) to patients receiving morphine to treat and prevent nausea/vomiting caused by morphine

Note 4: See Adult Trauma Section – Special Circumstances Pain Control

Naloxone (Narcan)

EMT-2

- Description:** Narcotic antagonist that reverses the effects of narcotics and synthetic narcotics by competing for opiate receptor sites
- Indications:**
- Suspected overdose with altered LOC and respiratory depression
 - Coma of unknown origin
 - Cardiac arrest due to narcotic OD (only after ROSC)
- Side Effects:** Narcotic withdrawal / seizure
Nausea/vomiting
Allergic reactions have been reported (rare)
- Dose:**
- 2 mg IV/IO** – titrate/repeat as needed to maintain respiratory effort/effect (some patients will require more than 2 mg – contact Medical Control if possible, but do not withhold if needed)
- 2 mg IN** – 1 mg per nostril (when IV unavailable)
- 2 mg IM** – into deltoid (if no change in LOC after 3-5 min, repeat 2 mg in opposite deltoid)
- Route:** IV/IO, IM or IN
(ET double dosage)
- Pedi Dose:** **0.1 mg/kg** (maximum single dose 2 mg)

Notes: Assist respirations/oxygenation prior to giving Narcan if respiratory depression is present.

Assess for and treat hypoglycemia prior to Narcan administration.

The half-life of Narcan is shorter than that of many narcotics, and repeat administration may be necessary in patients who respond transiently.

Nitroglycerin

EMT-1 may administer pt's own medication
 EMT-3 for ACS & cardiogenic pulmonary edema

Description: Vascular smooth muscle relaxant and systemic vasodilator that decreases myocardial workload and oxygen consumption

Indication:

- (EMT-3) Suspected ACS
- (EMT-3) Cardiogenic pulmonary edema due to heart failure

Contraindications:

- Hypotension (SBP <100)
- Heart rate **<50** or **>100** (when used for ACS)

Note: may be used for pulmonary edema even when heart rate is out of range, if the EKG shows a rhythm of sinus origin (for cardiogenic pulmonary edema, if a dysrhythmia exists, and the HR is <50 or >100 contact Medical Control, if feasible, as NTG can result in precipitous drops in BP – interventions to control rate may be a preferred option)
- Known acute RVI (right ventricular infarct)

Note: Do not delay NTG to obtain 12-lead EKG. If patient experiences hypotension, obtain 12-lead EKG as soon as possible to see if additional NTG is contraindicated.
- Use of Phosphodiesterase inhibitors for erectile dysfunction:

Within past 24 hours for sildenafil (Viagra, Revatio) or vardenafil (Levitra)
 Within past 48 hours for tadalafil (Cialis)
- **Note:** NTG is seldom required for patients < age 30 – consider Medical Control contact in such cases

Precautions: Use with caution for patients with:

- SBP <110
- Known aortic stenosis or known hypertrophic cardiomyopathy
- Suspected dehydration or volume depletion
- Known inferior AMI (for known inferior MI obtain a right-side EKG to assess for RVI ASAP – withhold NTG if RVI is suspected)

Note: consider establishing IV before using NTG in the above patient groups who are at risk to develop hypotension from NTG, and to require fluid resuscitation.

- Patients should be seated or lying down while receiving nitroglycerin

Side effects:

Hypotension	Headache
Facial flushing	Dizziness
Decreased LOC	

Dose: **0.4 mg** SL – titrate to pain, effect and SBP
 (may repeat at 3-5 minutes to 3 doses total – doses taken by patient do not count toward total)
 Contact Medical Control if more than 3 doses are needed

Route: Sublingual – spray or tablet

Notes: First dose may be administered prior to IV
 Establish vascular access as soon as possible
 Assess/record BP and patient response to NTG before and after each dose

Ondansetron (Zofran)

EMT-2

- Description:** Antiemetic
- Indications:**
- Treatment of nausea and vomiting
 - Prophylaxis for N/V prior to administering narcotic pain control
- Contraindication:**
- Known hypersensitivity to the drug
- Precaution:**
- May mask signs of closed head injury
(providers must be certain to report verbally, and in the PCR that the patient had complaint of nausea, and that ondansetron was administered in the field)
 - Known history of prolonged Q-T syndrome
- Side Effects:** Headache and dizziness are most common (<20% of patients)
Transient EKG changes, including Q-T interval prolongation
(occurs rarely / predominantly with IV ondansetron)
- Dose:** **4 mg** slow IV/IO over 2-5 minutes or IM
Repeat once in 10 minutes at same dose if nausea or vomiting persists
- Route:** IV/IO or IM (IV is the preferred route)
- Pedi Dose:** **0.1 mg/kg** IV/IO over 2-5 minutes or IM (maximum 4 mg per dose)

Notes: Ondansetron may not be effective in the cessation of active vomiting; however, the medication should not be withheld for this reason alone.

May administer to patients receiving morphine to treat and/or prevent nausea from morphine

Oral Glucose

ALL Levels

Description: Carbohydrate that raises blood glucose level

Indication: ➤ Symptomatic hypoglycemia

Precaution:

- Patient must be able to swallow if glucose is given PO
- Have suction available if given PO or buccally

Dose: **15 g** (unit dose – 1 tube glucose gel)

Route: PO or buccally (on oral mucosa) are usual routes

Note: Glucose gel is only given PO for a conscious patient who can protect their own airway. For a hypoglycemic patient with decreased LOC, consider applying small amounts of glucose to the oral mucosa (buccal administration) with the patient in the recovery position or administer rectally.

Pedi Dose: **15 g** (unit dose – 1 tube glucose gel)

Notes: Report and record BGL before and after administration

Patients who may need surgery ideally should have nothing by mouth; when possible attempt other methods to elevate blood sugar, but do not withhold oral glucose if needed in a symptomatic hypoglycemic patient.

Oxygen

ETT

Description: Odorless, tasteless, colorless gas that that is necessary for life – brought into the body via the respiratory system and delivered to each cell via the hemoglobin found in RBCs

Indications:

- Hypoxic patient
- Patient who may have increased oxygen demand for any reason

Precautions:

- Patients with Hx of COPD (however O₂ should not be withheld from any hypoxic patient or one who is in respiratory distress)
- In ROSC following cardiac arrest, excessive oxygenation has been associated with worse recovery outcomes – for these patients titrate oxygen delivery to obtain SpO₂ levels of 94-99%
- Excessive oxygen administration as well as hypoxemia can be detrimental to the newborn – for resuscitation of the newborn, initiate PPV with **room air** and add supplemental oxygen per newborn resuscitation algorithm (See OB/Gyn Section – Newborn Resuscitation)

Dose: Dependent on patient condition
1-15 lpm at 100%

Pedi Dose: Same as adult

Route: Inhaled, or delivered via the following:

- Non-rebreather mask (NRB)
- Nasal cannula
- Nebulizer
- Humidifier (aqua-pak)
- BVM
- Advanced airway
- CPAP

Phenylephrine HCl (Neo-synephrine nasal spray)

MICP only

Action: Topical vasoconstrictor

Indication: ➤ Pretreatment for nasotracheal intubation

Contraindications:

- Known hypersensitivity to the drug
- SBP >220 or DBP >110
- Known severe coronary artery disease
- Known use of MAOI (monoamine oxidase inhibitor) medication within 14 days prior

Side effect: Possible increased blood pressure

Dose: **3 sprays** to the nostril(s) prior to application of lubricating jelly

Route: IN

Pedi dose: See adult dosing for pt ≥ age12 (not indicated in children < age 12)

Sodium Bicarbonate

EMT-3A

Description:	Alkalotic agent that neutralizes acid in the blood – may help return pH to normal limits and decrease toxicity of certain medications
Indications:	(EMT-3A per standing order for the following indications) <ul style="list-style-type: none"> ➤ PEA due to suspected metabolic acidosis ➤ Cardiac arrest following Tricyclic Antidepressant (TCA) or cocaine OD (EMT-3A per Medical Control order for the following indications) <ul style="list-style-type: none"> ➤ <u>Unstable</u> cardiac dysrhythmias following a TCA or cocaine overdose (obtain Medical Control order – however, if delay in contacting Medical Control is potentially detrimental to a critical patient, administer Sodium Bicarbonate and contact Medical Control as soon as feasible) ➤ Seizures or <u>stable</u> cardiac dysrhythmias following TCA or cocaine OD (by Medical Control order only) ➤ Known or suspected hyperkalemia (by Medical Control order only) ➤ Known or suspected rhabdomyolysis (by Medical Control order only)
Contraindication:	▪ Respiratory acidosis
Precautions:	<ul style="list-style-type: none"> ▫ May react with other medications (flush IV line well before and after administering – consider establishing a second IV for Sodium Bicarbonate use) ▫ May cause fluid retention ▫ May worsen cardiogenic pulmonary edema / heart failure
Side effects:	Metabolic alkalosis lowers K ⁺ which may increase cardiac irritability Worsens respiratory acidosis if ventilation is inadequate
Dose:	1 mEq/kg up to one preload (50 mEq) Repeat only by Medical Control order
Route:	IV/IO push in arrest Slow IV/IO over 1 to 5 minutes in perfusing rhythms
Pedi Dose:	Same as adult dose

Tylenol (acetaminophen)
(Tablets & Solution)

- Description:** Antipyretic
- Indication:** Fever due to suspected infection with temperature greater than 101° F
- Contraindications:** Known hypersensitivity or allergy to the drug
Fever due to other than suspected infection
Patient has received acetaminophen or other antipyretic within the immediate preceding 4 hours (on standing orders)
Patient is unable to safely ingest oral medications
Patient who may be in need of immediate surgery
Suspected liver dysfunction
- Precautions:** Renal dialysis patients
Patient too dyspneic to safely swallow
- Side effects:** Acetaminophen toxicity resulting in liver failure
Allergic reaction
- Dose:** **500 mg** (patient < 150 lbs)
1000 mg (patient ≥ 150 lbs)
Note: Dosing must not exceed 15 mg/kg
- Route:** PO
- Pedi dose:** Usual dose **is 15 mg/kg PO** (maximum single dose 500 mg)

Back Cover