Wichita-Sedgwick County EMS System Medical Protocols

Reviewed and Approved by the Medical Society of Sedgwick County

Published July 2012
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Thanks . . .
. . . to the Provider Advisory Council for their engaged participation in this task . . . which took way longer than anyone thought it would, especially me.
. . . to other EMS systems and medical directors who shared their protocols, especially

- Dr. Jeff Beeson and Medstar, Fort Worth, Texas
- Dr. Paul Hinchey and Austin-Travis County Office of the Medical Director, Texas
- Dr. Joe Holley and Memphis Fire Department, Tennessee
- Dr. Lester Richardson and Johnson County MedACT, Kansas
- Dr. Allen Yee and Chesterfield Fire Department, Virginia
- Albemarle County Fire Rescue, Charlottesville, Virginia

. . . to all the EMSS providers who gave thoughtful and constructive input into creating these protocols.
. . . to the Medical Society of Sedgwick County Physicians Advisory Council and Board of Directors for their review of and input to these protocols as well as their ongoing strong support of WSC EMSS agencies, providers, and providing the highest level of emergency care to our patients.

INTRODUCTION

This edition of the Wichita-Sedgwick County EMS System protocols represents a significant change in format and approach. Please take the time to read the introductory materials as they are important to provide context and set the stage for the protocols themselves.

Authority:

This document represents medical care protocols, approved by the Medical Society of Sedgwick County in accordance with Kansas statutes. Wichita-Sedgwick County EMS System (WSC EMSS) providers will operate in accordance with these protocols under the medical oversight of the EMS System Medical Director. EMS providers act under the delegated practice of the medical advisor. All medical practice within WSC EMSS is performed at the discretion of the Medical Director or her designee. All providers operating under these protocols must have current certification in the state of Kansas. Advanced Life Support (ALS) Providers with SCEMS must be in good standing, and ALS Providers in first response agencies must be currently fully credentialed in order to utilize these guidelines to their level of certification. These protocols are for use by all Basic Life Support providers to their level of current certification. Both Advanced EMT and Paramedic are considered ALS providers with scope of practice as specified.

Scope of the Protocols:

Every effort has been made to include guidance for treatment of the majority of emergencies, however due to the nature and scope of EMS, it cannot be comprehensive. These protocols should be considered procedural rules, and thus the decision to diverge from the protocols must be carefully weighed to assure that the benefit outweighs the risk. You may need to consult the Medical Director or online medical command for guidance in these cases. If you feel protocol deviation is necessary, you should make every effort to do so in conjunction with the EMS Ops Captain, and/or EMSS Medical Director, and/or on line medical command. If this is not practical during the call itself, you should report protocol divergence to the EMS Ops and Education/QI Captain (and the Fire Medical Training Officer if applicable) and Medical Director as soon as possible.

General Philosophy:

Overall, the protocols are designed in many ways for increased patient safety and increased consistency. The protocols provide job aids and decision support tools to limit the opportunity for medication administration errors, to support quality and complete documentation, and overall to promote quality patient care. The goal is to provide procedural rules that support quality patient care and delineating what is acceptable practice.

There are significantly fewer individual protocols than in the most recent (2009) version of the protocols. These protocols are specifically written to allow a stepwise, assessment-based approach to patient management which addresses the vast majority of emergent complaints you will encounter. They are also written to provide you greater latitude to exercise your clinical judgment when appropriate, but are dependent on the EMS provider

adopting a critical thinking approach to each patient encounter. Every patient intervention should be based on an assessment that supports the patient's need for it, and its effect evaluated by reassessment following the intervention. Patient care documentation should reflect both these assessment findings and the decision-making process that led to the intervention (or decision not to intervene). Keep in mind that just because a protocol exists for a specific problem does not necessarily mean that an individual patient will benefit from application of that protocol.

It is important to note that these protocols will be a living document, rather than a static one. Providers' input is welcomed at all times as we implement and use these guidelines. Although a huge amount of time (and input) went in to creating this document, some things may be confusing or misleading initially and need to be reformatted or reworded. Updates should be expected fairly frequently. These will keep our protocols current, user-friendly, and in keeping with best practices, current research, and current thinking on out-of-hospital care. Quarterly meetings with the Medical Society of Sedgwick County PAC will allow timely updating of protocols in an ongoing fashion rather than complete intermittent overhaul. Because of the dynamic nature of the protocols going forward, this will be the last edition of the protocols that will be provided by WSC EMSS in printed format. Updates will be distributed to WSC EMSS agencies through electronic mechanisms and the most current version of each protocol will be available on the WSC EMSS Moodle website (www.wscomd.net). Individual agencies will be responsible for determining the best way to distribute protocols and updates to their providers. EMSS is also planning to make the protocols available in App format for Droid and iPhone at no cost to the provider. Updates will be posted to the App just as they will to Moodle, so the App will be current as well. If you have a smartphone, you will have that option, and should also strongly consider utilizing other electronic support information such as current drug information and interaction information (i.e. Epocrates), drip calculation software, and other available information to improve medication administration accuracy and patient safety.

I hope these protocols provide the basis for moving our system forward and provide you greater capacity to both act as the healthcare professionals you are, but also to provide excellent, current, safe care to patients in Wichita and Sedgwick County.

PROTOCOL STRUCTURE OVERVIEW

Wichita-Sedgwick County EMS System v1.1 7-1-13 Effective 7-1-2012

General Approach:

Every intervention should be preceded and supported by an appropriate assessment. This document and every patient encounter should start with use of the **GENERAL ASSESSMENT Protocol,** either adult or pediatric. Additional detail on information to include in these assessments and in your documentation can be found in the **ASSESSMENT Procedure**. Based on your findings there, you will bridge to specific protocols. You may only need the interventions provided for in the **GENERAL ASSESSMENT Protocol** for a significant number of patients. This structure helps eliminate some of the repetitiveness of the previous format, particularly with regard to basic assessment and care measures that should be provided for nearly every patient (i.e. vital signs, airway assessment and oxygen if indicated). You will notice that the pediatric assessment does not include blood pressure, since that is notoriously inaccurate, and decision-making is actually based on heart rate and perfusion status, not blood pressure.

The **GENERAL** and **TRAUMA ASSESSMENT Protocols** incorporate a structured assessment plan that allows you the flexibility to perform specific skills and apply monitoring equipment as dictated by your assessment, rather than having to go to a specific protocol to do so. The **ASSESSMENT Procedure** also includes cues to assist you in your patient care documentation record with appropriate (but not all-encompassing) pertinent positives and negatives. Based on your findings from these **ASSESSMENTS**, you can then move to the appropriate specific protocols, if needed, to continue care of specific problems.

As previously noted, not every eventuality is included in the protocols, and if you feel you have a special case, you always have the option of discussing your assessment and proposed plan with the Medical Director or with online medical command at the receiving facility for potential orders.

Each protocol makes the following assumptions:

1. Patient has been asked and **IS NOT** allergic to any medication / medication class being given.
2. Intravenous (IV) and Intraosseous (IO) administration are considered to be equivalent and thus IO is not separately noted. See **VASCULAR ACCESS Procedure** for further specifics.
3. All equipment appropriate to the type of call and prearrival information will be taken to the patient at the time of initial contact for appropriate and efficient assessment, treatment and transport.

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Each protocol is formatted as a flowchart. Many protocols apply to both adult and pediatric patients, some are only for adult or only for pediatrics.

Effort has been made to be consistent throughout the protocols. For example, pediatric is considered age birth-8 year old, adult hypotension is SBP < 90 mmHg; adult tachycardia is P > 110, hypoxia is pulse ox < 94%. Whenever possible, medication doses are consistent throughout the protocols (magnesium sulfate starts with 2 grams IV), and are given as a specific dose rather than a dose range.

All medication names in the protocols are generic, and providers should refer to them by these names at all times to avoid confusion and potential medication errors.

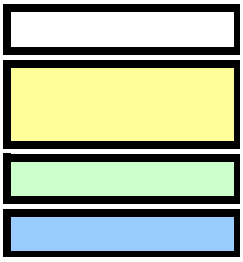
Color cues give guidance on what each box includes and what provider type it applies to. See below for specifics.

Information

Primary medication (backup medication options in white box)

Options based on assessment

Decision point



Provider level:

Refers to the level the provider is currently certified at in the state of Kansas.

E = Emergency Medical Technician (EMT): Basic Life Support provider

A = Advanced EMT (this is not interchangeable with EMT-Intermediate): Advanced Life Support provider

P = Paramedic : Advanced Life Support provider

M = Requires physician order through medical command, either via medical director consult or online medical direction with receiving hospital

For AEMT and Paramedic, it refers to all providers with SCEMS, and all credentialed providers with WSC EMSS first response agencies who may have ALS equipment and medications available to them.

PROTOCOL STRUCTURE OVERVIEW

Medication and intervention dosing

Because there are ongoing and chronic shortages of multiple emergency medications, we are making every effort to maintain supplies of consistent concentrations of essential emergency medications. However, we suspect there will come a time that some medications may need to be substituted, so we have gone ahead and included the expected substitute medication in the protocols.
This applies to opioid analgesia, where Fentanyl is the primary medication and Morphine will be the backup if Fentanyl becomes unavailable. It also applies to benzodiazepines, where Midazolam is the primary medication and Lorazepam will be the backup if Midazolam becomes unavailable.

The bottom of each protocol (or facing page) includes special medication dosing and intervention applicability for pediatric and geriatric (including any age end-stage renal and liver) patients. In some cases, if there is weight-based variability in dosing for adults, a 50kg and 75kg+ option are included.

Pediatrics = up to 40 kg or up to 8 years old
Geriatrics = 65 years old or more. These reduced medication dosages also apply to patients at any age with renal disease (i.e. on dialysis or diagnosis of chronic renal insufficiency) or hepatic disease (i.e. severe cirrhosis or endstage liver disease)

The pediatric colors correspond to the length-based resuscitation tape color scheme. The dose noted in the box is specified in mg, not in fluid amounts to assure dosing accuracy even if different formulations of a drug are provided in the drug box. Each column defines a range. Each column applies to all patients up to the next noted weight (i.e. 5-6kg, 40-49 kg).

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	75 kg	Geriatric
Adenosine--first dose IV	0.5 mg	0.7 mg	0.9 mg	1 mg	1.2 mg	1.5 mg	2 mg	3 mg	4 mg	6 mg	6 mg	6 mg
Dextrose IV	2 gm	3.5 gm	4.5 gm	5 gm	6 gm	8 gm	10 gm	15 gm	20 gm	25 gm	25 gm	25 gm
Dextrose 50% (ml) IV	4 ml	7 ml	9 ml	10 ml	12 ml	15 ml	20 ml	30 ml	40 ml	50 ml	50 ml	50 ml
Fentanyl IV / IM				10 mcg	10 mcg	15 mcg	20 mcg	25 mcg	25 mcg	50 mcg	75 mcg	25 mcg
Fentanyl IN	10 mcg	15 mcg	20 mcg	20 mcg	25 mcg	30 mcg	40 mcg	50 mcg	50 mcg	100 mcg	150 mcg	50 mcg
Hydroxocobalamin IV	350 mg	500 mg	650 mg	700 mg	850 mg	1050 mg	1400 mg	2100 mg	2800 mg	5 g	5 g	5 g
Prednisone PO							20 mg	20 mg	40 mg	60 mg	60 mg	60 mg

For some medications, the ml amount is also provided with the mg amount—for example Dextrose dilutions, and the amount of Magnesium sulfate 50% to add to provide the proper 10% dilution, as well as the proper ml of the 10% dilution. If a box is blacked out, you **may not** give this medication to this age group without specific orders from medical command. There are exceedingly rare cases where medical command may elect to give you orders for this medication/age group, but it is unlikely. Specifically for Hydroxocobalamin, the doses remain visible in the blacked out box, so if you call to request orders, you will know the proper dose to request, as this is rarely given even in the ED. So a black box means one of the following:

- the medication should not be given in this age group. For example, Dextrose 50% should **never** be given to infants, it should be diluted to Dextrose 10-12.5%.

OR

- you should be thinking of other reasons the patient is exhibiting the symptoms for which the medication may be indicated. For example, you should not be thinking first of giving atropine to a pediatric patient with bradycardia, but rather adequate oxygenation, proper airway management, and other resuscitative measures.

OR

- you need to get an order from online medical command for the med, but the dose to request is provided. This is not true for all blacked-out boxes.

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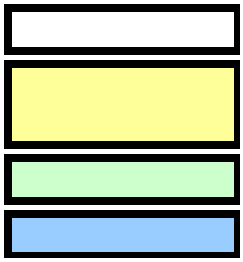

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OR

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GENERAL ASSESSMENT: PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

V1.1 (1-1-13)

A - 1

Effective 7-1-2012

Scene / Crew Safety / PPE
Appropriate equipment
to patient based on
prearrival information

↓

Initial Assessment / Physical Exam
Pediatric Assessment Triangle

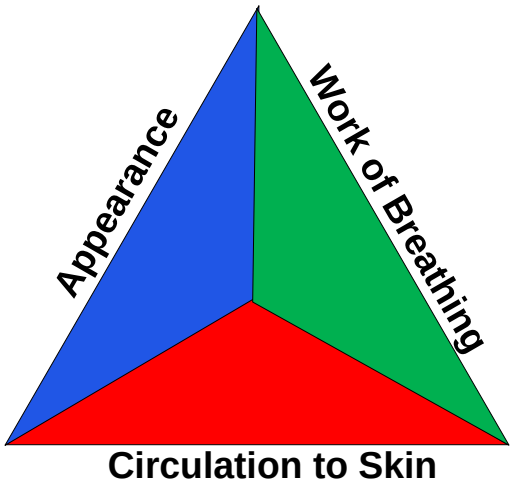
↓

If heart rate < 60 go to
CARDIAC ARREST: PEDIATRIC
(MC – 4) Protocol

↓

Vital Signs: Pulse, RR, cap refill, breath sounds
every 15 minutes,
more frequently on critical patient.
BP is optional, consider if critical.

GCS, Temp if indicated
Pulse ox, ETCO2, 12-lead and other
monitoring as appropriate



→ Apply length-based
resuscitation tape
for any critical (red) patient < 8yo

↓

OPTIONS BASED ON ASSESSMENT

E	**AIRWAY MANAGEMENT Procedure (P – 10)**
	12-LEAD ECG Procedure (P – 5)
E	**GLUCOSE ASSESSMENT Procedure (P – 4)**
	SPINAL MOTION RESTRICTION Procedure (P – 22)
	WAVEFORM CAPNOGRAPHY Assessment Procedure (P – 7)

E	**CARBON MONOXIDE Assessment Procedure (P – 8)**
	CARDIAC RHYTHM MONITORING Procedure (P – 6)
A	**VASCULAR ACCESS Procedure(P – 40)**
	FLUID RESUSCITATION Procedure(P – 42)

↓

Appropriate Medical or Trauma
Protocol

↓

M	Contact Medical Command if other orders required

Scene / Crew Safety / PPE
Appropriate equipment
to patient based on
prearrival information

↓

Initial Assessment / Physical Exam

↓

Vital Signs: BP, Pulse, RR, Oxygen saturation, Pain scale
every 15 minutes,
more frequently on critical patient

GCS, Cap refill, Temp, ETCO2, 12-lead ECG, breath sounds, neurovascular assessment and other monitoring as appropriate

↓

OPTIONS BASED ON ASSESSMENT

E

- **AIRWAY MANAGEMENT Procedure (P – 10)**
- **12-LEAD ECG Procedure (P – 5)**
- **GLUCOSE ASSESSMENT Procedure (P – 4)**
- **SPINAL MOTION RESTRICTION Protocol (P – 22)**
- **CARBON MONOXIDE Assessment Procedure (P – 8)**
- **WAVEFORM CAPNOGRAPHY Assessment Procedure (P – 7)**

A

- **CARDIAC RHYTHM MONITORING Procedure (P – 6)**
- **VASCULAR ACCESS Procedure (P – 40)**
- **FLUID RESUSCITATION Procedure (P – 42)**

↓

Appropriate Medical or Trauma Protocol

↓

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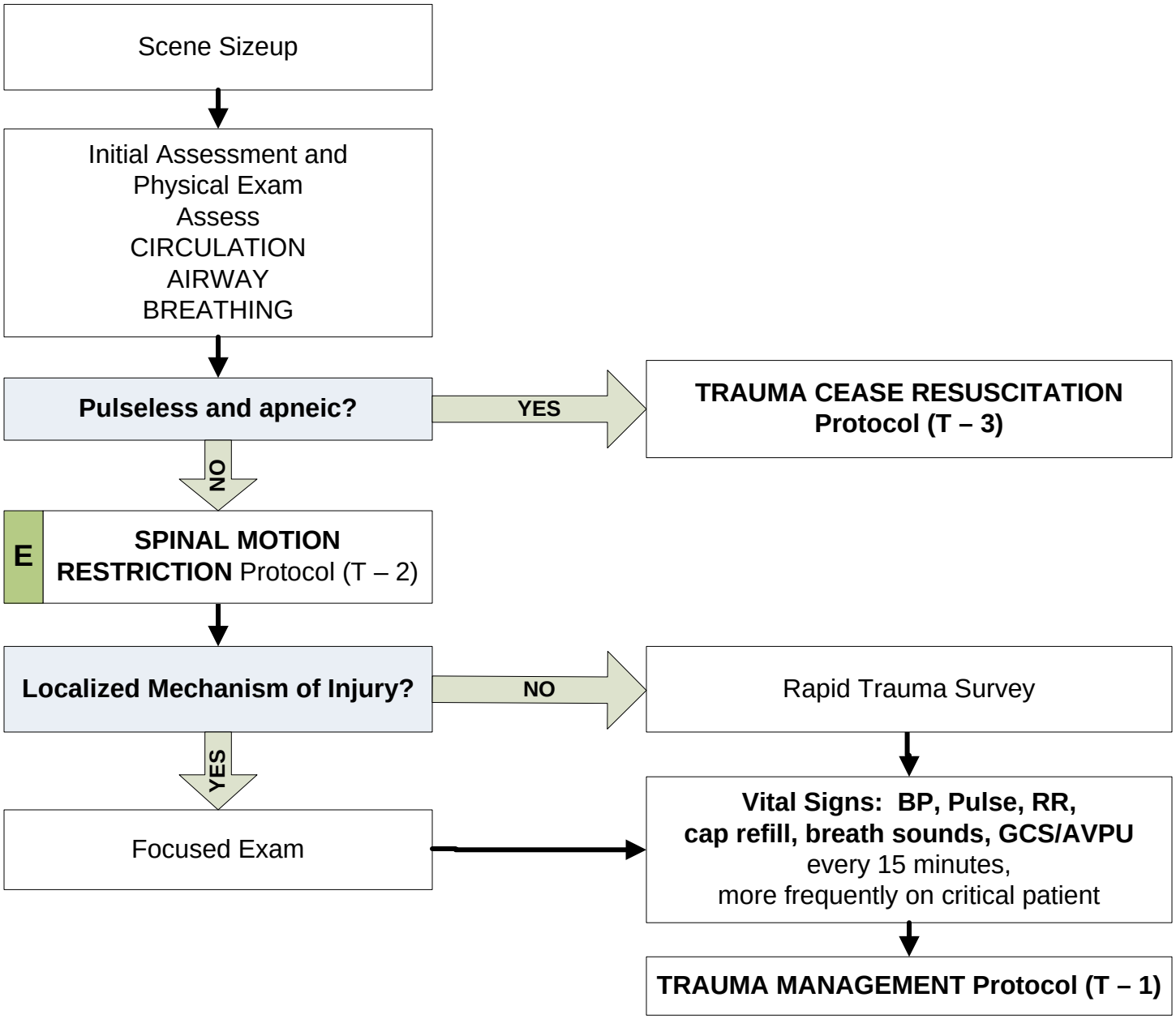


OPTIONS BASED ON ASSESSMENT

E	**AIRWAY MANAGEMENT Procedure (P – 10)**
E	**12-LEAD ECG Procedure (P – 5)**
E	**GLUCOSE ASSESSMENT Procedure (P – 4)**
E	**WAVEFORM CAPNOGRAPHY Assessment Procedure (P – 7)**
E	**CARBON MONOXIDE ASSESSMENT Procedure (P – 8): Consider for any enclosed space burn or inhalation injury**
A	**CARDIAC RHYTHM MONITORING Procedure (P – 6)**
A	**VASCULAR ACCESS Procedure (P – 40): Use warm IV fluids unless patient hyperthermic**

Code Blue: Cardiac or respiratory arrest

Code Red: Patient with critical or serious hemodynamic, physiologic, or mental status changes or a significant expectation that patient will acutely decompensate in the short term.

These may include:

- LOC less than Verbal, or acute GCS < 14
- STEMI on 12-lead ECG
- Suspected Stroke with ≤ 5 hours since last seen normal
- High-risk or complicated obstetric patient > 20 weeks gestation
- Newborn with APGAR score ≤ 7 at 5 minutes
- Trauma (requires level 1 trauma center):
    - Physiologic: any of the following:
        - GCS < 14
        - SBP < 90 mmHg, or signs of shock
        - Respiratory rate < 10 or > 29 or need for respiratory support
    - Mechanism:
        - Penetrating injury to head, neck, torso, or extremities proximal to knee or elbow
    - Burns (to burn center)
        - Partial-thickness burns greater than 10% of the total body surface area
        - On face, hands, feet, genitalia, perineum, or crossing major joints
        - Third-degree burns in any age group
        - Electrical burns, including lightning injury
        - Chemical burns
        - Inhalation injury
        - Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality
        - Any patients with burns and concomitant trauma
    - Note: For patients who may have minor injuries that technically fall into the red trauma category as noted above, providers may call receiving facility to clarify the extent of patient injury so the facility can respond appropriately. For example, a quarter-sized chemical burn to the hand technically is a red trauma, but the additional information will help the facility match the appropriate level of response to the patient's needs.

Code Yellow: Patient with currently non-critical, though potentially serious hemodynamic, physiologic, or mental status changes with potential for decompensation in the short term.

These may include:

- Patient requiring advanced emergency care management (such as medication therapy, monitoring, noninvasive airway management)
- LOC of Verbal (or change from baseline LOC), acute GCS 14-15
- Suspected cardiac chest pain without STEMI on 12-lead ECG
- Suspected stroke with > 5 hours since last seen normal
- Potentially toxic ingestion
- Obstetric patients with impending delivery or uncomplicated field delivery
- Obstetric patient ≥ 20 weeks gestation complaining of abdominal and/or back pain following blunt trauma
- Newborn with APGAR ≥ 8
- Potential long bone fracture
- Trauma (require level 1 trauma center):
    - Mechanism:
        - Fall:
            - adult > 20 feet
            - child > 10 feet or 3 x height of child
        - High risk auto crash
            - ejection (partial or complete) from automobile
            - death in same passenger compartment
        - Auto vs. pedestrian or bicyclist thrown, run over, or with > 20mph impact
        - Motorcycle crash > 20 mph
    - Physical findings
        - Chest wall instability, deformity, or significant focal bony tenderness
        - Significant abdominal pain, tenderness, or bruising (i.e. seatbelt sign) related to acute traumatic event
        - Two or more proximal long-bone fractures
        - Amputation proximal to wrist or ankle
        - Pelvic fracture
        - Open or depressed skull fracture
        - Paralysis or new neuro deficit
- Trauma (does not require Level 1 trauma center): patients who do NOT meet any of the criteria for transport to level 1 trauma center. The following are specifically included in this category, though other trauma may fit this category as well (i.e. isolated long bone fracture).
    - Fall:
        - adult > 55 years old on anticoagulant therapy (any anticoagulant except aspirin) with normal GCS and baseline neuro exam

- High risk auto crash:
  - intrusion > 12 inches at occupant location
  - intrusion > 18 inches at any location
- Burn
  - Not meeting Code Red criteria

Code Green: Patient who has normal hemodynamics, normal respiratory status, and normal mental status and is not reasonably expected to become unstable in the short term.

This implies:

- Vital signs within normal limits for age
- Patient does not require advanced emergency care management
- Patient is alert and fully oriented (or at baseline mental status)

Triage green patient may be transported to a Sedgwick County hospital of the patient's choice, or as requested by the patient's legal decisionmaker.

Code Orange: This code implies that no emergency medical treatment is required to manage patient, their complaints are strictly behavioral, and there are no active medical issues. Great caution should be used before using this code for elderly / geriatric patients with altered mental status / confusion / combativeness as these are often organic / medical in origin unless patient has a clear prior history of same due to psychiatric causes such as dementia. If in doubt, the **ALTERED MENTAL STATUS Protocol (M-1)** should preferentially be applied to combative geriatric patients. Appropriate examples may include:

- Suicidal thoughts
- Psychiatric medication noncompliance

We plan to discontinue the use of this category for EMS patients. Patients with strictly behavioral complaints as above and stable chronic medical problems (i.e. seizure disorder without active seizure) do not require EMS assessment unless specifically requested by law enforcement. If EMS is called, medical assessment or management is required, and the patient should be triaged red-yellow-green as appropriate. If medication management is required to calm or protect patient, they are at minimum Code Yellow.

Code Black: If patient meets criteria as described in **MEDICAL CEASE RESUSCITATION Protocol (MC – 9), DETERMINATION OF DEATH – MEDICAL Procedure (P-51), TRAUMA CEASE RESUSCITATION Protocol (T -3)**, or **DETERMINATION OF DEATH –TRAUMA Procedure (P-52)** resuscitation may be discontinued or not initiated by standing order. Deceased patients will not be transported by EMS.

Physician Determined: Other resuscitation situations may be discussed with the EMSS Medical Director for consideration of cease resuscitation. These situations should be rare, and thus should only be discussed with an ED physician if the EMSS Medical Director is unavailable.

The following protocols provide general rules for establishing hospital destinations for patients transported by EMS. These rules are based, in part, on Sedgwick County Resolution #13-2007 and City of Wichita Ordinance #3-80-270 and protocols established by the MSSC.
Transports from scenes located within Sedgwick County are to be performed in accordance with the latest amended version of these protocols outlined under this **HOSPITAL DESTINATION Protocol** (A – 5) section.
Non-routine factors, such as poor road/weather conditions, diversion status of hospitals, number of patients requiring transport, etc., may alter how these protocols are followed.
911 patients will only be transported to 24/7 physician staffed Emergency Departments unless specifically authorized on a case-by-case basis by the EMSS Medical Director.

- Transports to facilities outside Sedgwick County will only be considered for stable patients not meeting clinical criteria for transportation to a specialty center.
- For continuity of care, patients who have been evaluated and/or treated at a hospital within the preceding 72 hours will be transported to that facility unless they meet clinical criteria for transportation to a specialty center.
- As a general rule, patients should stay within the healthcare system where they receive all their care. Therefore, if a hospital is on divert or redirect, the patient should preferentially be taken to another facility within that system that can meet their needs as noted below.

<u>Specialty center destinations:</u>

- Trauma Center destination
    - Adult Blue or Red patients will be transported to the closest ACS-verified level 1 adult center (Via Christi St Francis or Wesley).
        - Blue or Red adult patients East of I-135 or I-35 (south of 47th St South) will be transported to Wesley Medical Center – Level I Trauma Center
        - Blue or Red adult patients West of I-135 or I-35 (south of 47th St South) will be transported to Via Christi St Francis Campus – Level I Trauma Center.
    - Adult Yellow patients may be transported to the trauma center of their choice
    - Trauma patients ≤ 14 years of age, triaged Blue, Red and Yellow, will be transported to an ACS Designated Pediatric Trauma Center (Wesley Medical Center – Main Campus). ***See section below regarding burns***
    - Medical direction at the receiving hospital can be consulted to request upgrade if provider judgment is that patient has potential for significant injury—this is especially true of elderly patients (and more likely the older the patient is with what appears to be insignificant mechanism)
        - SBP < 110 may represent shock after age 65
        - Low-impact mechanism (i.e. ground-level falls, minor MVC) may result in severe injury in the elderly (>55 years old)

- Only four (4) Trauma Alert patients from a single incident shall be taken to the same Trauma Center. The fifth (5) and/or additional Trauma Alert patient(s) shall be taken to another Trauma Center in accordance with current patient destination and/or diversion protocols. When patients ≤ 14 years of age are involved in a multiple casualty event, efforts should be made to preferentially direct pediatric patients to a pediatric trauma center.
- Burn center destination
    - Code Red or Yellow patients with burns will be transported to the closest designated burn center, Via Christi St Francis
    - Burn patients with associated blunt or penetrating trauma will be transported to Via Christi St Francis. When significant burns and trauma are simultaneously present in a patient ≤ 14 years of age, the on-scene providers will use their judgment regarding best destination (Via Christi Burn Center or Wesley Pediatric Trauma Center).
- Stroke Center destination
    - Patients with possible acute stroke less than 6 hours since time last seen normal will be transported to the closest Joint Commission certified stroke center (Via Christi St Francis or Wesley). This should either be the facility where the patient usually receives their care, or the closest stroke center if that information is not known.
    - Large Vessel Occlusion Strokes will be preferentially transported to Via Christi St Francis, unless patient preference is to be transported to Wesley Medical Center.
- STEMI Center destination
    - Patients with STEMI on EMS 12 lead will be transported to the closest hospital with 24 hour cardiac cath lab capability (Via Christi St Francis, or Wesley). This should either be the facility where the patient usually receives their care, or the closest STEMI center if that information is not known. If the patient has an established relationship with a cardiology group at one of these facilities, the patient may be transported to that facility provided there is no more than 10 minute time difference in transport. Although still recommended, this destination policy does not apply to physician – to – physician interfacility transfers where a physician is in attendance with the patient on scene.
- Resuscitation Center destination
    - Patients with ROSC post- arrest will be transported to a resuscitation center (Via Christi St Francis or Wesley) which offers 24 hour cardiac cath lab capability and potential access to therapeutic hypothermia and comprehensive post-resuscitative care for appropriate patients. This should either be the facility where the patient usually receives their care, or the closest resuscitation center if that information is not known.
    - Adult or pediatric patients in ongoing medical cardiac arrest should be transported to the closest hospital-based emergency department (i.e. any hospital except Wesley West)

- Rapid Fetal Assessment destination
    - Obstetric patients ≥ 20 weeks gestation complaining of abdominal and/or back pain following blunt trauma, OR meeting code red or blue criteria will be transported to Wesley

- Obstetric patient destination
    - Obstetric patients ≥20 week gestation) in suspected labor or with obstetric-related complaints should be transported to the Sedgwick County hospital where they planned to deliver.
        - If patient does not have a usual hospital for their obstetric care, they will be transported to either Via Christi St Joseph or Wesley
    - Obstetric patients (≥ 20 weeks) in medical cardiac arrest will be transported to Via Christi St Joseph or Wesley
    - Obstetric patients (≥ 20 weeks) in traumatic cardiac arrest will be transported to Wesley
    - Pre-viable (<20 week) gestation patients with obstetric complaints may be transported to any emergency department for evaluation.
- Since all eventualities cannot be covered in the above guidance, if there is uncertainty about which hospital can offer the most appropriate care for a complex patient's specific situation that is not covered above, please consult either a Division Leader and/or the proposed receiving ED to discuss where the patient's medical needs can best be met.

ACUTE CORONARY SYNDROME: ADULT MEDICAL PROTOCOL

Medical Society of Sedgwick County

V 1.1 (12-1-14)

MC - 1

Effective 7-1-2012

ADULT ASSESSMENT Protocol (A – 2)

Suspected ischemic chest pain or ischemic equivalent?

NO → Evaluate for non-cardiac causes of chest pain

YES

E **ASPIRIN** 324 mg po chewed

12 lead ECG (when available): **STEMI**?

NO

YES

Call EMS STEMI Alert ASAP

Place defib pads

STEMI Alert Information:
Name of cardiologist or
if Via Christi Clinic patient

Inferior STEMI?
(Elevation in II, III, aVF)

NO → **E** **NITROGLYCERIN** 0.4 mg SL
May repeat every 3 min if needed for ongoing chest pain if SBP >90
Patient must deny use of any erectile dysfunction or pulmonary hypertension drug within the last 48 hr

YES

If SBP ≤ 90: administer fluid bolus 250-500cc
If SBP >90 to120, consider bolus

Pain resolved or improved with 3 or more SLNTG?

NO → **A** **FENTANYL IV / IM / IN**
May repeat x 1 in 5 min if needed for ongoing chest pain if SBP >90

YES

P **NITROGLYCERIN 2% ointment**
1 inch topical if SBP >90

Monitor pain scale
Repeat 12 lead ECG if resolution of or increase in pain

	50-74 kg	≥75 kg	Geriatric
Fentanyl IV / IM	**50 mcg**	**75 mcg**	**25 mcg**
Fentanyl IN	**100 mcg**	**100 mcg**	**50 mcg**

BRADYCARDIA: ADULT MEDICAL PROTOCOL

Medical Society of Sedgwick County

V 3.3 (10/19/2018)

MC - 2

Effective 10-1-2016

ADULT ASSESSMENT Protocol (A – 2)

HR < 50?

NO → Monitor, reassess for development of symptoms

YES

Perform 12 lead ECG

SEVERE symptoms / unstable?

Signs of inadequate perfusion DUE TO bradycardia: Hypotension/shock, altered mental status, ischemic chest pain, new/worsened CHF

NO → Monitor, reassess for development of symptoms

YES

STEMI, High Grade Block, or Heart Transplant?

NO → P **ATROPINE** 0.5 mg IV May repeat x 1

INEFFECTIVE

EFFECTIVE

YES

OPTIONS BASED ASSESSMENT

P

Consider Sedation

- **MIDAZOLAM IV / IM / IN** May repeat x 1 in 5 minutes
- **LORAZEPAM IV / IM** May repeat x 1 in 5 minutes
- **KETAMINE IV / IM** May repeat x 1 in 5 – 10 minutes

Consider Analgesia

- **FENTANYL IV / IM / IN** May repeat x 1 in 5 minutes
- **MORPHINE IV / IM** May repeat x 1 in 5 minutes

TRANSCUTANEOUS PACING Procedure → EFFECTIVE

INEFFECTIVE

P **Push pressor EPINEPHRINE:** 10 mcg bolus (1 mL of 1:100,000 concentration) every 3-5 minutes

	50-74 kg	75-90 kg	>90 kg	Geriatric
Dopamine gtt (mcg/min) IV- starting dose 5 mcg/kg/min	**250 mcg/min**	**375 mcg/min**	**450 mcg/min**	**250 mcg/min**
Fentanyl IV / IM	**50 mcg**	**75 mcg**	**75 mcg**	**25 mcg**
Fentanyl IN	**100 mcg**	**100 mcg**	**100 mcg**	**50 mcg**
Ketamine IM	**150-300 mg**	**200-400 mg**	**250-500 mg**	**M**
Ketamine IV	**75-150 mg**	**100-200 mg**	**125-250 mg**	**M**
Lorazepam IV / IM	**2 mg**	**2 mg**	**2 mg**	**1 mg**
Midazolam IV	**2.5 mg**	**5 mg**	**5 mg**	**2.5 mg**
Midazolam IM / IN	**5 mg**	**10 mg**	**10 mg**	**5 mg**

Monitor, reassess for development of symptoms

Draw up 1 mL of cardiac epinephrine and add to 9 mL of saline for push pressor concentration

Alternately, add 1 mL of 1:1000 epinephrine to a 100 mL bag of saline for same concentration of push pressor epi.

TACHYCARDIA: ADULT MEDICAL PROTOCOL

Medical Society of Sedgwick County

V 3.2 (7-24-2017)

MC - 3

Effective 10-1-2016

ADULT ASSESSMENT
Protocol (A – 2)

Heart rate ≥ 150 AND symptomatic due to increased heart rate?

NO → Evaluate for and treat underlying causes: fever, hypovolemia, sepsis

SEVERE symptoms / unstable?
Inadequate perfusion **due to tachycardia**: Hypotension / shock, altered mental status, ischemic chest pain, new / worsened CHF

NO → **QRS wide?**

NO → **Valsalva maneuver effective?**

NO →

NARROW COMPLEX REGULAR RHYTHM

P: **ADENOSINE** 6 mg IV rapid IVP
May repeat **ADENOSINE 12** mg IV rapid IVP

YES → Monitor, reassess

YES → *WIDE COMPLEX RHYTHM*

P: **AMIODARONE 150** mg IV over 10 minutes
May repeat **x 1**

YES → P

Consider Sedation

- **MIDAZOLAM IV / IM / IN** — May repeat x 1 in 5 minutes
- **KETAMINE IM / IV** — May repeat x 1 in 5-10 minutes
- **LORAZEPAM IV / IM** — **May repeat x 1 in 5 minutes**

Consider Analgesia

- **FENTANYL IV / IM / IN** — May repeat x 1 in 5 minutes
- **MORPHINE IV / IM** — **May repeat x 1 in 5 minutes**

QRS wide?

NO → **Rhythm regular?**

NO → *NARROW COMPLEX IRREGULAR RHYTHM*

P: Sync Cardiovert 200J, 360J

YES → *NARROW COMPLEX REGULAR RHYTHM*

P: Sync Cardiovert 50J, 100J, 200J, 360J
Consider **ADENOSINE** 6 mg IV rapid IVP
May repeat **ADENOSINE 12** mg IV rapid IVP

YES → **Rhythm regular?**

NO → *WIDE COMPLEX IRREGULAR RHYTHM*

P: Defibrillate 360J

YES → *WIDE COMPLEX REGULAR RHYTHM*

P: Sync Cardiovert 100J, 200J, 360J

	50-74 kg	75-90 kg	>90 kg	Geriatric
Fentanyl IV / IM	50 mcg	75 mcg	75 mcg	25 mcg
Fentanyl IN	100 mcg	100 mcg	100 mcg	50 mcg
Ketamine IV	75-150 mg	100-200 mg	125-250 mg	M
Lorazepam IV / IM	2 mg	2 mg	2 mg	1 mg
Midazolam IV	2.5 mg	5 mg	5 mg	2.5 mg
Midazolam IM / IN	5 mg	10 mg	10 mg	5 mg
Morphine IV / IM	4 mg	6 mg	6 mg	2 mg

CARDIAC ARREST MANAGEMENT Procedure (P-30)

AED / monitor:
Check rhythm and pulse
Verify asystole in multiple leads

Airway: Monitor and trend ETCO2
BLS preferred

Shockable rhythm?
Evaluate q 2 minutes

NO → **A** **EPINEPHRINE 1:10,000 IV**
q 4 minutes, may repeat PRN

YES

AED Shock or Defib 4J/kg

A **EPINEPHRINE 1:10,000 IV**
q 4 minutes, may repeat PRN

A **AMIODARONE IV bolus**
May repeat up to 2x

Consider OPTIONS BASED ON ASSESSMENT

ROSC?

NO → Consider **MEDICAL CEASE RESUSCITATION Protocol (MC – 9)**

YES

POST RESUSCITATION Protocol (MC – 6)

M Medical Command for additional orders as indicated

OPTIONS BASED ON ASSESSMENT

A
- Hypoglycemia: **DEXTROSE IV**
- Overdose: **NALOXONE IV / IM /IN** *ONLY* if not intubated

P
- Torsades: **MAGNESIUM IV**
- Tension Pneumothorax: **CHEST DECOMPRESSION Procedure**
- Toxins:
  Known tricyclic OD:
  SODIUM BICARBONATE IV

M
- Toxic smoke inhalation:
  Medical Command for
  HYDROXOCOBALAMIN IV

If ROSC at any time, go to **POST RESUSCITATION Protocol (MC – 6)**

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg
Amiodarone IV					60 mg	75 mg	100 mg	150 mg	150 mg
Calcium Chloride IV	100 mg	150 mg	175 mg	200 mg	250 mg	300 mg	400 mg	600 mg	800 mg
Calcium Chloride 10% (ml) IV	1 ml	1.5 ml	1.75 ml	2 ml	2.5 ml	3 ml	4 ml	6 ml	8 ml
Defibrillation	20 J	28 J	36 J	40 J	48 J	60 J	80 J	120 J	160 J
Dextrose IV	2 gm	3.5 gm	4.5 gm	5 gm	6 gm	8 gm	10 gm	15 gm	20 gm
Dextrose 50% (ml) IV	4 ml	7 ml	9 ml	10 ml	12 ml	15 ml	20 ml	30 ml	40 ml
Dextrose 25% (ml) IV					24 ml	30 ml	40 ml	60 ml	80 ml
Dextrose 10% (ml) IV	20 ml	35 ml	45 ml	50 ml	60 ml	75 ml	100 ml		
Epinephrine 1: 1000 SQ/IM	0.05 ml	0.07 ml	0.09 ml	0.1 ml	0.12 ml	0.15 ml	0.2 ml	0.3 ml	0.4 ml
Epinephrine 1:10,000 IV	0.05 mg	0.07 mg	0.09 mg	0.1 mg	0.12 mg	0.15 mg	0.2 mg	0.3 mg	0.4 mg
Epinephrine 1:10,000 (ml) IV	0.5 ml	0.7 ml	0.9 ml	1 ml	1.2 ml	1.5 ml	2 ml	3 ml	4 ml
Hydroxocobalamin IV	350 mg	500 mg	650 mg	700 mg	850 mg	1050 mg	1400 mg	2100 mg	2800 mg
Magnesium Sulfate IV					300 mg	400 mg	500 mg	750 mg	1 g
Magnesium Sulfate 10% IV (ml)					3 ml	4 ml	5 ml	7.5 ml	10 ml
Magnesium Sulfate 50% IV (ml)					0.6 ml	0.8 ml	1 ml	1.5 ml	2 ml
Naloxone IV / IM / IN	0.5 mg	0.7 mg	1 mg	1 mg	1.2 mg	1.5 mg	2 mg	2 mg	2 mg
Sodium Bicarbonate IV				10 mEq	12 mEq	15 mEq	20 mEq	30 mEq	40 mEq

CARDIAC ARREST: ADULT MEDICAL PROTOCOL

Medical Society of Sedgwick County

V1.2 (10-1-14)

MC - 5

Effective 7-1-2012

CARDIAC ARREST MANAGEMENT Procedure (P-30)

AED / monitor:
Check rhythm and pulse
Verify asystole in multiple leads when able

Airway: Monitor and trend ETCO2
BLS or Combitube preferred

Shockable rhythm?
Evaluate q 2 minutes

NO → **A** **EPINEPHRINE 1:10,000 IV**
1 mg q 4 minutes
May repeat PRN

YES

AED Shock or Defib 360J

A **EPINEPHRINE 1:10,000 IV**
1 mg q 4 minutes
May repeat PRN

A **AMIODARONE IV**
300 mg initial bolus x 1

A **AMIODARONE IV**
150 mg bolus x 1
after 4 minutes

Consider OPTIONS BASED ON ASSESSMENT

ROSC?

NO → Consider **MEDICAL CEASE RESUSCITATION Protocol (MC – 9)** → **M** Medical Command for additional orders as indicated

YES

POST RESUSCITATION Protocol (MC – 6)

AED Shock or Defib 360J
Repeat q 2 minutes after each med administration as indicated

If ROSC at any time, go to **POST RESUSCITATION** Protocol (MC – 6)

OPTIONS BASED ON ASSESSMENT

A
- Hypoglycemia: **DEXTROSE 25 g IV**
- Hypovolemia: **Chilled Normal Saline** 1-2L bolus (atraumatic arrest only)
- Overdose: **NALOXONE** 2 mg IV/IM /IN *ONLY* if not intubated

P
- Torsades: **MAGNESIUM** 2 g IV
- Tension Pneumothorax: **CHEST DECOMPRESSION Procedure**
- Hyperkalemia (dialysis or end-stage renal dz): **CALCIUM CHLORIDE** 1 g IV
- Toxins:
  Cyanide / smoke inhalation: **HYDROXOCOBALAMIN** 5 g IV
  Known tricyclic OD: **SODIUM BICARBONATE** 100 mEq IV

	50-74 kg	≥75 kg	Geriatric
Calcium Chloride IV	1g	1g	1g
Calcium Chloride 10% (ml) IV	10 ml	10 ml	10 ml
Magnesium Sulfate IV	2 g	2 g	1 g
Magnesium Sulfate 50% IV (ml)	4 ml	4 ml	2 ml

POST RESUSCITATION CARE: ADULT & PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

V3.1 (9-5-2018)

MC - 6

Effective 7-1-2012

Optimize oxygenation
Oxygen saturation ≥ 94%

Optimize ventilation
ETCO2 35-45 mmHg
DO NOT HYPERVENTILATE

Secure 2 vascular access sites (IV or IO--No more than 1 IO in medical patient)

Is perfusion optimized?
(see parameters box for target BP)

YES

NO

Able to follow commands?

NO

YES

A	Medical (≥ 18 yr old): Chilled **NORMAL SALINE** 2L IV Bolus
	Medical (< 18 yr old) or any Trauma: **NORMAL SALINE** 20 ml/kg (MAX 2L) IV Bolus, warmed if trauma

Persistent inadequate perfusion?

YES

NO

Options based on assessment

Medical: 12 lead ECG

Need for sedation to maintain invasive airway?

NO

YES

P	**MIDAZOLAM** IV / IM / IN May repeat x 1 in 5 minutes
	LORAZEPAM IV / IM **May repeat x 1 in 5 minutes**

OPTIONS BASED ON ASSESSMENT

A	Hypoglycemia: **DEXTROSE IV**
	Hypovolemia: **NORMAL SALINE IV** bolus – warmed saline if trauma
	Overdose: **NALOXONE IV / IM / IN** *ONLY* if not intubated
P	Torsades: **MAGNESIUM IV**
	Tension Pneumothorax: **CHEST DECOMPRESSION Procedure (P-25)**
	Hyperkalemia (dialysis or end-stage renal): **CALCIUM CHLORIDE IV**
	Toxin: Known tricyclic overdose: **SODIUM BICARBONATE IV**
M	Toxin: Suspected cyanide toxicity: **HYDROXOCOBALAMIN IV**

TITRATE TO ADEQUATE PERFUSION

A	Trauma: Repeat **NORMAL SALINE** Bolus
P	**Push pressor EPINEPHRINE:** 10 mcg bolus (1 mL of 1:100,000 concentration) every 3-5 minutes
	Medical: < 18 yr old: **EPINEPHRINE** 0.1 mcg/kg/min IV gtt May titrate to 0.5 mcg/kg/min

PENETRATING TRAUMA: Permissive hypotension – target is no more than below.
MEDICAL: Blood pressure target for optimal / adequate perfusion
Adult: SBP ≥ 90 mmHg or MAP ≥ 65 mmHg
Pediatric: SBP ≥ 70 + (patient age x 2)

Resuscitated medical arrest: transport to designated resuscitation center
Resuscitated trauma arrest: transport to Level 1 trauma center

	5 Kg	7 Kg	9 Kg	10 Kg	12 Kg	15 Kg	20 Kg	30 Kg	40 Kg	50-74 Kg	≥75 Kg	Geriatric
Calcium Chloride IV	100 mg	150 mg	175 mg	200 mg	250 mg	300 mg	400 mg	600 mg	800 mg	1g	1g	1g
Calcium Chloride 10% (ml) IV	1 ml	1.5 ml	1.75 ml	2 ml	2.5 ml	3 ml	4 ml	6 ml	8 ml	10 ml	10 ml	10 ml
Dextrose IV	2 gm	3.5 gm	4.5 gm	5 gm	6 gm	8 gm	10 gm	15 gm	20 gm	25 gm	25 gm	25 gm
Dextrose 50% (ml) IV	4 ml	7 ml	9 ml	10 ml	12 ml	15 ml	20 ml	30 ml	40 ml	50 ml	50 ml	50 ml
Dextrose 25% (ml) IV					24 ml	30 ml	40 ml	60 ml	80 ml			
Dextrose 10% (ml) IV	20 ml	35 ml	45 ml	50 ml	60 ml	75 ml	100 ml					
Dopamine gtt (mcg/min) IV-- starting dose of 5 mcg/kg/min										250 mcg/min	375 mcg/min	250 mcg/min
Epinephrine gtt (mcg/min) IV-- starting dose of 0.1 mcg/kg/min	0.5 mcg/min	0.7 mcg/min	0.9 mcg/min	1 mcg/min	1.2 mcg/min	1.5 mcg/min	2 mcg/min	3 mcg/min	4 mcg/min			
Hydroxocobalamin IV	350 mg	500 mg	650 mg	700 mg	850 mg	1050 mg	1400 mg	2100 mg	2800 mg	5 g	5 g	5 g
Lorazepam IV / IM				0.5 mg	0.6 mg	0.75 mg	1 mg	1.5 mg	2 mg	2 mg	2 mg	1 mg
Magnesium Sulfate IV					300 mg	400 mg	500 mg	750 mg	1 g	2 g	2 g	1 g
Magnesium Sulfate 50% IV (ml)					0.6 ml	0.8 ml	1 ml	1.5 ml	2 ml	4 ml	4 ml	2 ml
Midazolam IV				0.5 mg	0.6 mg	0.75 mg	1 mg	1.5 mg	2 mg	2.5 mg	5 mg	2.5 mg
Midazolam IM / IN				1 mg	1.2 mg	1.5 mg	2 mg	3 mg	4 mg	5 mg	10 mg	5 mg
Morphine IV / IM	0.5 mg	0.7 mg	1 mg	1 mg	1.25 mg	1.5 mg	2 mg	3 mg	4 mg	4 mg	6 mg	2 mg
Naloxone IV / IM / IN	0.5 mg	0.7 mg	1 mg	1 mg	1.2 mg	1.5 mg	2 mg	2 mg	2 mg	2 mg	2 mg	2 mg
Sodium Bicarbonate IV				10 mEq	12 mEq	15 mEq	20 mEq	30 mEq	40 mEq	50 mEq	75 mEq	50 mEq
Normal Saline IV bolus (20 ml/kg)	100 ml	140 ml	180 ml	200 ml	240 ml	300 ml	400 ml	600 ml	800 ml	2 L	2 L	1 L

Mix 4 mcg/ml drip by adding 0.6 mg of epinephrine to 150 ml bag	5 Kg	7 Kg	9 Kg	10 Kg	12 Kg	15 Kg	20 Kg	30 Kg	40 Kg		
Epinephrine gtt (mcg/min) IV-- starting dose of 0.1 mcg/kg/min	0.5 mcg/min	0.7 mcg/min	0.9 mcg/min	1 mcg/min	1.2 mcg/min	1.5 mcg/min	2 mcg/min	3 mcg/min	4 mcg/min		
Epinephrine 4 mcg/ml gtt (gtt/min) IV-- 0.1 mcg/kg/min on 60gtt/ml set STARTING dose	8 gtt/min	11 gtt/min	14 gtt/min	15 gtt/min	18 gtt/min	23 gtt/min	30 gtt/min	45 gtt/min	60 gtt/min		
Epinephrine 4 mcg/ml gtt (gtt/min) IV-- 0.5 mcg/kg/min on 60gtt/ml set MAX dose	40 gtt/min	55 gtt/min	70 gtt/min	75 gtt/min	90 gtt/min	115 gtt/min	150 gtt/min	225 gtt/min	300 gtt/min		

Ensure Protocol MC-6 has been implemented. All treatment options in MC-6 are concurrently available in this protocol.

↓

Optimize perfusion

↓

TITRATE TO MAP OF >60

C

PHENYLEPHRINE
50-200 mcg (100 mcg/mL concentration) every 3-10 minutes (0.5-2 mL per dose) *Or*

EPINEPHERINE
5-20 mcg (10 mcg/mL) every 3-5 minutes (0.5-2 mL per dose) *Or*

NOREPINEPHRINE
5-30 mcg/min initially, titrate to effect.

↓

Optimize ventilation

↓

TRANSFER PATIENT TO MECHANICAL VENTILATOR IF UNABLE TO FOLLOW COMMANDS

C

ASSESS AIRWAY STATUS
If iGel in place, consider risk/benefit of replacing iGel with ETT

RSI IF NEEDED (P-52)

APPLY MECHANICAL VENTILATOR
AC/PRVC mode, PEEP 5, TV 450 for males, 500 for males over 6 foot, 400 for females, 350 for females under 5 foot. FiO2 70% and titrated to saturation >94%. Respiratory rate titrated to EtCO2 35-45.

CONSIDERATIONS AND OPTIONS BASED ON ASSESSMENT

C

If STEMI suspected, consider coordination with VCSF or WMC for direct to cath lab delivery.

Sustained ROSC of at least 20 minutes prior to transport decreases chance of re-arrest. Benefits of transport should be carefully weighed against risk of re-arrest.

If patient is showing signs of cerebral perfusion with chest compressions or Lucas device, sedation may be administered as per CCP discretion.

TACHYCARDIA: PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

V 2.0 (10-5-12)

MC - 7

Effective 7-1-2012

PEDIATRIC ASSESSMENT Protocol (A – 1)

Evaluate for and treat underlying causes: fever, hypovolemia, sepsis – these are by far the most likely causes of pediatric tachycardia

Tachycardia:
Infants > 220/min
Children >180/min
No rate variability

SEVERE symptoms / unstable?
Inadequate perfusion **due to tachycardia**: Hypotension / shock, altered mental status

NO → **Supportive care**

YES

M

Consider Sedation	**MIDAZOLAM IV / IM / IN** May repeat x 1 in 5 minutes	**LORAZEPAM IV / IM May repeat x 1 in 5 minutes**
Consider Analgesia	**FENTANYL IV / IM / IN** May repeat x 1 in 5 minutes	**MORPHINE IV / IM May repeat x 1 in 5 minutes**

M Sync cardiovert 1J/kg, if ineffective 2J/kg

QRS wide (>0.09 sec)?

NO → *NARROW COMPLEX REGULAR RHYTHM*

M **ADENOSINE first dose** IV rapid IVP
May repeat **ADENOSINE second dose** IV rapid IVP

YES

WIDE COMPLEX REGULAR RHYTHM

M **AMIODARONE IV** over 20 min

Consider **ADENOSINE IV** rapid IVP

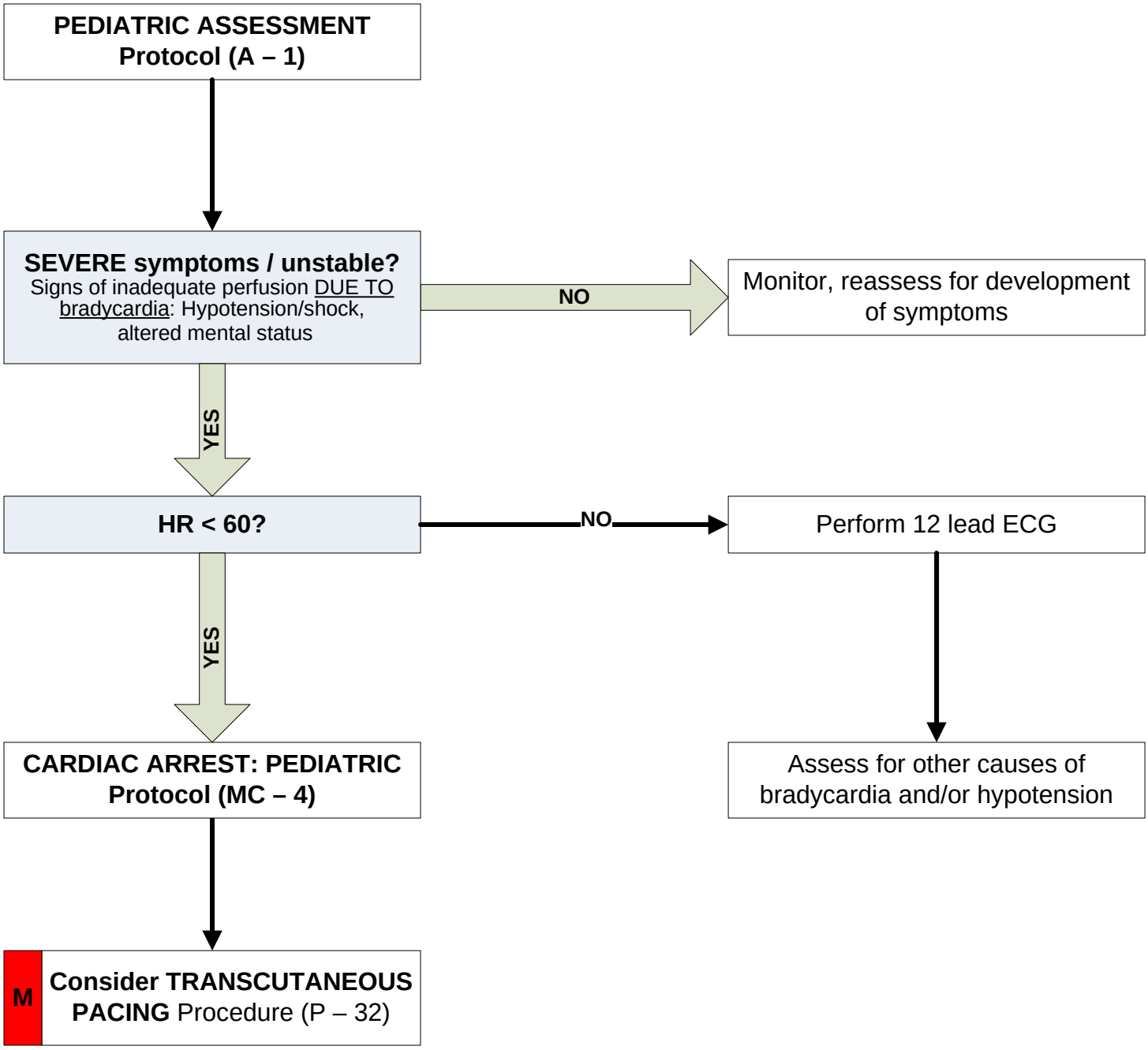
	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg
Adenosine--first dose IV	0.5 mg	0.7 mg	0.9 mg	1 mg	1.2 mg	1.5 mg	2 mg	3 mg	4 mg
Adenosine--second dose IV	1 mg	1.4 mg	1.8 mg	2 mg	2.4 mg	3 mg	4 mg	6 mg	8 mg
Amiodarone IV					60 mg	75 mg	100 mg	150 mg	150 mg
Cardioversion--initial	2 J	4 J	5 J	5 J	6 J	8 J	10 J	15 J	20 J
Cardioversion--second +	4 J	8 J	10 J	10 J	12 J	15 J	20 J	30 J	40 J
Fentanyl IV / IM				10 mcg	10 mcg	15 mcg	20 mcg	25 mcg	25 mcg
Fentanyl IN	10 mcg	15 mcg	20 mcg	20 mcg	25 mcg	30 mcg	40 mcg	50 mcg	50 mcg
Lorazepam IV / IM				0.5 mg	0.6 mg	0.75 mg	1 mg	1.5 mg	2 mg
Midazolam IV				0.5 mg	0.6 mg	0.75 mg	1 mg	1.5 mg	2 mg
Midazolam IM / IN				1 mg	1.2 mg	1.5 mg	2 mg	3 mg	4 mg
Normal Saline IV bolus (20 ml/kg)	100 ml	140 ml	180 ml	200 ml	240 ml	300 ml	400 ml	600 ml	800 ml

BRADYCARDIA: PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

MC - 8

Effective 7-1-2012



MEDICAL CEASE RESUSCITATION: ADULT & PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

V 2.2 (8-18-2018)

MC - 9

Effective 7-1-2012

Normothermic medical arrest?

NO → **ENVIRONMENTAL EMERGENCIES Protocol (M-7)** → **Traumatic arrest?**

YES → **Consider TRAUMA CEASE RESUSCITATION Protocol (T – 3)**

Findings incompatible with life:
Pulseless and apneic AND any of the following:

- Rigor mortis
- Decomposition

Do not initiate resuscitation:

- if valid DNR / TPOPP order
- **ADULT ONLY:** > 15 minute down time and no bystander CPR and initial rhythm asystole

YES → **Findings Incompatible with Life OR Meets criteria for Do Not Initiate Resuscitation?**

YES → **Cease resuscitation.** Note time of death and cease resuscitation by standing order

NO → **Adequate CPR? (PIT CREW R-21)**

NO → **Assure adequate CPR, CARDIAC ARREST Protocol (MC – 4, MC – 5)**

YES → **Adequate airway management?**

NO → **AIRWAY MANAGEMENT Procedure (P – 10)**

YES → **Rhythm-appropriate medications administered at proper times?**

NO → **CARDIAC ARREST Protocol (MC – 4, MC – 5)**

YES → **Persistent asystole or agonal rhythm without reversible causes for ADULT: > 20 minutes, PEDIATRIC: > 30 minutes?**

NO (VT/VF/ PEA INCLUDED IN RHYTHMS) → **Continue CARDIAC ARREST Protocol for at least 30 min, treat potential reversible causes**

YES → **Failure to establish ROSC at any time OR failure to sustain ROSC for > 5 minutes?**

YES → **At time cease resuscitation is considered, what is EtCO2 with CPR?**

EtCO2 > 30 with CPR? → **Continue resuscitation** on scene

EtCO2 < 10 → **Cease resuscitation**
Note time of death

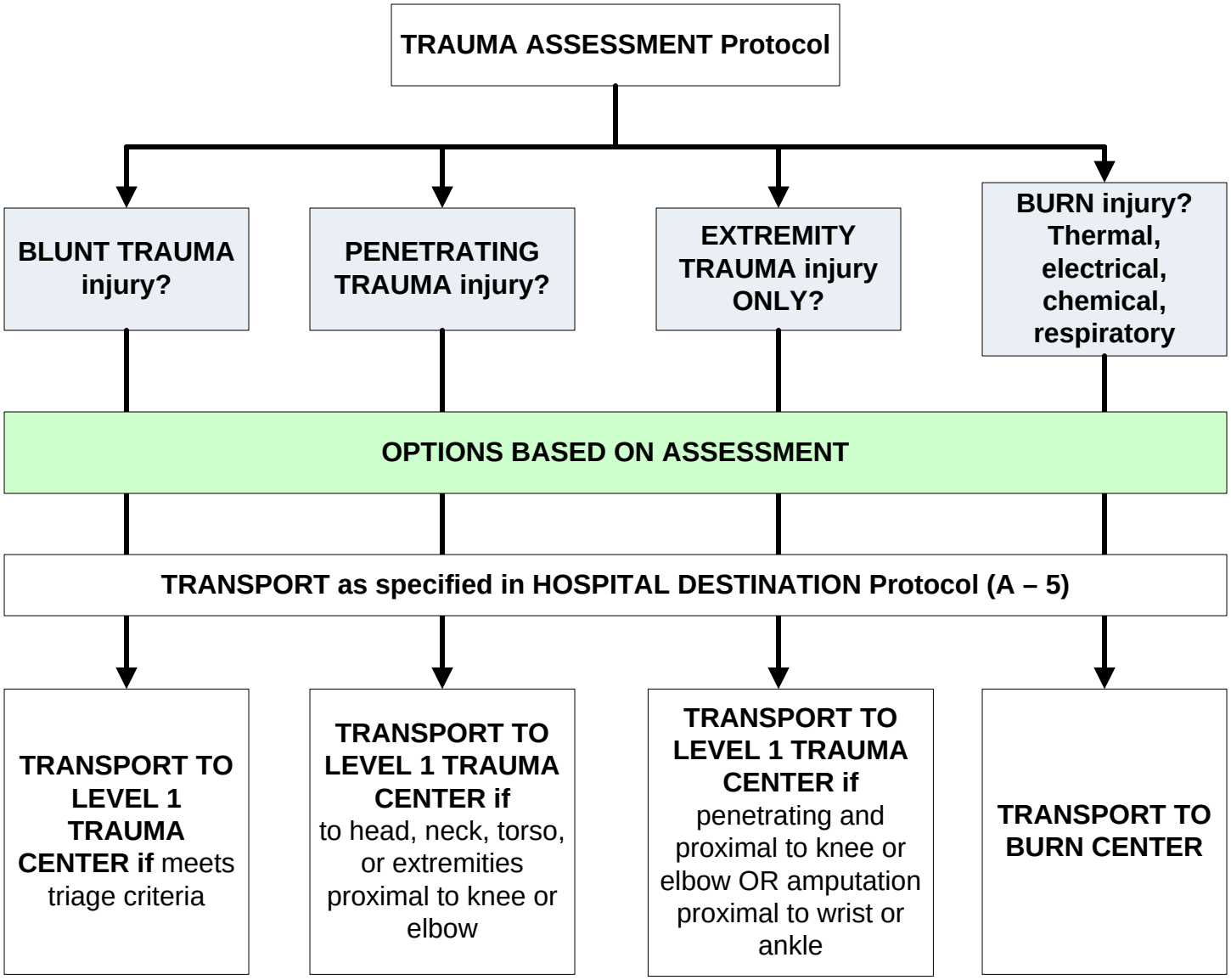
EtCO2 10-30 with CPR → C M Continue resuscitation, discuss with medical command or onscene credentialed critical care paramedic regarding transport or potential cease resuscitation

TRAUMA MANAGEMENT: ADULT & PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

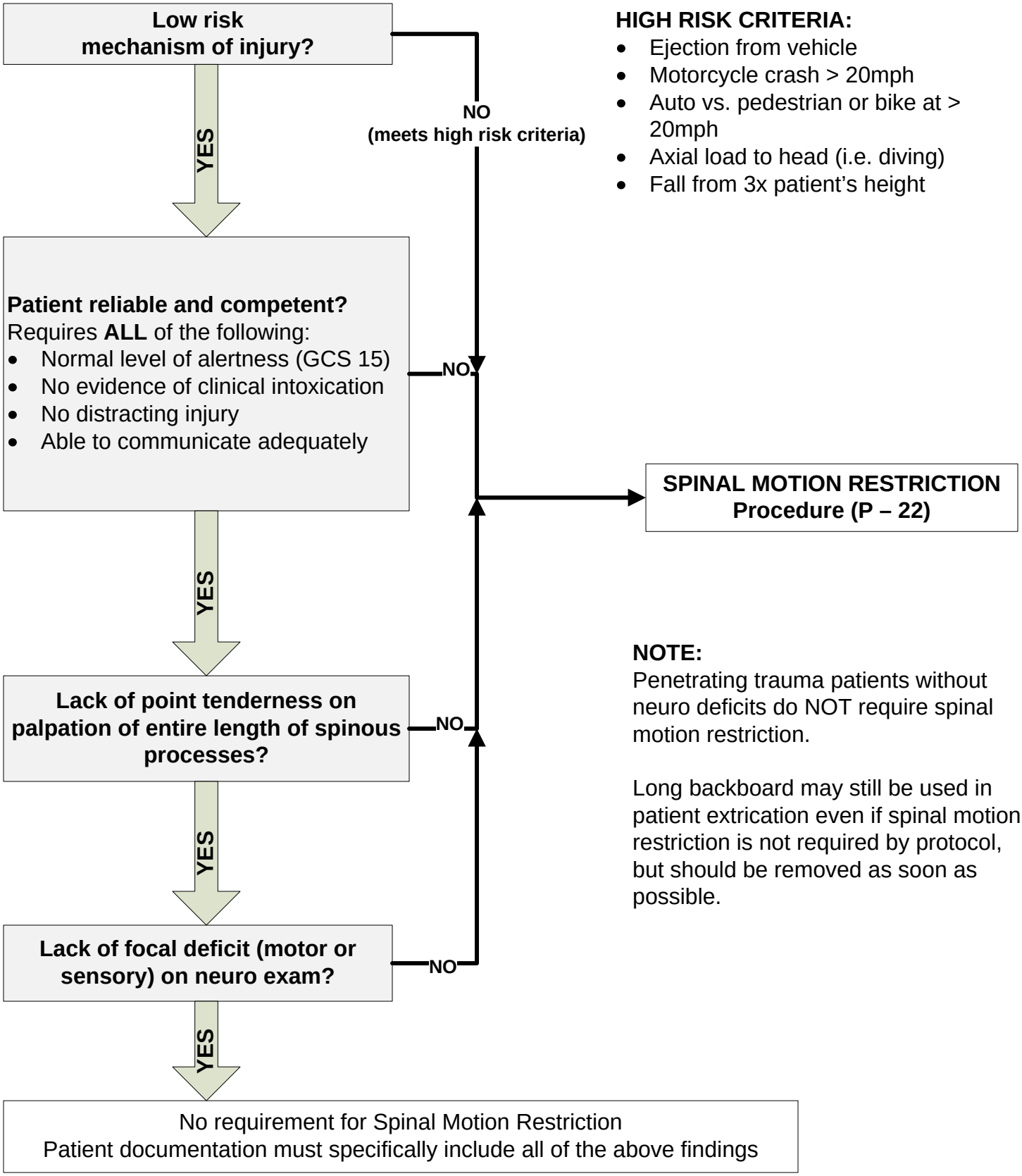
T - 1

Effective 7-1-2012



OPTIONS BASED ON ASSESSMENT

HEMORRHAGE CONTROL Procedure (P – 20)	**PAIN MANAGEMENT Protocol (M – 8)**
TENSION PNEUMOTHORAX DECOMPRESSION Procedure (P – 25)	**NAUSEA Protocol (M – 9)**
VASCULAR ACCESS Procedure (P – 40)	**FLUID RESUSCITATION Procedure (P – 42)**
	TOURNIQUET Procedure (P – 21)



HIGH RISK CRITERIA:

- Ejection from vehicle
- Motorcycle crash > 20mph
- Auto vs. pedestrian or bike at > 20mph
- Axial load to head (i.e. diving)
- Fall from 3x patient's height

NOTE:
Penetrating trauma patients without neuro deficits do NOT require spinal motion restriction.

Long backboard may still be used in patient extrication even if spinal motion restriction is not required by protocol, but should be removed as soon as possible.

TRAUMA CEASE RESUSCITATION: ADULT & PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

V2.1 (10-1-14)

T - 3

Effective 7-1-2012

Adult or pediatric normothermic traumatic arrest AND medical etiology considered?

NO

YES

Findings incompatible with life?

YES → Cease or do not initiate resuscitation. Note time of death and cease resuscitation by standing order

NO

Pulseless and apneic on first provider arrival as per DETERMINATION OF DEATH Procedure (P- 50)

NO → **TRAUMA ASSESSMENT and MANAGEMENT** Protocols (A -3, T – 1)

YES

Initiate basic resuscitative efforts

Findings Incompatible with Life: Pulseless and apneic AND any of the following: Rigor mortis
Decomposition Decapitation Incineration
Gunshot wound to head that crosses the midline
Submersion for > 30 minutes in most submersion injuries—consider resuscitation in pediatric cold water submersion.

Lack of spontaneous respirations after basic airway maneuvers?

NO (IS BREATHING) → **AIRWAY MANAGEMENT** Procedure (P – 10)

YES

Lack of mechanism / suspicion for tension pneumothorax?

NO (POSS TPTX) → **NEEDLE CHEST DECOMPRESSION** Procedure (P – 25) ROSC or change in rhythm?

NO

YES

No organized ECG activity *OR* PEA < 40?

NO (HAS ORGANIZED ECG ACTIVITY) → **TRAUMA ASSESSMENT and MANAGEMENT** Protocols (A – 3, T – 1)

YES

In patients with hypoxic traumatic arrest (hanging, drowning), additional resuscitative effort may be appropriate before cease resucitation. In blunt or penetrating trauma, cease resuscitation by standing order if criteria met and note time of death.

M Discuss with medical command, transport to closest appropriate trauma center

ALTERED MENTAL STATUS: ADULT & PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

M - 1

Effective 7-1-2012

ADULT or PEDIATRIC ASSESSMENT Protocol (A-1, A-2)

Glucose < 50 mg/dl? — NO → **Glucose 50-300 mg/dl?** — NO → Signs/symptoms of dehydration?

Glucose < 50 mg/dl? — YES →

OPTIONS BASED ON ASSESSMENT (choose one)

- **E** — **ORAL GLUCOSE PO** 31 g if pt able to protect airway
- **E** — **GLUCAGON IM** (autoinjector only)
- **A** — **DEXTROSE IV**
- **A** — **GLUCAGON IM / IN**

→ Re-evaluate blood glucose level after 5-10 minutes

→ **A** If < 100 mg/dl and mental status still altered, May repeat **DEXTROSE IV**

Glucose 50-300 mg/dl? — YES →

Consider other causes:
A – Alcohol
E – Epilepsy, Electrolyte
I – Insulin
O – Overdose
U – Uremia
T – Temp, Trauma
I – Infection
P – Poisoning (including CO)
S – Shock
ETCO2

→ **A** **NALOXONE IV / IM / IN**
Only if respirations depressed.
Listed dose is maximum dose.
Titrate IV dosing in increments of no more than 0.5mg
to achieve adequate respiratory effort and ability to protect airway

→ Consider **POISONING / TOXIC INGESTION Protocol (M – 6)**

Signs/symptoms of dehydration? — NO →

Signs/symptoms of dehydration? — YES →

A Consider **NORMAL SALINE** IV bolus

→ **M** Medical Command for additional orders

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	≥75 kg	Geriatric
Dextrose IV	2 gm	3.5 gm	4.5 gm	5 gm	6 gm	8 gm	10 gm	15 gm	20 gm	25 gm	25 gm	25 gm
Dextrose 50% (ml) IV	4 ml	7 ml	9 ml	10 ml	12 ml	15 ml	20 ml	30 ml	40 ml	50 ml	50 ml	50 ml
Dextrose 25% (ml) IV					24 ml	30 ml	40 ml	60 ml	80 ml			
Dextrose 10% (ml) IV	20 ml	35 ml	45 ml	50 ml	60 ml	75 ml	100 ml					
Glucagon IM / IN	0.5 mg	0.5 mg	0.5 mg	0.5 mg	0.5 mg	0.5 mg	1 mg	1 mg	1 mg	1 mg	1 mg	1 mg
Naloxone IV / IM / IN	0.5 mg	0.7 mg	1 mg	1 mg	1.2 mg	1.5 mg	2 mg	2 mg	2 mg	2 mg	2 mg	2 mg
Normal Saline IV bolus (20 ml/kg)	100 ml	140 ml	180 ml	200 ml	240 ml	300 ml	400 ml	600 ml	800 ml	2 L	2 L	1 L

Observed Positive Cincinnati Stroke Scale within 24 hours?

No → Supportive care, transport to any hospital of patient's choice

Yes ↓

Last seen normal **less than 6 hours?** OR **Wake up stroke**

No → Recommend transport to Via Christi St Francis or Wesley Main

Yes ↓

Perform **R**apid **A**rterial o**C**clusion **E**valuation (**RACE**) Assessment

Item	Instruction	Result	Score
Facial Palsy	Ask the patient to show their teeth (smile)	**Absent**: symmetrical movement **Mild**: slightly asymmetrical **Severe**: completely asymeterical	**0** **1** **2**
Arm Function	Extend the arm of the patient 90˚ (sitting) or 45˚ (if supine)	**Mild**: upheld more than 10 seconds **Moderate**: upheld less than 10 seconds **Severe**: cannot lift arm against gravity	**0** **1** **2**
Leg Function	Extend the leg of the patient 30˚ (supine)	**Mild**: upheld more than 5 seconds **Moderate**: upheld less than 5 seconds **Severe**: cannot lift leg against gravity	**0** **1** **2**
Head & Gaze Deviation	Observe eyes and head deviation to one side	**Absent**: no head deviation OR eye movements to both sides possible **Present**: eyes AND head deviated to one side observed	**0** **1**
Receptive Aphasia (Right side)	Ask patient to follow two commands: 1. Close your eyes 2. Make a fist	**Normal**: performs tasks correctly **Moderate**: performs one task correctly **Severe**: Cannot perform either task	**0** **1** **2**
Agnosia (Left side)	Ask patient: 1. "Whose arm is this?"(while showing affected arm) 2. "Can you move your arm?"	**Normal**: recognizes and attempts to move arm **Moderate**: does not recognize OR is unaware of arm **Severe**: does not recognize AND is unaware of arm	**0** **1** **2**
Is total RACE high (5-9) or low (0-4)?		**TOTAL SCORE**	

ALWAYS ASSESS THESE FOUR AREAS

ONLY ASSESS ONE OF THESE TWO AREAS

Low RACE 0-4 → Call Stroke Alert → Recommend transport to Via Christi St Francis or Wesley Main

High RACE 5-9 → Call LVO Stroke Alert → Recommend transport to Via Christi St Francis

ALLERGIC REACTION / ANAPHYLAXIS: ADULT & PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County V1.1 (12-26-12)

M - 3

Effective 7-1-2012

ADULT or PEDIATRIC ASSESSMENT Protocol

↓

Oxygen to maintain saturations ≥ 94% or to improve air hunger

↓

Extremis or previous true anaphylaxis?

NO →

YES ↓

E	**EPIPEN or EPIPEN JR IM**
P	**EPINEPHRINE 1:1000 IM**

Allergic Reaction S/S:

gradual onset; mild flushing, rash, hives; mild bronchoconstriction; normal mental status

OPTIONS BASED ON ASSESSMENT

E	**ALBUTEROL 5 mg** nebulized May repeat as needed
A	**ALBUTEROL 6 mg** with **IPRATROPIUM 1 mg** nebulized May repeat as needed
	NORMAL SALINE BOLUS IV
	DIPHENHYDRAMINE IM / IV
P	**PREDNISONE PO** *Or* **METHYLPREDNISOLONE IV**

↓

Persistent or worsening symptoms after 5 minutes?

YES ↓

M	Medical command for additional orders: **EPINEPHRINE 1:1000** IM

EXTREMIS S/S:

near arrest, unable to speak, tachypnea, hypotension

Anaphylaxis S/S:

sudden onset; severe flushing, rash, hives; severe bronchoconstriction, laryngospasm; anxiety, sense of impending doom; LOC decreases, then unconscious

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	≥75 kg	Geriatric
Diphenhydramine IV					6.25 mg	6.25 mg	12.5 mg	12.5 mg	25 mg	50 mg	50 mg	12.5 mg
Diphenhydramine IM					12.5 mg	12.5 mg	25 mg	25 mg	50 mg	50 mg	50 mg	25 mg
Epinephrine 1: 1000 SQ/IM	0.05 ml	0.07 ml	0.09 ml	0.1 ml	0.12 ml	0.15 ml	0.2 ml	0.3 ml	0.4 ml	0.5 ml	0.5 ml	0.5 ml
Methylprednisolone	10 mg	14 mg	18 mg	20 mg	24 mg	30 mg	40 mg	62.5 mg	80 mg	125 mg	125 mg	125 mg
Prednisone PO							20 mg	20 mg	40 mg	60 mg	60 mg	60 mg
Normal Saline IV bolus (20 ml/kg)	100 ml	140 ml	180 ml	200 ml	240 ml	300 ml	400 ml	600 ml	800 ml	2 L	2 L	1 L

SEIZURE: ADULT and PEDIATRIC
MEDICAL PROTOCOL
Medical Society of Sedgwick County

V2.0 (10-5-12)

M - 4
Effective 7-1-2012

ADULT or PEDIATRIC ASSESSMENT Protocol (A – 1, A – 2)

Blood Glucose Level > 50mg/dl?
- NO → **ALTERED MENTAL STATUS Protocol (M – 1)**
- YES ↓

Active seizure or recurrent seizure without lucid interval?
- NO → Monitor, supportive care
- YES ↓

Pregnant 3rd trimester with signs of eclampsia? (Hypertension, hyperreflexia)
- NO → **P** **MIDAZOLAM IV / IM / IN** or **LORAZEPAM IV / IM**
- YES ↓

P **MAGNESIUM SULFATE 10% IV over 15 minutes**

PERSISTENT SEIZURE → **P** **MIDAZOLAM IV / IM / IN** or **LORAZEPAM IV / IM**

May repeat x 1 in 2 minutes if ongoing seizure activity

Magnesium toxicity?
S/S - Hypotension, altered mental status, depressed respiratory effort, depressed cardiac function/blocks
- NO →
- YES ↓

TOXIC EXPOSURE Protocol (M – 6)

Persistent seizure 5 minutes after second medication?
- NO → Monitor, supportive care
- YES ↓

M Request orders for repeat dose: **MIDAZOLAM IV / IM / IN** or **LORAZEPAM IV / IM** or (pregnant pt only) **MAGNESIUM 10% IV**

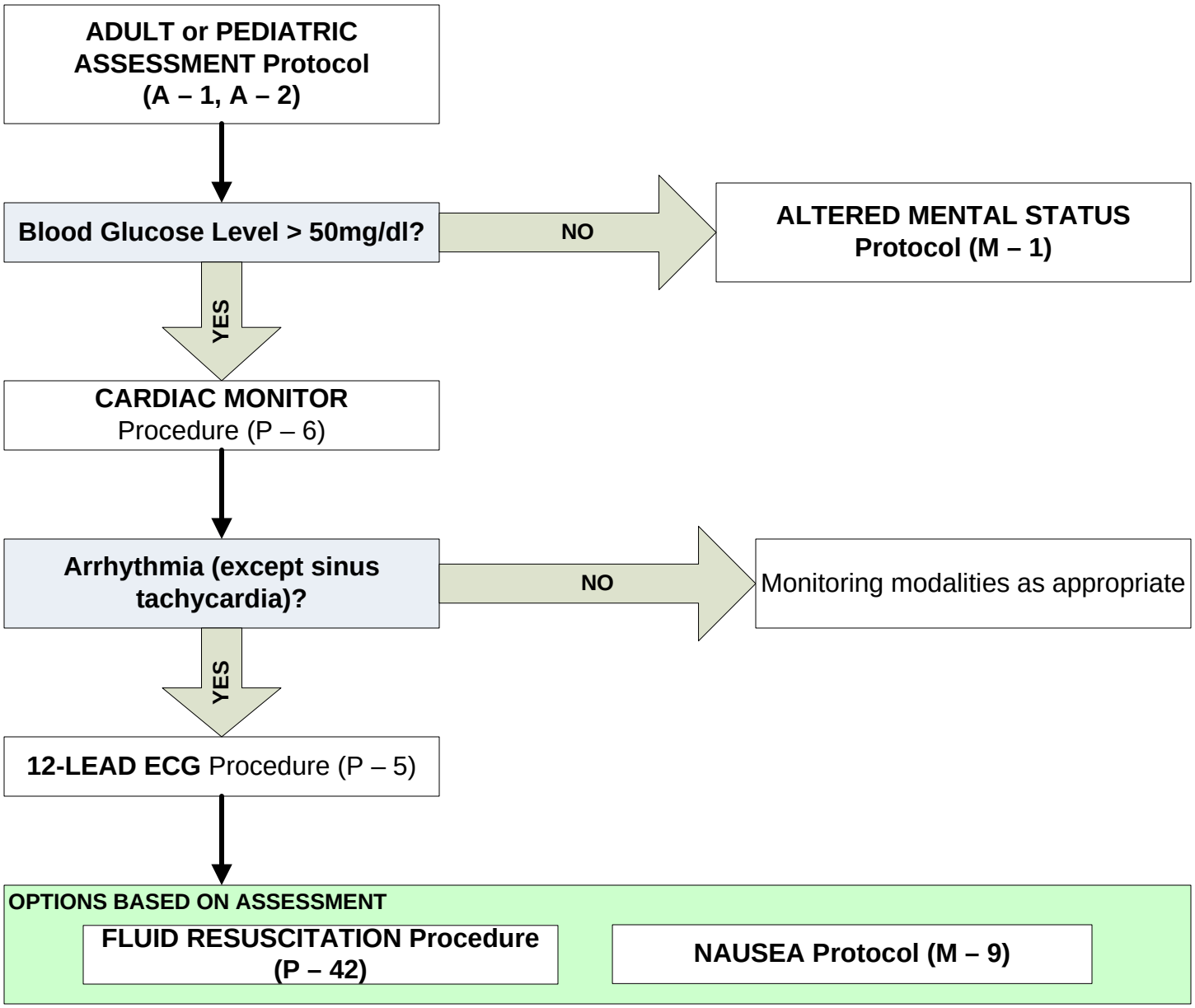
	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	≥75 kg	Geriatric
Lorazepam IV / IM				0.5 mg	0.6 mg	0.75 mg	1 mg	1.5 mg	2 mg	2 mg	2 mg	1 mg
Magnesium Sulfate IV								750 mg	1 g	2 g	2 g	1 g
Magnesium Sulfate 50% IV (ml)								1.5 ml	2 ml	4 ml	4 ml	2 ml
Midazolam IV				0.5 mg	0.6 mg	0.75 mg	1 mg	1.5 mg	2 mg	2.5 mg	5 mg	2.5 mg
Midazolam IM / IN				1 mg	1.2 mg	1.5 mg	2 mg	3 mg	4 mg	5 mg	10 mg	5 mg

SYNCOPE / DIZZINESS: ADULT & PEDIATRIC MEDICAL PROTOCOL

Medical Society of Sedgwick County

M - 5

Effective 7-1-2012



POISONING / TOXIC INGESTION: ADULT & PEDIATRIC
MEDICAL PROTOCOL
Medical Society of Sedgwick County

V2.0 (10-1-14)

M - 6

Effective 7-1-2012

PEDIATRIC or ADULT ASSESSMENT Protocol (A – 1, A – 2)

Contact Poison Control **800-222-1222**

Ingestion?

NO (EXPOSURE) → Decontaminate: brush off powders, copiously irrigate all others. Consider HazMat response

YES ↓

Stimulant Ingestion?

NO → **Respiratory depression** with suspected narcotic ingestion?

YES ↓

BEHAVIORAL EMERGENCIES Protocol (M – 10)

NO → OPTIONS BASED ON ASSESSMENT

YES ↓

A — NALOXONE IV / IM / IN
Only if respirations depressed.
Listed dose is maximum dose.
Titrate IV dosing in increments of no more than 0.5mg
to achieve adequate respiratory effort and ability to protect airway

M — REQUEST ADDITIONAL ORDERS BASED ON ASSESSMENT

E
ADULT ONLY: Symptomatic organophosphate poisoning: **MARK 1 *or* DUODOTE IM**
May repeat x 2 if severe symptoms
NOTE: May be given on standing order for self / buddy care, no physician order required

P
- Symptomatic organophosphate poisoning: **ATROPINE IV / IM** repeat every 5 min x 3 if ongoing severe symptoms
- Magnesium toxicity ***or*** calcium channel blocker ingestion: **CALCIUM CHLORIDE 10% IV** over 10 minutes, may repeat x 1
- Hypotension due to beta blocker ***or*** calcium channel blocker ingestion: Premedicate with **ONDANSETRON IV** then give **GLUCAGON IV**
- Symptomatic suspected cyanide toxicity: **HYDROXOCOBALAMIN IV** over 15 min in dedicated IV line

OPTIONS BASED ON ASSESSMENT

A
- Dystonic reaction: **DIPHENHYDRAMINE IV / IM**
- Ingestion less than 1 hr PTA: **ACTIVATED CHARCOAL 25g PO**

P
Known tricyclic ingestion: **SODIUM BICARB IV** May repeat x 1 in 5 minutes if QRS > 0.12 persists

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	≥75 kg	Geriatric
Atropine IV/IM (organophosphate poisoning dose 0.05 mg/kg)	**0.25 mg**	**0.35 mg**	**0.45 mg**	**0.5 mg**	**0.6 mg**	**0.75 mg**	**1 mg**	**1.5 mg**	**2 mg**	**2 mg**	**2 mg**	**2 mg**
Calcium Chloride IV	**100 mg**	**150 mg**	**175 mg**	**200 mg**	**250 mg**	**300 mg**	**400 mg**	**600 mg**	**800 mg**	**1 g**	**1 g**	**1 g**
Calcium Chloride 10% IV	100 mg	150 mg	175 mg	200 mg	250 mg	300 mg	400 mg	600 mg	800 mg	1 g	1 g	1 g
Diphenhydramine IV					6.25 mg	6.25 mg	12.5 mg	12.5 mg	25 mg	50 mg	50 mg	12.5 mg
Diphenhydramine IM					12.5 mg	12.5 mg	25 mg	25 mg	50 mg	50 mg	50 mg	25 mg
Glucagon IV (for POISONING only)			0.6 mg	0.7 mg	0.8 mg	1 mg	1.5 mg	2 mg	3 mg	4 mg	4 mg	4 mg
Hydroxocobalamin IV	350 mg	500 mg	650 mg	700 mg	850 mg	1050 mg	1400 mg	2100 mg	2800 mg	5 g	5 g	**5 g**
Naloxone IV / IM / IN	0.5 mg	0.7 mg	1 mg	1 mg	1.2 mg	1.5 mg	2 mg	2 mg	2 mg	2 mg	2 mg	2 mg
Ondansetron IV							2 mg	3 mg	4 mg	4 mg	4 mg	4 mg
Sodium Bicarbonate IV				10 mEq	12 mEq	15 mEq	20 mEq	30 mEq	40 mEq	50 mEq	75 mEq	50 mEq

ADULT OR PEDIATRIC ASSESSMENT Protocol (A – 1, A – 2)

Hyperthermia? (T >104F)

Consider causes if not suspected to be due to environmental factors:
- Antipsychotic medications
- Major tranquilizers
- Cyclic antidepressants
- Amphetamines
- Monoamine oxidase inhibitors
- Anticholinergic drugs
- Illicit drugs

Cooling techniques (institute progressively as indicated):
Remove from hot environment
Remove clothing
Mist or sponge with water
Ice packs in axillae and/or groin

A	Normal saline IV if available

Hypothermia? (T ≤ 95°F)

Mild (90°-95°F / 32°-35°C)	**Moderate** (86°-90°F / 30°-32°C)	**Severe** (<86°F / 30°C)
amnesia, poor judgment, hyperventilation, bradycardia, shivering	loss of coordination (drunken appearance), decreasing rate and depth of respirations, shivering ceases or bradycardia	decreased LOC, slow respirations, atrial fibrillation, decreased BP, decreased heart rate, ventricular irritability

Cardiac arrest?

NO → Warming techniques:
Remove wet clothing
Cover with dry sheets, towels, warming blanket,
warm IV fluids if available

YES

Drowning?

YES → **SUBMERSION >90 MINUTES?***

NO → **CARDIAC ARREST: PEDIATRIC or ADULT Protocol (MC – 4, MC – 5)**

NO

YES → **TRAUMA CEASE RESUSCITATION Protocol (T – 3)**

NO → **CARDIAC ARREST: PEDIATRIC or ADULT Protocol (MC – 4, MC – 5)**

Modify standard protocol as follows:

	MODERATE hypothermia		**SEVERE** hypothermia
E	AED: shock as advised	**E**	AED: SINGLE shock ONLY if advised
A	Meds: double the time between doses	**A**	Meds: epinephrine ONLY, double the time between doses
P	Defibrillate as usual	**P**	Defib: SINGLE shock ONLY for VF/VT

***The chance of reviving a submersion victim generally declines over time based on the duration of submersion, although outcomes vary. A **relatively high percentage** of positive outcomes have been reported in cases of short-term submersion **under ten minutes**, with an increasing lower percentage as time goes on. The chance of recovering a revivable victim in time periods up to **60 minutes** may be **less than 5%** and in periods up to 90 minutes much less than that. The evidence is unclear for specific benchmarks. The commanders of search and rescue efforts are encouraged to balance any risks to rescuers against these facts.

PEDIATRIC OR ADULT ASSESSMENT Protocol (A – 1, A – 2)

Use other comfort measures to support patient (positioning, splinting)

Patient able to follow commands and protect airway?
- NO → Stabilize patient airway using appropriate protocol
- YES ↓

Patient with objective evidence of pain?
- NO → Medication therapy not indicated
- YES ↓

Patient with intraosseous access?
- NO → **Hemodynamically stable?** No signs of significant ongoing blood loss
  - NO → Stabilize patient hemodynamically using appropriate protocol
  - YES ↓
- YES ↓

P **LIDOCAINE 2% IO** for infusion pain, give first dose slow over 2 min, wait 1 min, then give second dose slow over 2 min. May repeat second dose only x 1 in 10 min

Patient on chronic narcotics? Greater than 1 week of treatment
- NO → **A** **FENTANYL IV / IM / IN** or **MORPHINE IV / IM**
  May repeat x 1 in 5-10 minutes if ongoing significant pain
  ↓
  A **ONDANSETRON IV** If needed for nausea
- YES ↓

M Medical Command for additional orders

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	≥75 kg	Geriatric
Fentanyl IV / IM				10 mcg	10 mcg	15 mcg	20 mcg	25 mcg	25 mcg	50 mcg	75 mcg	25 mcg
Fentanyl IN	10 mcg	15 mcg	20 mcg	20 mcg	25 mcg	30 mcg	40 mcg	50 mcg	50 mcg	100 mcg	100 mcg	50 mcg
Lidocaine 2% IO (for IO PAIN only) First dose	2 mg	4 mg	5 mg	5 mg	6 mg	8 mg	10 mg	15 mg	20 mg	40 mg	40 mg	40 mg
Lidocaine 2% IO (for IO PAIN only) Second and following doses	1 mg	2 mg	3 mg	3 mg	3 mg	4 mg	5 mg	8 mg	10 mg	20 mg	20 mg	20 mg
Lidocaine 2% IO (pain)	2 mg	4 mg	5 mg	5 mg	6 mg	8 mg	10 mg	15 mg	20 mg	20 mg	20 mg	20 mg
Morphine IV / IM	0.5 mg	0.7 mg	1 mg	1 mg	1.25 mg	1.5 mg	2 mg	3 mg	4 mg	4 mg	6 mg	2 mg
Ondansetron IV							2 mg	3 mg	4 mg	4 mg	4 mg	4 mg

NAUSEA / VOMITING: ADULT and PEDIATRIC
MEDICAL PROTOCOL
Medical Society of Sedgwick County

M - 9
Effective 7-1-2012

PEDIATRIC OR ADULT ASSESSMENT Protocol (A – 1, A – 2)

Medical antiemetic management indicated?
Altered mental status and vomiting or significant nausea and / or vomiting

NO → Supportive care

YES

Patient able to protect airway?

NO → Stabilize patient airway using appropriate protocol

YES

A **ONDANSETRON IV (PO)**
May repeat x 1 in 5 minutes for persistent nausea / vomiting

Vomiting?

NO → Supportive care

YES

≥ 12 years old?

NO (under 12) → Supportive care

YES

A **NORMAL SALINE IV bolus**

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	≥75 kg	Geriatric
Ondansetron IV							2 mg	3 mg	4 mg	4 mg	4 mg	4 mg
Normal Saline IV bolus (20 ml/kg)	100 ml	140 ml	180 ml	200 ml	240 ml	300 ml	400 ml	600 ml	800 ml	2 L	2 L	1 L

ADULT or PEDIATRIC ASSESSMENT Protocol (A – 1, A – 2)

Glucose > 50mg/dl?
- NO → **ALTERED MENTAL STATUS** Protocol (M – 1)
- YES ↓

Over 18 years of age?
- NO → **M** Request orders if between 12-18 years old and > 40 kg:
  HALOPERIDOL IV / IM
  MIDAZOLAM IV / IM / IN
  KETAMINE IV / IM
  LORAZEPAM IV / IM
- YES ↓

Over 65 years of age?
- NO → **OPTIONS BASED ON ASSESSMENT** **P**
  HALOPERIDOL IV / IM
  MIDAZOLAM IV / IM / IN
  KETAMINE IV / IM
  LORAZEPAM IV / IM
- YES ↓

P **HALOPERIDOL** IV / IM

Ongoing combative behavior after 10 minutes?
- YES → **M** Request orders for repeat dosing:
  LORAZEPAM IV / IM
  or **MIDAZOLAM** IV / IM / IN

Doses listed are maximum, less may be given	40-50 kg	50-74 kg	75-90 kg	>90 kg	Geriatric
Ketamine IM	100-200 mg	150-300 mg	200-400 mg	250 - 500 mg	
Ketamine IV	50-100 mg	75-150 mg	100-200 mg	125-250 mg	
Haloperidol IV	2.5 mg	5 mg	5 mg	5 mg	2.5 mg
Haloperidol IM	5 mg	10 mg	10 mg	10 mg	5 mg
Lorazepam IV / IM	2 mg	2 mg	2 mg	2 mg	1 mg
Midazolam IV	2 mg	2.5 mg	5 mg	5 mg	2.5 mg
Midazolam IM / IN	4 mg	5 mg	10 mg	10 mg	5 mg

RESPIRATORY DISTRESS: PEDIATRIC
MEDICAL PROTOCOL
Medical Society of Sedgwick County

V2.0 (8-15-12)

M - 11
Effective 9-28-2012

PEDIATRIC ASSESSMENT
Protocol (A – 1)

O2 to maintain saturations ≥ 94 %
or to improve air hunger

Inspiratory Stridor?

NO

YES

E **ALBUTEROL** 5 mg nebulized
Repeat as needed

A **ALBUTEROL** 6 mg with **IPRATROPIUM** 1 mg nebulized
Repeat as needed

Mild or moderate symptoms?
Patient with baseline mental status and
- No severe retractions
- Not in EXTREMIS due to bronchospasm
- No shark fin on waveform capnograph
- EtCO2 < 35 if increased RR
- Not hypoxic (≥ 94% on RA)

YES

NO (SEVERE)

Croup?

NO

Severe Bronchospasm?
History of asthma, previous intubation or ICU stay

YES

Humidified OXYGEN via nebulizer

YES

P **EPINEPHRINE 1:1000** IM

Stridor at rest?

NO

YES

OPTIONS BASED ON ASSESSMENT

P **METHYLPREDNISOLONE** IV
PREDNISONE PO

P **EPINEPHRINE 1:1000 neb**
< 4 yrs old: nebulize 2.5 mg (2.5 ml) diluted to total volume of 3 ml with saline
> 4 years old: 4 mg (4 ml) nebulized

M Medical Command for additional orders for patients in EXTREMIS
EPINEPHRINE 1:1000 IM
Repeat dose

P **METHYLPREDNISOLONE** IV

If suspected bacterial infection is the trigger for respiratory distress, (i.e. fever, decreased po intake, dehydration), withhold steroid therapy

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg
Epinephrine 1: 1000 SQ/IM	0.05 ml	0.07 ml	0.09 ml	0.1 ml	0.12 ml	0.15 ml	0.2 ml	0.3 ml	0.4 ml
Methylprednisolone	10 mg	14 mg	18 mg	20 mg	24 mg	30 mg	40 mg	62.5 mg	80 mg
Prednisone PO							20 mg	20 mg	40 mg

RESPIRATORY DISTRESS: ADULT MEDICAL PROTOCOL

Medical Society of Sedgwick County

V1.2 (7-1-13)

M - 12

Effective 7-1-2012

ADULT ASSESSMENT Protocol (A – 2)

Suspected bronchospasm?
(asthma, COPD) use EtCO2 if uncertain

NO (CHF, pneumonia)

O2 required to maintain saturations ≥ 94 %?

NO

YES

Supportive Care

YES

E **ALBUTEROL** 5 mg nebulized
Repeat as needed

A **ALBUTEROL** 6 mg with **IPRATROPIUM** 1 mg nebulized
Repeat as needed

A **Consider CPAP Procedure in patient with signs of respiratory failure and SBP > 90 mm Hg**

Suspected Pulmonary Edema?
(JVD, rales, peripheral edema)

NO

YES

OPTIONS BASED ON ASSESSMENT

A **CPAP Procedure: for Non-Asthmatic Patient ONLY**

P **PREDNISONE 60 mg po Or METHYLPREDNISOLONE 125 mg IV**

OPTIONS BASED ON ASSESSMENT

A **ALBUTEROL** 6 mg with **IPRATROPIUM** 1 mg nebulized
Up to 3 doses for bronchospasm

P **NITROGLYCERIN**
0.4 mg SL every 3 minutes up to 3 doses *or* 1-2 inches paste topical for significant hypertension or associated chest pain

Persistent severe symptoms?

NO (mild-moderate bronchospasm and/or improved with treatment)

YES

Severe Symptoms include

- Significant retractions
- EXTREMIS due to bronchospasm
- abnormal mental status
- shark fin waveform capnograph
- EtCO2 ≥ 35 with increased RR

P **MAGNESIUM SULFATE IV drip over 15 minutes**

Age over 50?

NO (under 50 yo)

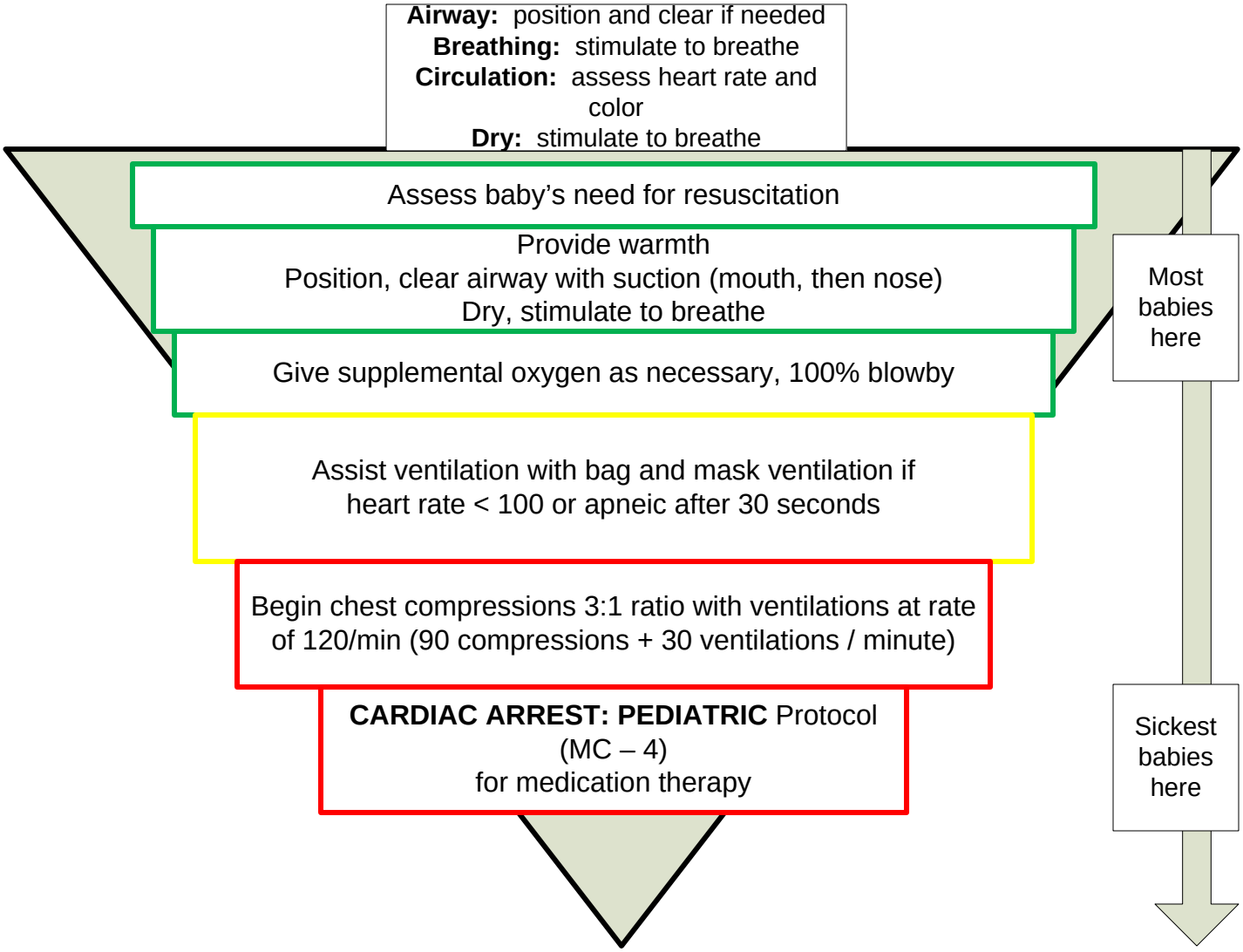
P **EPINEPHRINE 1:1000**
0.3 mg IM
Use with EXTREME CAUTION in patient with cardiac history

YES

M Medical command for additional orders

	50-74 kg	≥75 kg	Geriatric
Magnesium Sulfate IV	2 g	2 g	1 g
Magnesium Sulfate 50% IV (ml)	4 ml	4 ml	2 ml

NEONATAL RESUSCITATION TRIANGLE (from AHA):
Begin at top of triangle, **IF** infant does not stabilize (centrally pink, HR > 100, RR > 30), continue down triangle to next step.



APGAR scoring	0	1	2	
Appearance: skin color	Pale, cyanotic, blue	Pink body with blue extremities	Completely pink	
Pulse	Absent	< 100 bpm	> 100 bpm	
Grimace: reflex irritability	No response	Grimace	Cry, cough, sneeze	
Activity: muscle tone	Limp	Some flexion	Active motion	
Respiration	Absent	Slow (<30), irregular	Good, crying	

ACTIVE LABOR AND CHILDBIRTH MEDICAL PROTOCOL

Medical Society of Sedgwick County

M - 14

Effective 7-1-2012

ADULT ASSESSMENT Protocol (A – 2) including obstetric assessment points

Obstetric Assessment should include:

History: LMP, Estimated gestational age, G – P – A, any known complications of pregnancy currently or previously, is patient known high risk and why, single or multiple pregnancy, time of onset of labor, if ROM whether fluid was discolored, any vaginal bleeding or abdominal trauma?

Physical: Palpate abdomen during contractions, note length and frequency.

Suspected active labor?

NO → Transport in position of comfort, Ob kit with patient at all times

YES

Signs of crowning, need to push?

NO → Transport in position of comfort, Ob kit with patient at all times

YES—STAY AND DELIVER

Abnormal presentation?
Prolapsed cord, limb, or breech?

NO →

Normal delivery:

- Support head
- Protect perineum with clean towel to limit tearing
- After head delivers, support and suction mouth, then nose
- Check for umbilical cord around neck: if yes, double clamp and cut between clamps
- Provide gentle downward traction, deliver anterior shoulder, then upward to deliver posterior shoulder.
- Keep infant level with placental and double clamp cord about 8 inches from infant and cut between clamps
- Record time of birth
- Assess 1 and 5 minute APGAR scores

INFANT → **NEWBORN RESUSCITATION** Protocol (M – 13)

MOTHER → Massage uterus to limit bleeding and assist in placental separation. Deliver placenta if mother feels the need to push. Placenta does not need to be delivered prior to transport.

YES

Prolapsed cord or limb presentation:

- Maintain pressure on presenting part to decompress cord and maintain fetal circulation.
- Place mother in knee-chest (preferred) or Trendelenburg position.
- Place moist saline gauze on cord if external to vagina.

Breech presentation:

- Support buttocks until back appears.
- Provide gentle downward traction to hips, swinging right or left in direction of least resistance, allowing shoulders to deliver.
- Splint humerus to deliver arms.
- Engage head by gentle external uterine compression.
- Swing legs upward until body is vertical to permit delivery of head.

Rationale: To provide specific guidance on what History and Physical Exam components should be considered for inclusion in assessment of specific patient types. A careful patient assessment provides the basis for appropriate treatment interventions.

Indications: All patients in WSC EMSS will receive an appropriate patient assessment. See **DEFINITION OF A PATIENT** (R – 1) for who is considered a patient.

Contraindications/ Precautions: None

Necessary Monitoring

As dictated by assessment findings and **GENERAL/TRAUMA ASSESSMENT PROTOCOLS** (A – 1,2,3), available equipment on response unit (ALS vs. BLS) and provider certification level.

Considerations: The below is guidance and a "floor", it is not all-inclusive.

Procedure:

Adult Medical Patient:

1. Obtain Chief Complaint and History of Present Illness, including OPQRST Onset Type, Provocation, Quality, Radiation, Severity, Time of Onset. Include pertinent positives and negatives
2. Obtain SAMPLE History: Symptoms, Allergies, Medications--prescription and over-the-counter (include dose and bring all bottles if possible), Past Medical History, Last oral intake, Events leading up to 911 call
3. Perform appropriate Physical Exam elements for patient complaint
    a. Neuro: Alert to person-place-time-events, GCS, moves all extremities equally, Pupils-PEARL/size, Cincinnati Stroke Scale, altered vision, HA or dizziness, numbness, weakness, coordination problems. Inability to speak or enunciate is not the same as "altered mental status" or "unresponsive".
    b. Respiratory: Assess for apparent distress (work of breathing), accessory muscle use, tripoding, lung sounds, SpO_2
    c. Cardiovascular: Assess for skin color, temp and moisture, central vs. peripheral pulses (strength? congruent?), JVD, peripheral edema
    d. GI/GU: Assess for abdominal tenderness, soft or rigid (where), masses or pulsations, melanotic stool, blood or pain with urination, flank pain, polyuria, blood in urine, diarrhea?
    e. Musculoskeletal, skin: Assess for deformities as warranted, peripheral pulses, skin integrity (sores, ulcers, hives or rashes)
    f. Obstetric: If patient is suspected to be in active labor, disrobe patient, assess as needed for imminent delivery. Ob kit on stretcher at all times.
    g. Look for medic alert tags, medical apparatus (i.e. insulin pump, pacemaker) or other patient identifiers in unresponsive patient
4. Perform initial Vital Signs: LOC, BP, P, R, perfusion, oxygen saturation (prior to oxygen supplementation if at all possible). An initial manual BP should be used to correlate with automatic BP cuff. BP in both arms if appropriate. First response agencies should have at least one set of vital signs.
    a. Perform 12-lead ECG in patients with syncope, suspected cardiac chest pain, dysrhythmia or suspected ischemic equivalent as soon as possible.
    b. Perform capnography, Cincinnati stroke scale and assess pain scale (1-10) if indicated
    c. Provide supplemental oxygen if pulse oximetry < 92% on room air, patient with abnormal breathing, or signs of inadequate perfusion.
    d. Assess blood glucose if patient with altered level and/or diabetic.

e. Provide continuous monitoring as indicated. Patients with unstable vital signs should be on continuous cardiac monitoring and have repeat assessment and vital signs every 5-10 minutes. Stable patients should be reassessed at least once, with vital signs at least every 15 minutes.

5. Determine initial patient triage and provide to dispatch.
6. Attendant in charge prepare oral report for incoming transport unit, provide copy of initial written evaluation to transport unit. If initial AIC is not transporting patient, document time of transfer of care and name of provider assuming care.
7. Prealert dispatch for STEMI, Stroke, or Trauma alert as early as possible. See **RADIO TRAFFIC AND ALERTS** (R – 2) for specifics.
8. Perform ongoing / repeat assessment as indicated, note changes in triage level as appropriate.
9. Initiate vascular access if necessary for meds or IV fluids as per **PERIPHERAL VASCULAR ACCESS Procedure** (P – 40).
10. Repeat vital signs:
    a. Should be performed prior to hospital arrival.
    b. Each patient will have at least 2 sets of vital signs if patient contact time over 15 minutes.
    c. Critical patients should have critical vital signs monitored at least every 5 minutes.
    d. Pertinent vital signs should be repeated with significant status changes / interventions (i.e. med administration). Which vitals are critical depend on the complaint. For example, in respiratory patients the pulse (changes with meds and distress), respiratory rate, and oxygen saturation and potentially capnograph and capnometry are critical vitals.
    e. Significant status changes may include such things as: change in mentation, increase in pain, development of new symptoms (i.e. seizure), which should trigger a patient reassessment.
11. Reassess patient after each intervention and document response to treatment. Vital signs and pain scale may be appropriate items to include together with other critical vitals pertinent to patient complaint.

Pediatric Medical Patient (up to 8 years old or 40 kg):

1. Obtain Chief Complaint and History of Present Illness, including OPQRST Onset Type, Provocation, Quality, Radiation, Severity, Time of Onset. Include pertinent positives and negatives.
2. Obtain SAMPLE History: Symptoms, Allergies, Medications--prescription and over-the-counter (include dose and bring all bottles if possible), Past Medical History, Last oral intake, Events leading up to 911 call.
    a. For under 6 months old, include: birth history (any problems with pregnancy? Did baby go home with mom or stay in hospital/ICU? Intubated? Premature?)
    b. For all pediatrics include: immunization history (are shots up to date?), number of wet diapers/urine output, oral intake?
3. Perform appropriate Physical Exam elements for patient complaint
    a. Neuro: Response to parent/strangers and appropriateness, alertness, Pupils- PEARL, weakness, coordination problems
    b. Respiratory: Assess for apparent distress (work of breathing), accessory muscle use, lung sounds, stridor, cough, SpO_2
    c. Cardiovascular: Assess for skin color, temp and moisture, central vs. peripheral pulses (strength? congruent?), cap refill time
    d. GI/GU: Assess for abdominal tenderness, soft or rigid (where), masses, blood or different appearance/odor of stool, diarrhea?
    e. Musculoskeletal, skin: Assess for deformities as warranted, peripheral pulses, skin integrity (sores, hives, bruises or rashes), fontanels, mucus membranes moist
    f. Look for medical apparatus (gastric tube, trach, PICC line)

4. Perform initial Vital Signs: LOC, P, R, perfusion, oxygen saturation (prior to oxygen supplementation if at all possible), weight if medication administration expected.
    a. Determine and note Broselow tape color if critical (red) patient or for any patient to whom meds will be administered. This tape color should correspond to the weight and any med doses you give. If there is a difference between the weight provided by mom and the length-based resuscitation tape, the actual patient weight is preferred to choose the correct color and direct medication dosing.
    b. Maintain body temperature. If febrile, do not bundle in clothing. "Normal" ranges for afebrile patients are below.

Age	P/min Avg	P/min Range	Resp/min
Birth-3 mo	140	85-205	30-60
3 mo-2 yr	130	100-190	24-40
2-10 yr	80	60-140	18-30
>10 yr	75	60-100	12-16

    c. Perform capnography, assess pain scale if indicated.
    d. Assess blood glucose if patient with altered level and/or diabetic. Heelstick is preferable for checking glucose in infants.
    e. Provide supplemental oxygen if pulse oximetry < = 92% on room air or patient with abnormal breathing. Consider assisting ventilation if signs of inadequate ventilation, altered mental status, or signs of inadequate perfusion are present.
    f. Provide continuous monitoring as indicated. Patients with unstable vital signs should be on continuous cardiac monitoring and have repeat assessment and vital signs every 5-10 minutes. Stable patients should be reassessed at least once, with vital signs at least every 15 minutes.
5. Determine initial patient triage and provide to dispatch.
6. Attendant in charge prepare oral report for incoming transport unit, provide copy of initial written evaluation to transport unit. If initial AIC is not transporting patient, document time of transfer of care and name of provider assuming care.
7. Prealert receiving hospital of any Code Red patient, including: (1) Complaint (2) Brief assessment, vitals if available (3) Treatments (4) ETA
8. Perform reassessment as indicated.
9. Initiate vascular access if necessary for meds or IV fluids as per **PERIPHERAL VASCULAR ACCESS Procedure** (P – 40).
10. Repeat vital signs:
    a. Should be performed prior to hospital arrival.
    b. Each patient will have at least 2 sets of vital signs if patient contact time over 15 minutes.
    c. Critical patients should have critical vital signs monitored at least every 5 minutes.
    d. Pertinent vital signs should be repeated with significant status changes / interventions (i.e. med administration). Which vitals are critical depend on the complaint. For example, in respiratory patients the pulse (changes with meds and distress), respiratory rate, and oxygen saturation and potentially capnograph and capnometry are critical vitals.
    e. Significant status changes may include such things as: change in mentation, increase in pain, development of new symptoms (i.e. seizure), which should trigger a patient reassessment.
11. Reassess patient after each intervention and document response to treatment. Vital signs and pain scale may be appropriate items to include.

Trauma patient:

1. Determine number and priority of patients and hospital destination and provide appropriate prealerts. Establish Medical Branch if appropriate.
2. Evaluate mechanism of injury.
3. Perform Initial Assessment (< 1 minute)
    a. General Impression: general appearance, position, obvious injuries, *evidence of life-threatening bleeding*, skin color, purposeful movement
    b. LOC: AVPU, patient's chief complaint
    c. Airway (with Cspine stabilization): any snoring, gurgling, stridor, or silence?
    d. Breathing: *present?* Rate, depth, effort
    e. Circulation: *radial / carotid pulses present? Is bleeding controlled now?* Rate, rhythm, quality, skin color, temperature, cap refill.
    f. Fix any life threatening problems found in the initial assessment before proceeding.
4. If load-and-go patient, expedite appropriate patient packaging and transport.
5. Prealert dispatch for Trauma alert as early as possible. See **RADIO TRAFFIC AND ALERTS** (R – 2) for specifics.
6. Request any necessary additional resources as per agency policy. If patient is critical, weigh time and patient care benefit of waiting for additional resources on scene vs. rapid transport to definitive care.
7. Evaluate need for **SPINAL MOTION RESTRICTION Protocol (T – 2), SPINAL IMMOBILIZATION Procedure (P – 22)** and/or **SPLINTING Procedure** (P – 24) as clinically indicated. If patient meets criteria not to have spinal immobilization, document appropriately that the patient meets the specific criteria to make this decision.
8. Supplemental oxygen should be applied early with significant mechanism of injury.
9. In critical patient, with significant mechanism of injury, proactive patient management should occur simultaneously with assessment. To facilitate this, one provider should be assigned exclusively to monitor and facilitate patient-focused care whenever possible. Management, based on patient assessment, may include necessary interventions, but should not impede extrication or transport to definitive care. Potential examples include: oxygen supplementation, suction, IV/IO initiation and fluid resuscitation, pain management for painful or prolonged patient extrication.
10. In patient with significant or generalized mechanism of injury, expose patient as appropriate to facilitate complete physical exam. Cover patient again to maintain body temperature and patient modesty as soon as practical.
11. Determine appropriate exam: Focused Exam or Rapid Trauma Survey
    a. Rapid Trauma Survey:
        i. Head and Neck: Wounds, neck vein distension, tracheal deviation?
        ii. Chest: asymmetry, contusions, penetrations, tenderness, instability, crepitation
            1. Breath sounds: present? Equal?
            2. Heart tones: distant / muffled?
        iii. Abdomen: contusions, penetration, evisceration, tenderness, rigidity, distention
        iv. Pelvis: tenderness, instability, crepitation. DO NOT ROCK pelvis, DO NOT repeatedly move a known fractured pelvis any more than absolutely necessary.
        v. Upper / Lower Extremities: obvious swelling, deformity. Distal pulse? Distal movement and sensation?
        vi. Posterior: obvious wounds, tenderness, deformity.
    b. Focused Exam:
        i. Exam of identified injury
        ii. Exam of spine to evaluate need for spinal immobilization
12. Obtain History of Present Illness,
    a. **OPQRST** Onset Type, Provocation, Quality, Radiation, Severity, Time of Onset. Include pertinent positives and negatives.

b. **SAMPLE** History: Symptoms, Allergies, Medications-prescription and over-the-counter (include dose and bring all containers if possible), Past Medical History, Last oral intake, Events leading up to 911 call
c. Look for medic alert tags, medical apparatus (i.e. insulin pump, pacemaker, dialysis shunt or central line) or other patient identifiers in unresponsive patient

13. Perform initial Vital Signs: LOC, P, R, perfusion, oxygen saturation (prior to oxygen supplementation if at all possible).
    a. Maintain body temperature.
    b. Perform capnography, assess pain scale if indicated.
    c. Assess blood glucose if patient with altered level and/or diabetic.
    d. Provide supplemental oxygen if pulse oximetry < = 92% on room air or patient with abnormal breathing. Consider assisting ventilation if signs of inadequate ventilation, altered mental status, or signs of inadequate perfusion are present.
    e. Provide continuous monitoring as indicated. Patients with unstable vital signs should be on continuous cardiac monitoring and have repeat assessment and vital signs every 5-10 minutes. Stable patients should be reassessed at least once, with vital signs at least every 15 minutes.
14. Determine initial patient triage and provide to dispatch.
15. Perform full vital signs: LOC, BP, P, R, perfusion, oxygen saturation (prior to oxygen supplementation if possible). An initial manual BP should be used to correlate with automatic BP cuff. Assess pain scale (1-10) if indicated or if pain management anticipated. Place appropriate monitoring equipment (pulse ox, cardiac monitor, NIBP) as appropriate to patient condition.
16. Provide supplemental oxygen if pulse oximetry < 92% on room air, head injury, abnormal breathing, or signs of inadequate perfusion.
17. Provide brief report to hospital with pertinent positives, preferably prior to initiating IVs etc—early notification of trauma alerts is more important than being able to tell them you have an IV.
18. Attendant in charge prepare oral report for incoming transport unit, provide copy of initial written evaluation to transport unit. If initial AIC is not transporting patient, document time of transfer of care and name of provider assuming care.
19. Initiate vascular access if necessary for meds or IV fluids as per **PERIPHERAL VASCULAR ACCESS Procedure** (P – 40).
20. Repeat vital signs:
    a. Should be performed prior to hospital arrival.
    b. Each patient will have at least 2 sets of vital signs if patient contact time over 15 minutes.
    c. Critical patients should have critical vital signs monitored at least every 5 minutes.
    d. Pertinent vital signs should be repeated with significant status changes / interventions (i.e. med administration). Which vitals are critical depend on the complaint. For example, in respiratory patients the pulse (changes with meds and distress), respiratory rate, and oxygen saturation and potentially capnograph and capnometry are critical vitals.
    e. Significant status changes may include such things as: change in mentation, increase in pain, development of new symptoms (i.e. seizure), which should trigger a patient reassessment.
21. Perform ongoing / repeat assessment as indicated, note changes in triage level as appropriate. Reassess patient after each intervention and document response to treatment. Vital signs and pain scale may be appropriate items to include together with other critical vitals pertinent to patient complaint.

Obstetric patient

1. Obtain Chief Complaint and History of Present Illness, including OPQRST Onset Type, Provocation, Quality, Radiation, Severity, Time of Onset. Include pertinent positives and negatives
2. Obtain SAMPLE History: Symptoms, Allergies, Medications, especially narcotic or drug use (legal or illegal) and last use, Past Medical History, Last oral intake, Events leading up to 911 call. Include:
    a. first day of last menstrual period,
    b. estimated weeks gestation (if < 15 weeks, whether she has an ultrasound-documented intrauterine pregnancy)
    c. Gravida (number of pregnancies including this one), Para (number of deliveries regardless of number of infants delivered), Abortus (number of previous miscarriage / abortions) and any complications of any pregnancy,
    d. whether patient has any known complications with the current pregnancy,
    e. whether this is a single or multiple pregnancy
    f. time of onset of labor, whether membranes have ruptured (and when), whether there was discoloration of amniotic fluid
    g. any vaginal bleeding? Any trauma that caused bleeding or pain associated with bleeding?
3. Sensation of fetal movement / activity?
4. Perform initial Vital Signs: LOC, BP, P, R, perfusion
5. Provide supplemental oxygen if patient in active labor.
6. Perform appropriate medical assessment
7. Obstetric assessment:
    a. Palpate abdomen during contractions (abdomen hardens), time length and frequency of contractions, note if they are regular
    b. If patient feels urge to push or need to have bowel movement, evaluate perineum for signs of crowning/imminent delivery
    c. If patient is crowning, or delivery is imminent, deliver infant before transport.
    d. Have Ob kit, oxygen, towel/sheet and pediatric BVM with patient at all times if patient in active labor
8. Provide continuous monitoring as indicated. Patients with unstable vital signs should be on cardiac monitor at a minimum, with repeat vital signs every 5-10 minutes. Stable patients should be reassessed at least once, with vital signs at least every 15 minutes.
9. **Prealert if needed for rapid fetal assessment or active labor** of any patient over 20 weeks gestation. Include:
    a. Pt age
    b. G # (gravida—number of times pregnant) P # (para—number of times delivered, which is not the same as number of babies) A # (abortus—number of times pregnancy not carried to delivery of live infant, whether abortion or miscarriage)
    c. Assessment including weeks of gestation, time of onset of labor, frequency of contractions, any bleeding, whether membranes ruptured
    d. Name of patient's Ob/Gyn if available
    e. Treatments
    f. ETA.
    g. **Note if patient Code Red** (gestation < 36 weeks in active labor, known abnormal presentation (breech, etc), known prenatal complications, distressed neonate delivered in field)
10. Perform ongoing assessment as indicated, including pain scale.
11. Perform repeat vital signs prior to hospital arrival. Each patient will have at least 2 sets of vital signs if patient contact time over 15 minutes.

Rationale:

To provide guidance on appropriate documentation of patient care.

Expectation:

- All patients (defined in **DEFINITION OF A PATIENT**, R – 1) will have their assessment and management fully and accurately documented in a timely manner using the documentation tools provided by their agency. The expectation is that there is some type of record available no later than the end of the provider's shift. Vital information will be communicated to the hospital verbally and in writing at the time of patient turnover. This should include initial, significant, and final vital signs, ECG tracings, pertinent history and physical exam findings, and treatments provided. The final form of the narrative and patient care portion of the record should be available within 24 hours.
- To facilitate quality reviews, specific points as below are offered as guidance to be included in all patient records as noted below.
- If an individual is evaluated and determined not to meet the definition of "patient", the evaluation and description of the situation that supports this determination will be captured in patient care documentation.
- If you did not assess something, either delete that element (HealthEMS or FireHouse) so it does not become part of the auto-generated narrative, or if that is not possible in your patient care reporting mechanism, note "not assessed". Do not write "n/a" which means "not applicable".
- For procedures (i.e. airway), the individual performing the procedure will be held responsible for the quality of the procedure documentation. If you do not do the documentation, you are still expected to review it to assure accuracy and completeness and make appropriate addenda if needed.

Job aid:

An adequate written patient report includes the following minimal elements, whose potential elements are further described in **PATIENT ASSESSMENT Procedure**, **P - 1**

1. Chief Complaint including pertinent dispatch information, as well as info received from other sources (bystanders, police—which should be attributed or quoted as appropriate).
2. History of Present Illness: including OPQRST (Onset Type, Provocation, Quality, Radiation, Severity, Time of Onset). Include pertinent positives and negatives. This should also include description of unusual circumstances that are pertinent.
3. SAMPLE History: Symptoms, Allergies, Medications, Past Medical History, Last oral intake, Events leading up to 911 call
4. Physical Exam appropriate to patient complaint. This should also include your observations of other pertinent things on scene. Be as specific as possible in your description, i.e., sensation intact to light touch distally in both lower extremities vs. sensation normal or normal neuro). HEENT, Neck, Chest, Abdomen, Pelvis, Posterior, Extremities. General neuro assessment (AVPU preferred, may use GCS).
5. Vital Signs: In almost every patient should include LOC, BP, P, R, perfusion, oxygen saturation (prior to oxygen supplementation if possible).
    a. For first response agencies, there should be at least one set of vital signs if they arrive prior to SCEMS.
    b. For EMS, there should be at least 2 full sets of vital signs for every patient, or an explanation why that was not possible.

   c. Stable patients should receive vitals at least every 15 minutes or with significant status changes / interventions, critical patients should have their critical vitals monitored at least every 5 minutes or with significant status changes / interventions. Vital signs should be recorded within 5 minutes of patient turnover at hospital. If an invasive airway is placed, capnography waveform should be recorded with each patient movement, including prior to patient movement from ambulance at hospital and again at hospital bedside at time of turnover.
   d. A significant status change may be a change in mentation, increase in pain, development of new symptoms (seizure). Which vitals are critical depend on the complaint—respiratory patients the pulse (changes with meds and distress), respiratory rate, breath sounds and oxygen saturation and potentially capnograph and capnometry are critical.
   e. Downloaded vital signs (including BP, P, EtCO2, SaO2) from monitors should be checked and corrected if they are wrong, or conflicts explained in your narrative. For example, in a cardiac arrest, if the pulse reads "108" due to CPR, it must be corrected to "0" because the patient was pulseless.
6. Additional assessment findings as appropriate may include:
   a. 12-lead ECG if indicated (syncope, suspected cardiac chest pain, dysrhythmia or suspected ischemic equivalent)
   b. Glucometry (altered mental status, symptoms of hypoglycemia or hyperglycemia)
   c. Capnography, Cincinnati stroke scale, Pain scale (1-10) if indicated
7. Provider assessment: what you thought was wrong with the patient and what protocol(s) you followed. Include initial triage level here.
8. Interventions performed. Medications, Procedures, Alert: STEMI, Stroke, or Trauma, etc.
   a. If specific treatments are offered that the patient declined, document specifically what was offered, what specifically was explained to the patient regarding the need for the interventions and the specific risks/benefits of refusal of that treatment.
   b. For refusal of transport, names of witness (preferably not EMS) to this counseling should be included, as well as that patient was offered the opportunity to recontact EMS should they change their mind and decided they wished service. Explain patient's reason for declining care / transport. Document discussions with medical command and orders given or denied. If someone stays with the patient who could assist the patient in calling for help later, note this as well.
9. Reassessment following interventions (did it help or not? How could you tell?)
10. Turnover: note that verbal (or written) report was given, to whom patient was turned over to and when, and what vital information was provided.
11. Review the written record to assure it paints an accurate picture of the events of the call, and that there are no conflicts between the downloaded information from the monitor and the narrative.

Job aid:

An adequate oral patient report (from first responder to ALS, from ALS to hospital) includes the following minimal elements for in-person communication. For radio traffic, refer to information from Radio Traffic Academy:

1. Patient age, gender, Triage level
2. Provider assessment of problem.
3. History of Present Illness: pertinent ONLY: positives and negatives, SAMPLE, any unusual circumstances
4. Physical Exam: pertinent ONLY

5. Vital Signs: Most recent, and pertinent prior (i.e. if BP was 70 to start and it's 110 now, include both)
6. Interventions performed and patient response.

The following guidance provides both general and specific guidance on written documentation. The written patient care report should support all of the following items:

a. That the GENERAL ASSESSMENT – PEDIATRIC (A - 1), GENERAL ASSESSMENT – ADULT (A - 2) or TRAUMA ASSESSMENT (A - 3) Protocols and PATIENT ASSESSMENT Procedure (P – 1) were applied

b. What treatment was provided, and for what reason. Any medical command orders requested / granted. Patient status and ending vital signs at turnover to another provider.

c. That there was reassessment following treatment to evaluate response to treatment (i.e. decreased dyspnea, increased O2 sat, decreased pain scale, improved blood glucose, etc)

d. Narrative documentation should include the following minimum additional information for specific protocols:

MC1. Acute Coronary Syndrome

1. OPQRST and SAMPLE
    a. Cardiac risks: hypertension, diabetes, smoking, family history (< age 55 family with MI)
    b. Prior cardiac history? Are symptoms the same or different? Any recent cardiac evaluation (stress test, cath) and results
    c. Name of cardiologist if applicable
    d. Nitro: If prescribed nitro, when was the last time it was taken? If given by EMS, did it help?
    e. Exertional (what level?) vs. pain at rest?
    f. Radiation and to where?
    g. Associated symptoms: dyspnea, diaphoresis, nausea?
2. Aspirin given since 911 called (Y / N)? Contraindication if any? Note "PTA" if appropriate.
3. Treatments:
    a. 12-lead ECG performed within 10 minutes of contact and findings
    b. Aspirin prior to transport (document if given PTA by FD or dispatch)
    c. If STEMI
        i. STEMI alert time--within 5 minutes of 12-lead performed
        ii. Defib patches placed
4. Reassessments: Pain scale, repeat vital signs

MC2. Bradycardia – Adult

1. What criteria made patient unstable / symptomatic (or not) and needing intervention: signs of inadequate perfusion due to bradycardia—hypotension/shock, altered mental status, ischemic chest pain, new/worsened CHF.
2. Accurate medication list, including meds that may promote conduction delays such as beta blockers, calcium channel blockers, digoxin.
3. 12-lead ECG documented and interpretation

   a. STEMI or not?
   b. High grade block?
   c. Heart transplant?
4. Weight if dopamine drip initiated (since it is a weight-based dosing).
   a. What endpoint drip was titrated to, and final dose rate (mcg/kg/min) at turnover together with turnover vital signs.
5. Procedure documentation of pacing if used (see Procedure section).

MC3. Tachycardia – Adult

1. What criteria made patient unstable / symptomatic (or not) and needing intervention: signs of inadequate perfusion due to tachycardia—hypotension/shock, altered mental status, ischemic chest pain, new/worsened CHF.
   a. If HR > 150 and that is thought due to a non-cardiac cause, explain (i.e. fever / sepsis, hypovolemia, heat illness)
   b. Known prior dysrhythmia and what medication (dose?) stopped it in the past
2. Accurate medication list, including meds that affect conduction or antiarrhythmics
3. 12-lead ECG documented and interpretation including
   a. QRS wide?
   b. Rhythm regular?
4. If electrical therapy required, document that sedation and analgesia considered and if NOT given, why.
5. Procedure documentation of electrical therapy if used (see Procedure section).

MC4. Cardiac Arrest – Pediatric

1. Events prior to onset
2. Description / location of patient on arrival
3. Last time seen alive, estimated down time
4. Presence of DNR documentation (note whether valid or not, date executed, and physician name if you can read it) or DPOA (name, relationship to patient)
5. Bystander CPR or not
6. When CCR was used and when switched to CPR if applicable.
7. Medical history including any equipment, recent hospitalization or illness. Name of primary care physician.
8. Broselow tape color or weight used for medication dosing (and where this weight was obtained from)
9. Any rhythm changes during resuscitation effort and for approximately how long.
10. Waveform capnography if invasive airway, including initial reading and shape of waveform (i.e., normal, sharkfin).
11. Indications for OPTIONS BASED ON ASSESSMENT that you implemented.
    + MC6 Post Resuscitation
    + MC9 Medical Cease Resuscitation
    + any procedures (airway, vascular access)

MC5. Cardiac Arrest – Adult

1. Events prior to onset
2. Description / location of patient on arrival
3. Last time seen alive, estimated down time

4. Presence of DNR documentation (note whether valid or not, date executed, and physician name if you can read it) or DPOA (name, relationship to patient)
5. Bystander CPR or not
6. When CCR was used and when switched to CPR if applicable.
7. Medical history including any equipment, recent hospitalization or illness. Name of primary care physician.
8. Any rhythm changes during resuscitation effort and for approximately how long. This can be documented as an event which identifies the rhythm during each CPR pause
9. Waveform capnography if invasive airway, including initial reading and shape of waveform (i.e., normal, sharkfin).
10. Indications for OPTIONS BASED ON ASSESSMENT that you implemented.

+ MC6 Post Resuscitation
+ MC9 Medical Cease Resuscitation
+ any procedures (airway, vascular access)

MC6 Post Resuscitation

1. Pediatric:
    a. Time of ROSC and initial ROSC rhythm
    b. Post-resuscitation vital signs and 12-lead
    c. That ventilation was optimized: what EtCO2 was and what was done to work toward goal of 35-45, or why it was felt that goal was not appropriate.
    d. That there was adequate vascular access
    e. That perfusion was optimized, or what interventions were performed to assure optimized perfusion
    f. Whether patient could follow commands, whether there was need for sedation
    g. Whether warmed saline was initiated if trauma
    h. Indications for OPTIONS BASED ON ASSESSMENT that you implemented.
    i. Weight if epinephrine drip initiated (since it is a weight-based dosing).
    j. What endpoint drip was titrated to, and final dose rate (mcg/kg/min) at turnover together with turnover vital signs.
2. Adult
    a. Time of ROSC and initial ROSC rhythm
    b. Post-resuscitation vital signs and 12-lead
    c. That ventilation was optimized: what EtCO2 was and what was done to work toward goal of 35-45, or why it was felt that goal was not appropriate (i.e. respiratory arrest leading to cardiac arrest in COPD patient with initial EtCO2 of 120, adequate tidal volume administered at RR 18 to avoid hyperinflation, ending EtCO2 76).
    d. That there was adequate vascular access
    e. That perfusion was optimized, or what interventions were performed to assure optimized perfusion
    f. Whether patient could follow commands, whether there was need for sedation
    g. Whether chilled saline was initiated if medical or warmed saline if trauma.
    h. Indications for OPTIONS BASED ON ASSESSMENT that you implemented.
    i. 12-lead ECG
    j. Weight if dopamine drip initiated (since it is a weight-based dosing).
    k. What endpoint drip was titrated to, and final dose rate (mcg/kg/min) at turnover together with turnover vital signs.

MC7. Tachycardia – Pediatric

1. What criteria made patient unstable / symptomatic (or not) and needing intervention: signs of inadequate perfusion due to tachycardia—hypotension/shock, altered mental status
    a. If HR > 180 / 220 and that is thought due to a non-cardiac cause, explain (i.e. fever / sepsis, hypovolemia)
    b. Lack of rate variability
    c. Known prior dysrhythmia and what medication (dose?) stopped it in the past
2. Accurate medication list, including meds that affect conduction or antiarrhythmics
3. 12-lead ECG documented and interpretation including
    a. QRS wide?
    b. Rhythm regular?
4. If electrical therapy required, document that sedation and analgesia considered and if NOT given, why.

MC8. Bradycardia – Pediatric

1. What criteria made patient unstable / symptomatic (or not) and needing intervention
    a. what signs of inadequate perfusion due to bradycardia—hypotension/shock, altered mental status,
    b. why bradycardia felt to be primarily cardiac in origin
2. Accurate medication list, including meds that may promote conduction delays such as beta blockers, calcium channel blockers, digoxin.
3. 12-lead ECG documented and interpretation

MC9 Medical Cease Resuscitation

1. Pediatric:
    a. Criteria met:
        i. Normothermic
        ii. Adequate CPR
        iii. Adequate airway management
        iv. Rhythm-appropriate medications administered, H & T treated
        v. Rhythm:
            a) Asystole or agonal rhythm (without reversible causes) present throughout. Cease resuscitation at no less than **30 minutes** of adequate resuscitative effort.
            b) At least 15 min of asystole before cease resuscitation implemented if rhythm changes.
        vi. Failure to establish and sustain ROSC at any time or for > 5 minutes
        vii. EtCO2 persistently <10 with adequate CPR. If EtCO2 higher, explain why resuscitation not continued,
    b. Time of death, whether by standing order or provide specific physician name.
    c. Released to PD unit # --, coroner or physician notification if applicable
    d. Position / location of body, any movement of body made by EMS
    e. Any injuries noted
    f. If no resuscitation attempted, that pt was pulseless and apneic with:
        i. Rigor mortis
        ii. Decomposition

iii. Valid DNR or TPOPP (provide date and name of physician if legible)
iv. > 15 min downtime and no bystander CPR and initial rhythm asystole

2. Adult: As above except in a.v.(a) Cease resuscitation at no less than **20 minutes** of adequate resuscitative effort.

TRAUMA

T2. Spinal Motion Restriction

1. Mechanism of injury: does not meet high risk criteria (ejection from vehicle, motorcycle crash > 20 mph, auto vs. ped or bike at > 20mph, axial load to head, fall from 3x patient's height), or note if penetrating trauma without neuro deficit.
2. Patient meets all criteria to be reliable and competent:
    a. Normal level of alertness
    b. No evidence of clinical intoxication
    c. No distracting injury
    d. Able to communicate adequately (i.e., no language barrier)
3. Lack of point tenderness on palpation of entire length of spinous processes
4. Lack of focal deficit (motor or sensory) on neuro exam

T3. Trauma Cease Resuscitation

1. Patient normothermic?
2. Medical etiology considered?
3. Specific findings that are incompatible with life?
    a. Decapitation
    b. Decomposition
    c. Incineration
    d. Rigor mortis
    e. GSW head that crosses midline (brain matter visible?)
    f. Submersion for > 30 minutes (possible exception pediatric cold water)
4. Pulseless and apneic on first provider arrival
5. Basic resuscitative efforts provided
    a. Airway opened (+ suction or BLS airway)
        i. Any spontaneous respirations after BLS intervention?
    b. Ventilations initiated
    c. CPR initiated
6. Any mechanism / suspicion for tension pneumothorax (i.e. blunt or penetrating chest injury), if yes, response to chest decompression
7. Initial cardiac rhythm on monitor (organized? PEA<40?), any change with basic resuscitative efforts or chest decompression if indicated?
8. Cease resuscitation time if protocol applied.

MEDICAL

M1. Altered Mental Status

1. ETOH / Substance use history
2. No evidence of obvious trauma noted
3. Blood glucose level. If low, history of diabetes? If diabetic:
    a. Use of insulin vs. oral agent? Last dose of meds?

   b. Etiology of hypoglycemia: missed meal? Increased exercise? Vomiting / nausea / recent illness?
   c. Post-treatment reassessment of mental status and verification of baseline
4. Baseline mental status for patient (per whom?)
5. Other potential causes (AEIOUTIPS), EtCO2 in patient with COPD
6. Evidence of dehydration or elevated temp?

M2. Acute Stroke

1. Time last seen normal
2. Which new positive Cincinnati Stroke Scale findings
3. Blood glucose
4. Contact information for witness if that individual was not transported with patient.
5. Stroke alert activation time
6. Any change in status during EMS care

M3. Allergy / Anaphylaxis

1. Cause of reaction, time from exposure to onset
2. Prior similar reactions?
3. Presence / absence of specific signs of allergic reaction or anaphylaxis
   a. Dyspnea, stridor, altered voice
   b. Facial / airway (tongue, lips) edema
   c. Chest Pain
   d. Urticarial rash or hives, itching
   e. Mental status

M4. Seizure

1. Obvious injuries (mouth, head, tongue) due to seizure, or evidence of head trauma that may have caused seizure in patient with no history of seizure
2. Duration and number of seizures, whether patient fully regained consciousness between seizures (i.e. does pt meet criteria for status epilepticus?)
3. Time to return to baseline LOC
4. Prior history of seizures—same type? Any medications / drug use? Last time pt had breakthrough seizure?
5. Etiology of seizure: Medication noncompliance? Alcohol withdrawal? New meds that lower seizure threshold?

M5. Syncope / Dizziness

1. Symptoms leading up to event:
   a. Activity (i.e., standing up, turning head to one side, working outdoors, prolonged kneeling in church,)
   b. Recent illness (i.e., history of vomit / diarrhea to cause dehydration, GI bleed)
2. Associated:
   a. Chest pain, dyspnea, nausea
   b. Neurologic symptoms: headache, focal weakness, slurred speech, visual changes, sensory changes
   c. Vertigo (room spinning)? vs. dizzy (feel lightheaded)?
3. Medications: any new meds?
4. Last meal

5. Blood glucose level
6. 12-lead ECG
7. In females of childbearing age: possibility of pregnancy? Last menstrual period?

M6. Toxic Ingestion / Exposure

1. Name of substance (note MSDS # if applicable)
2. Ingestion:
    a. Amount taken, route, and approximate time ingested
    b. Vomit since ingestion? Pills noted in vomitus?
    c. Intentional vs. accidental ingestion? History of same if intentional
    d. Oral mucosa burns?
3. Exposure (toxic gas / smoke / liquid / solid):
    a. Enclosed space?
    b. Length of exposure time?
    c. Associated signs / symptoms (i.e., singed hairs, burns)
4. Systemic symptoms? Toxidrome?
    a. Opioid
        i. CNS depression, pupil constriction, respiratory depression
        ii. Hypothermia, bradycardia, respiratory arrest, flash pulmonary edema
    b. Sympathomimetic (amphetamine, cocaine)
        i. Agitation, pupil dilatation, diaphoresis, tachycardia, hypertension, hyperthermia
        ii. Seizure, MI, cardiac arrest.
    c. Cholinergic (organophosphate)
        i. Wet: Salivation, lacrimation, diaphoresis, nausea, vomiting, urination, defecation, bronchorrhea, weakness
        ii. Bradycardia, respiratory failure, paralysis, seizures
    d. Anticholinergic
        i. Dry: hot as a hare, dry as a bone, mad as a hatter: hyperthermia, dry skin/membranes, altered mental status, dilated pupils, urinary retention
        ii. Seizures, dysrhythmia, death from hyperthermia and dysrhythmia
    e. Serotonin (SSRI's): Altered mental status, increased muscle tone, hyperreflexia, hyperthermia
5. Documentation of contact with poison control (time) and their recommendation for transport or specific intervention.
6. Any patient statements regarding intent for harm to self or others (preferably in quotes)

M7. Environmental Emergencies

1. Circumstances of exposure:
    a. Suspected etiology
    b. Symptoms
2. Temperature if available, or category of hypothermia being treated (mild-moderate-severe)
3. Any decontamination that was performed

M8. Pain Management

1. Indication for pain management
2. Which comfort measures provided (positioning, splinting)
3. Objective evidence of pain noted (i.e., elevated BP, P, visible bony deformity)

4. Patient able to follow commands / hemodynamically stable
5. Chronic narcotic therapy?
6. Initial pain scale, pain scale following treatment

M9. Nausea / Vomiting

1. Medical indication for antiemetic treatment: i.e. altered mental status with vomiting, intractable vomiting, severe nausea/vomiting

M10. Behavioral Emergencies

1. Blood glucose
2. Calming techniques attempted
3. Nature of behavior which necessitates medication therapy: i.e., severe combativeness, risk of injury to self/others, inability to respond to calming strategies due to substance use (what?)
4. Response to treatment
5. Reassessment and ability to further evaluate patient for medical etiologies of combative behavior
6. Any patient statements regarding intent for harm to self or others (preferably in quotes)

M11. Respiratory Distress – Pediatric

1. History: immunization status, exposure to cigarette smoke or illness (daycare? RSV?)
    a. Asthma history
        i. Prior intubation, history of ICU stay
        ii. Last time on oral steroids
        iii. How frequently home meds / nebs being used
    b. Potential aspiration (foreign body)?
2. Room air oxygen saturation prior to treatment
3. Suspected trigger (infection, fever, allergen)
4. For symptoms developing over 24 hrs+: ability to take oral liquid/food and urine output, time of day/night that symptoms are worst
5. Severity of symptoms
    a. Mild/moderate
    b. Severe
        i. Significant retractions (where-suprasternal, intercostals, subcostal?)
        ii. Inspiratory stridor, stridor at rest
        iii. Shark fin on EtCO2
        iv. Altered mental status due to respiratory difficulty (head bobbing in infants)
        v. Increased RR with normal or elevated EtCO2
6. Associated symptoms: fever, nasal drainage, exposure to illness

M12. Respiratory Distress – Adult

1. History:
    a. Presence, duration and character of any chest pain or known anginal equivalent?
    b. Potential aspiration?
        i. If foreign body obstruction: Patient able to speak, move air? Inspiratory stridor? Cause?
    c. Time course of onset (over days, minutes?)
    d. Prior episodes:

i. COPD? Asthma? Last time on steroids? Frequency of use of home meds? Tobacco use? Home oxygen (what baseline amount), BiPAP (how often used)? Prior intubation?
ii. CHF? Medication or dietary noncompliance?
iii. Prior response to therapy?

e. Assessment of severity:
i. Severe: significant retractions, tripoding, # of words able to speak between breaths, sharkfin waveform capnograph
ii. Lung exam: wheezes, rales, ronchi
iii. JVD? Peripheral edema (difference from baseline)?
iv. Diaphoresis

2. Reassessments including respiratory rate and oxygen saturation trending
3. If inhalation injury: Type of gas, duration of exposure, area of exposure (enclosed room?), associated burns / singing (oral, nasal, facial area)

M13. Newborn Resuscitation

1. Note perinatal and mother's obstetric history (high risk? # weeks gestation?)
2. Initial and 5 minute APGAR
3. Response to progressive steps of neonatal resuscitation triangle
4. Circumstances of out of hospital birth

M14. Active Labor and Childbirth: Separate report required for mother and each neonate delivered

1. Obstetric SAMPLE history (from **PATIENT ASSESSMENT** Procedure)
2. Nondelivery:
   a. Estimated weeks gestation / due date, last menstrual period?
   b. Known intrauterine pregnancy?
   c. Gravida - Para - Abortus #
   d. Any complications of prior or current pregnancy
   e. High risk (why?)
   f. Multiple pregnancy?
   g. Abdominal pain (where)? Trauma?
   h. Sensation of fetal movement?
   i. S/S preeclampsia: peripheral edema, headache, visual disturbance, hyperreflexia?
3. Possible labor, add:
   a. Time of onset of labor,
   b. Frequency of contractions (duration & frequency and whether palpable)
   c. Vaginal discharge / bleeding?
   d. Rupture of membranes, discoloration of amniotic fluid?
   e. Vaginal exam: crowning?
4. Delivery, add:
   a. Presenting part
   b. Birth info:
      i. Time of birth
      ii. Male / female
      iii. Newborn Resuscitation info as above

PROCEDURES

Airway Management (P-10)

1. Any invasive airway placement should have the following elements documented:
    a. Indication for invasive airway placement (i.e. what caused continuous airway compromise, such as vomiting, inability to obtain proper mask seal with multiple attempts, etc). Refer to P-10 Escalating Airway Algorithm to assure you can document following that algorithm.
    b. Preoxygenation—how, or reason why not (i.e. BVM ventilation with high flow oxygen). Note if 15LPM nasal cannula placed as per algorithm for advanced airway attempt.
    c. Airway placement procedure:
        i. Combitube placement
            1. Any difficulty with placement
            2. Which tube ventilated to
            3. Immediate waveform capnography to confirm
                a. Adequate waveform
                b. Initial EtCO2
            4. Breath sounds, gastric sounds
        ii. Endotracheal intubation
            1. Blade used
            2. Visualization (Mallampati class)
            3. Time of tube placement
            4. Immediate waveform capnography to confirm
                a. Adequate waveform
                b. Initial EtCO2
            5. Breath sounds, gastric sounds
            6. Size tube
            7. Depth (at teeth or lips)
            8. How tube secured (i.e. tube holder)
        iii. If applicable, note that CPR was not interrupted
        iv. Any complications: vomitus, foreign body
        v. Rate of ventilation / targeted EtCO2
        vi. If an airway attempt (laryngoscope or combitube past the teeth) is unsuccessful, explain why, i.e. vomitus, tube too large, failure of suction, unable to visualize cords. If tube was placed and incorrect placement noted by EtCO2 or vomitus through tube, be sure to explain that as well. Note if any oxygen desaturation during airway placement attempt.
    d. Documentation of EtCO2 waveform with every patient movement (by hitting "print"), including at patient turnover. See **WAVEFORM CAPNOGRAPHY, P-7** for specific expectations regarding capnography documentation.

PEEP / CPAP (P-12, P-13)

1. Indication for PEEP/CPAP (i.e., ARDS, COPD, CHF, pulmonary contusion with rib fractures, hemothorax, chest tubes)
2. Airway type (BVM, endotracheal tube, tracheostomy)
3. Current hospital ventilator settings for patients being transferred:

   a. Current settings for ventilator / CPAP / BiPAP in hospital (or if BVM only) and any changes in last 12 hours: pressure or volume control, mode [Assist-Control, SIMV, pressure support, etc.], PEEP, tidal volume, rate, FiO2, any change in standard I:E ratio, peak inspiratory pressures.
4. If PEEP over 5 cm H2O is newly initiated: vital signs including lung exam, respiratory rate, oxygen saturation, blood pressure, pulse, EtCO2 and capnograph waveform.
5. Time PEEP/CPAP initiated
6. Patient response to PEEP/CPAP
   a. able to tolerate or not
   b. final PEEP setting
   c. airway objectives met (Oxygen sat? Decreased resp rate? Normalized EtCO2?)
   d. repeat vital signs
7. Monitor strip reflecting continuous cardiac monitoring, intermittent vital signs, continuous pulse oximetry and EtCO2 monitoring.

Chest Decompression (P-25)

1. Indication for decompression and why you suspected tension pneumothorax under criteria described in P-25.
   a. Cardiac arrest with mechanism for possible tension – describe mechanism, i.e. blunt chest trauma with SQ air.
   b. Patients with a pulse:
      i. Acute and progressive respiratory distress –describe specifics, i.e. worsening compliance with BVM ventilation, downward trend in oxygen saturations in spite of 100% oxygen, increased respiratory rate
      ii. AND appropriate mechanism such as history such as severe COPD
      iii. AND signs of shock including progressive tachycardia and/or adult SBP < 90
      iv. AND at least 3 of the following
         1. Unilateral decreased or absent breath sounds (which side?)
         2. Unilateral hyperresonance of chest on percussion
         3. Oxygen saturation < 90% in spite of maximum oxygen supplementation
         4. Jugular vein distension
         5. Subcutaneous emphysema
         6. Tracheal deviation (away from the affected side) – late sign
   c. Physician name if ordered by medical direction
2. Site prep used, specific location and type of needle inserted (i.e. ARS)
3. Result of needle insertion – bubbles in syringe? air rush? Improved BVM compliance? Improved SaO2? Breath sounds?
4. Placement of occlusive dressing
5. Reassessment of vital signs following insertion and prior to turnover at hospital in patient with a pulse. At a minimum for pulsatile patients, monitor strips should be included that show cardiac rhythm, oxygen saturation trend, blood pressure trend, and critical level monitoring (q 5 minute pertinent vital signs) and EtCO2 if available.

Transcutaneous Pacing (P-32)

1. Indication for pacing
2. Describe whether patient was stable or unstable and why
3. Consideration / administration of sedation /analgesia.

4. Pre- and post-procedure vital signs.
5. Rate / current at which mechanical capture was achieved.
6. Patient reassessment after mechanical capture achieved.
7. How patient tolerated procedure (and need for additional sedation / analgesia).

Advanced Vascular Access (i.e. intraosseous, EJ, central line access) (P-40, P-41)

1. Indication for procedure (i.e. cardiac arrest with poor access)
2. Insertion:
   - Needle size used (gauge IV, EZIO needle color / length)
   - Location (right / left; proximal humerus / proximal tibia)
   - Success or not (determined by ability to draw back and flush easily and no extravasation),
   - How access / site was secured / stabilized (i.e., EZ Stabilizer)
   - If central /potentially heparinized line, that 5-7 ml of fluid in line drawn off and discarded before flush
   - Type of flush used: saline (or lidocaine for EZIO only)
3. Patient response to insertion (tolerated well or pain response if any)
   - If pain, what was done to manage pain
4. Total amount of fluid infused
5. Time of turnover to receiving hospital staff and verification that no extravasation noted at that time and continued good flow

Refusal of Care / Transport (P-3)

1. Refusals are a high risk area for patients in EMS. Thorough evaluation and documentation of the interaction is essential.
2. To refuse, patients must be competent and have shown they have the capacity to understand risks and benefits of the intervention(s) they are refusing.
   a. Patient must have normal mental status
   b. Patient must have capacity for decision-making verified (and documented):
      i. Absence of clinical intoxication (alcohol, drugs):
         a. Normal speech (no slurring)
         b. Normal coordination (gait, fine motor function).
         c. No nystagmus.
         d. Normal ability to pay attention and respond appropriately to questions / requests.
      ii. Absence of injury that may affect decision-making (i.e. head injury)
      iii. Normal mini-mental status exam if there is concern regarding any of the above.
      iv. It is possible to have ingested substances and not be clinically intoxicated as noted above.
   c. Patient must be able to adequately repeat back <u>in their own words</u> and reflect understanding of the assessment, risks and benefits being communicated to them.
   d. Patients with altered mental status and impaired judgment or active suicidality should not be allowed to refuse treatment.
3. A patient must have an <u>appropriate patient assessment</u> documented, including vital signs or a reason why they could not be performed.
   a. History of circumstance of injury or illness
   b. Circumstance of 911 activation (patient or 3d party call?)

   c. Past history
   d. Any history to suggest self-injurious behavior or suicidality
4. Patients may choose to refuse individual interventions (i.e. IV, nitroglycerin), or choose to refuse all care and transport.
   a. Note what patient is refusing
   b. Note what patient reason is refusing, and ideally what you have done to attempt to address this concern.
5. The following elements of conversation (and your written documentation) regarding the treatment being offered should include:
   a. The specific medical condition(s) that is/are suspected that are of greatest concern if intervention is not provided
   b. What the realistic benefits are to the treatment being offered (i.e. pain management, monitoring for cardiac arrhythmia)
   c. What the realistically expected risk is to the patient if they do not have their medical condition promptly treated and further evaluated in the emergency department
   d. The specific need for specific interventions and/or transport for further evaluation and treatment. Include any time sensitivity to these recommendations (i.e. stroke treatment must be offered in a specific time window, lacerations should be repaired as soon as possible).
   e. Alternative options that may exist
6. Every effort should be made to communicate the importance of timely evaluation to the patient prior to allowing them to refuse.
   a. This may include contacting a Division Leader to try to impress upon the patient the importance of the treatment being offered
   b. The Medical Director may be contacted as well for
      i. All triage red refusals
      ii. Any refusal who is in police custody
      iii. Provider discretion for unusual situations where medical director consult is thought to be helpful / persuasive in reinforcing the issues already discussed by the EMS provider
7. Patient safety is paramount. Make every effort to assure the patient has a “safety net” if they change their mind and decide they want care. A patient who refuses EMS care should have the following items reviewed with them and noted in documentation
   a. Patient’s plan to seek care through some other avenue (i.e. through PCP).
   b. That patient has someone with them (who?) who can call EMS if patient status changes
   c. That patient was advised that if they decide they do want care from EMS at a later time, they may call 911 anytime and we will respond.
   d. If patient with certain complaints (i.e. syncope or seizure), patient should specifically be instructed that they may not drive or operate machinery until cleared by a physician because they are placing themselves and others at risk.
   e. If patient refuses to sign, witnesses (i.e. family member, PD badge number) to the conversation / interaction should be documented.
8. If a minor is refusing care, a parent on scene or reached by phone should have the assessment, provider impression, treatment being offered, and risks of refusal/benefits of that treatment explained to them. If parent reachable only by phone, document time, phone # they were reached at, name, and relationship to patient, as well as their plan to retrieve the patient.

PATIENT DECLINATION OF CARE P - 3

PROCEDURE Effective 1-1-2013

Rationale: Patients who decline care are a high risk area in EMS. Thorough patient evaluation and documentation of the interaction is essential. Every patient should be provided an unconditional offer of transport. Providers should not initiate declination of care or suggest that the patient does not require treatment or transport. If a competent patient chooses to decline either transport or specific interventions, they should be provided information on their specific risks if these are known so they use this information in their decision-making.

Indications: See **DEFINITION OF A PATIENT (R-1)** for who is considered a patient. An individual who meets the definition as a patient will have the declination of care documented as noted in **PATIENT CARE DOCUMENTATION (P-2)** and additional information below.

Procedure:

1. As noted in **DEFINITION OF A PATIENT (R-1)**, every patient will be assessed by an EMS provider (from first response or transport agency) and assigned a triage level so an appropriate recommendation on treatment can be made to the patient.
    a. Triage green patient declinations may be obtained by an EMT level provider. The EMT has the discretion of requesting a Paramedic level evaluation if that is felt necessary, but if so, that patient would correctly be triaged as yellow.
    b. Triage yellow patient declinations must be assessed by a Paramedic level provider.
    c. Triage red patient declinations require a Medical Director Consult.
2. **All patients will receive an unconditional offer of transport to a hospital capable of meeting their medical needs, in keeping with A5 – Hospital Destination.**
3. If the patient chooses to decline care against medical advice, the provider should give the patient appropriate information on specific treatments being offered, benefits of that treatment, and specific risks of declining treatment and transport.
4. A patient must have an appropriate patient assessment documented, to allow the provider to appropriately inform the patient. This includes full vital signs or a reason why they could not be performed, as well as the following items.
    a. History of circumstance of injury or illness
    b. Circumstance of 911 activation (patient or 3d party call?)
    c. Past medical history
    d. Any history to suggest self-injurious behavior or suicidality
5. Patients may choose to decline individual interventions (i.e. IV, nitroglycerin), or choose to decline all care and transport.
    a. Note specifically what intervention patient is declining
    b. Note reason why patient is declining, and what you have done to attempt to address this concern.
6. To decline, patients must be competent and have shown they have the capacity to understand risks and benefits of the intervention(s) they are declining. To do so, patient must meet all of the following components.
    a. Patient must have normal mental status
    b. Patient must have capacity for decision-making verified (and documented) as follows:
        i. Absence of clinical intoxication (alcohol, drugs):
            1. Normal speech (no slurring)

2. Normal coordination (gait, fine motor function).
3. No nystagmus.
4. Normal ability to pay attention and respond appropriately to questions / requests.
5. It is possible to have ingested substances and not be clinically intoxicated if the criteria noted above are met.

ii. Absence of injury that may affect decision-making (i.e. significant head injury).

c. Normal mini-mental status exam (at least 21 points) if there is concern regarding any of the above (See **PATIENT CARE DOCUMENTATION, P-2** and **MINI MENTAL STATUS EXAM, R-12**).Patient must be able to adequately repeat back in their own words and reflect understanding of the assessment, risks and benefits being communicated to them.

d. Patient must not have suicidal or homicidal ideation expressed.

7. **IF** a patient is deemed competent and wishes to decline against medical advice, the following elements of conversation (and your written documentation) regarding the treatment being offered should include:
   a. The specific medical condition(s) that is/are suspected that are of greatest concern if intervention is not provided
   b. What the realistic benefits are to the treatment being offered (i.e. pain management, monitoring for cardiac arrhythmia)
   c. What the realistically expected risk is to the patient if they do not have their medical condition promptly treated and further evaluated in the emergency department
   d. The specific need for specific interventions and/or transport for further evaluation and treatment. Include any time sensitivity to these recommendations (i.e. stroke treatment must be offered in a specific time window, lacerations should be repaired as soon as possible).
   e. Alternative options that may exist
8. Every effort should be made to communicate the importance of timely evaluation to the patient (and family if present or patient consents to their notification) prior to allowing them to decline.
9. Patient safety is paramount. Make every effort to assure the patient has a "safety net" if they change their mind and decide they want care. A patient who declines EMS care should have the following items reviewed with them and noted in documentation
   a. Patient's plan to seek care through some other avenue (i.e. through PCP).
   b. That patient has someone with them (who?) who can call EMS if patient status changes
   c. That patient was advised that if they decide they do want care from EMS at a later time, they may call 911 anytime and we will respond.
   d. Patients with certain complaints (i.e. syncope or seizure) should specifically be instructed that they may not drive or operate machinery until cleared by a physician because they are placing themselves and others at risk.
   e. If patient declines to sign, witnesses (i.e. family member, PD badge number) to the conversation / interaction should be documented.

Considerations

- If there is a conflict between this procedure and **PATIENT CARE DOCUMENTATION (P-2)**, this procedure supercedes.
- Patients with altered mental status and impaired judgment or active suicidality should not be allowed to decline treatment because they are a danger to themselves or others. Law enforcement should be involved with these patients.
- Patients who have been syncopal, seized, or are considered by the provider or on line medical command to be a risk to themselves or others should not be allowed to drive or operate machinery and ideally should be left in the care of someone who can summon help if needed.
- If a minor is declining care, a parent on scene or reached by phone should have the assessment, provider impression, treatment being offered, and risks of declination/benefits of that treatment explained to them. If parent reachable only by phone, document time, phone # they were reached at, name, and relationship to patient, as well as their plan to retrieve the patient.

Documentation:

1. Patient competence must be documented specifically including:
    a. Normal mental status
    b. Capacity for decision-making verified by:
        i. Absence of clinical intoxication (alcohol, drugs):
            1. Normal speech (no slurring)
            2. Normal coordination (gait, fine motor function).
            3. No nystagmus (no rapid lateral eye movements).
            4. Normal ability to pay attention and respond appropriately to questions / requests.
        ii. Absence of injury that may affect decision-making (i.e. head injury).
        iii. Normal mini-mental status exam if there is concern regarding any of the above (provide score).
    c. Ability to adequately repeat back in their own words and reflect understanding of the assessment, risks and benefits being communicated to them.
2. If a guardian / parent / DPOA is declining care on behalf of the patient, document their full name, relationship, and specifically what was discussed with them (patient assessment, risks, benefits, alternatives).
    a. If this person is reachable only by phone: document time, phone # they were reached at, name, and relationship to patient, as well as their plan to retrieve the patient or assure their ongoing monitoring.
3. If patient declines to sign AMA, specific documentation of why and a non-EMS witness (whose name is documented) should be included.
4. For patients with suspected cardiac chest pain or anginal equivalent, **TIMI Risk Scoring (R – 18)** should be used and score documented in the patient care record, and patient be given specific information on whether they are low, intermediate, or high risk and what that means as far as having a cardiac event in the next 2 weeks.
    a. Statements to a patient with TIMI low risk could be something like:
        i. Based on our assessment today and known statistics on patients in your situation, you have a risk score of 1, which puts you in a **low risk** category.

ii. **Low risk is not the same as no risk**. What low risk means is that you have about a 1 in 20 chance (or 5%) of having a heart attack or needing a blocked heart vessel emergently opened within the next 2 weeks.
iii. We have a **limited ability to evaluate** whether you are having a heart attack with the equipment we have available to us. You should be evaluated in a hospital where blood work can be done to evaluate whether there is damage to your heart that we cannot see on our monitor. It is possible to have a heart attack without there being any changes noted on our ECG tracing.
iv. Having a heart attack is **time sensitive**—the longer the heart vessel is completely blocked, the more damage there is to your heart. So it is important for you to be evaluated as soon as possible.
v. If you are having a heart attack, it also puts you at risk of having a deadly heart rhythm and having your heart stop beating.
vi. Because of all these very serious risks and time critical complications, we strongly encourage you to go with us by ambulance to the hospital now.

b. Statements to patient with *anything but* TIMI low risk could be something like:
i. Based on our assessment today and known statistics on patients in your situation, you have a risk score of 4, which puts you in an intermediate to high **risk category**.
ii. What that means is that you have about a **1 in 5 chance (or 20%) of having a heart attack or needing a blocked heart vessel emergently opened within the next 2 weeks**.
iii. We have a **limited ability to evaluate** whether you are having a heart attack with the equipment we have available to us. You should be evaluated in a hospital where blood work can be done to evaluate whether there is damage to your heart that we cannot see on our monitor. It is possible to have a heart attack without there being any changes noted on our ECG tracing.
iv. Having a heart attack is **time sensitive**—the longer the heart vessel is completely blocked, the more damage there is to your heart. So it is important for you to be evaluated as soon as possible.
v. If you are having a heart attack also puts you at **risk of having a deadly heart rhythm** and having your heart stop beating.
vi. Because of all these very serious risks and time critical complications, we **strongly encourage you to go with us by ambulance** to the hospital now.
vii. The **benefit** of going by ambulance is that we have defibrillators that we will have immediately available to shock your heart out of a deadly rhythm, as well as medications to try to restart your heart if it stops. We can also be in direct communication with the hospital to have them be ready to immediately begin evaluating you for your heart problem when you arrive.
viii. The **risk** of not going by ambulance is that your heart stops beating while you are being driven to the hospital and there is no one

immediately there who can provide the treatments you need that I just described to you. We will still respond if you call 911 when that happens, but precious minutes will be lost. The other risk is that your evaluation at the hospital will not begin as quickly if you do not come by ambulance.

5. For patients with syncope, **Syncope Risk Score (R – 19)** should be used and score documented in the patient care record, and patient be given specific information on whether they are high risk and what that means as far as having one of the specified outcomes in the next 7 days. Statements to a patient with high risk could be something like:
    a. Based on our assessment today and known statistics on patients in your situation, you have a risk score which puts you in a **high risk** category.
    b. What that means is that you have a **high likelihood of having a serious complication within the next 7 days.** These include things like death, myocardial infarction, arrhythmia, pulmonary embolism, stroke, or other acute problems like internal bleeding or significant infection that require hospital admission.
    c. We have a **limited ability to evaluate** you with the equipment we have available to us, and we cannot assure you that you will not have one of these serious complications. You should be evaluated in a hospital today because of the significant risk of serious complications.
    d. Because of all these very serious risks and time critical complications, we **strongly encourage you to go with us by ambulance** to the hospital now.
    e. The **benefit** of going by ambulance is that we have defibrillators that we will have immediately available to shock your heart out of a deadly rhythm, as well as medications to try to restart your heart if it stops or improve your blood pressure. We can also be in direct communication with the hospital to have them be ready to immediately begin evaluating you for your problem when you arrive.
    f. The **risk** of not going by ambulance is if you have one of these serious, time-critical medical problems, precious minutes will be lost if you do not allow transport now. We will still respond if you call 911 when that happens, but precious minutes will be lost, and your outcome may be worse than if you go now, including death.
6. Patients with hypoglycemia wishing to decline care after their hypoglycemia has been corrected, require a Medical Director Consult if they do not meet all of the conditions below. Providers <u>should not</u> suggest to hypoglycemic patients that have regained normal mental status and blood glucose that they do not require transport. Hypoglycemia in a patient whose insulin dose has not changed may be an early (or the only) sign of many concerning problems, including infection, myocardial infarction. These require transport and further evaluation. If ALL six of the following elements are met, and the Division Leader is in agreement, a patient declination may be taken. If any of the following elements are not met, a Medical Director Consult is required.
    1. That the patient is insulin-dependent only and NOT taking any oral hypoglycemic agent.

   a. Oral hypoglycemics are long-acting agents (24-36+ hours), and hypoglycemia on these agents is highly likely to recur and demands transport to the hospital.
   b. Some insulins (Lantus, Humalog) are long acting as well.
2. That the patient has eaten carbohydrates and is tolerating po normally. This means no recent history of vomiting or diarrhea that may have led to the hypoglycemia, or other causes of feeling poorly and not eating normally (fever, etc).
3. That there is someone with the patient who can continue to monitor the patient's mental status.
   a. We recommend that patient's blood glucose should be monitored hourly by family for 2 hours if patient is hypoglycemic on regular insulin only.
   b. If on long-acting insulin, this should be done for at least 6 hours, along with ongoing regular food intake.
4. A repeat blood glucose is documented that is at least 100 for patients who required IV dextrose, and at least 70 for patients treated only with oral agents or food.
5. The patient must have returned to baseline mental status and be competent to decline care.
6. There is a plausible reason for the hypoglycemia that does not require further medical evaluation, which is documented in the record. These are mostly limited to patient taking insulin and not eating soon enough.

7. Summary:
   a. Medical Director Consult REQUIRED for:
      i. All Triage Red declinations.
      ii. Hypoglycemic declination that does not meet all 6 criteria.
   b. Medical Director Consult OPTIONAL at provider discretion for:
      i. Any situation where medical director consult is thought to be helpful / persuasive in reinforcing the issues already discussed by the EMS provider. Medical Director Consult should be called by the Division Leader after they have been involved in the case and been unsuccessful in persuading the patient of the need for transport. This includes declinations in police custody at Division Leader discretion.
   c. Division Leader REQUIRED for:
      i. An incompetent patient.
      ii. A patient who has had suicidal or homicidal ideation.
      iii. Any declination in police custody.
      iv. A hypoglycemic patient declination who meets all 6 criteria.

GLUCOSE ASSESSMENT P - 4

PROCEDURE Effective 7-1-2012

Rationale: To provide indications for glucose assessment.

Indications: Glucose assessment is indicated in patients with altered mental status, combativeness, or stroke-like symptoms where hypoglycemia must be ruled out as a reversible cause as soon as possible.

Contraindications/ Precautions:

None

Necessary Equipment

Blood glucose monitor, maintained as per manufacturer with quality controls.
Blood glucose strips
Patient blood sample

Necessary Monitoring

None

Procedure:

- Use blood obtained from patient
  - Fingerstick may be used. In infants, heelstick may be used.
  - Blood from an IV that has been initiated may be used to spare the patient an additional stick.
- Apply to strip and into monitor according to manufacturer instructions.
- Document result in patient care record

Considerations

Glucose assessment is not useful or required for every patient encounter.
Glucose assessment is not useful or required for every diabetic patient.
Patients with glucose reading of "high" may have signs and symptoms of inadequate perfusion. This is not always the case. In patients with signs of inadequate perfusion, consider **FLUID RESUSCITATION Procedure (P – 42)**.

Rationale: To provide guidance on when 12-lead ECG should be obtained as part of the patient assessment.

Indications:
12-lead ECG should be obtained for:

1. Patients with suspected ischemic chest pain. This includes patients with suspected anginal equivalent such as shortness of breath or jaw pain. 12-lead ECG should be obtained as soon as possible, and is considered one of the basic vital signs in a patient with suspected ischemic chest pain. Ideally, 12-lead ECG should be obtained prior to intervention, but treatment should not be delayed to perform 12-lead ECG.
2. Patients with suspected cardiac dysrhythmia (exclusive of sinus tachycardia)
3. Patients age 40 or over with syncope or dizziness. Consider 12-lead ECG in patients with syncope or dizziness < 40 years old at provider discretion.

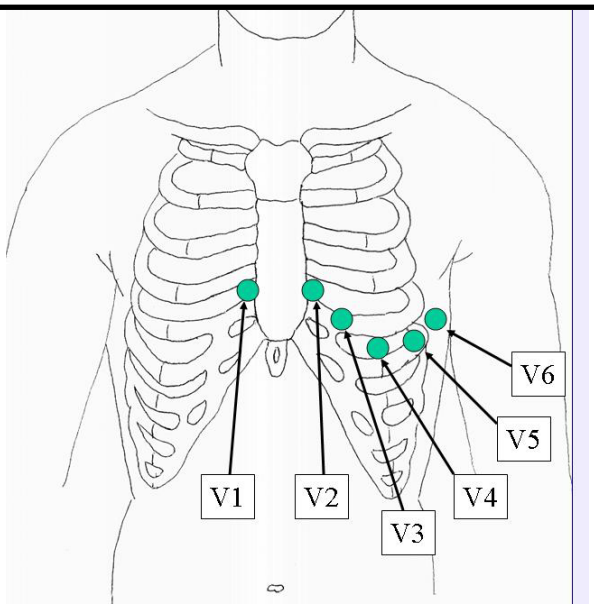
12-lead ECG may be performed at provider discretion if felt appropriate based on patient assessment. Reason should be documented in patient care record.

Contraindications/ Precautions:
None

Necessary Equipment
12-lead ECG monitor
ECG electrodes

Procedure:
Place ECG electrodes in appropriate placement. Standard 12-lead should be the first view performed in every patient.
Standard 12 lead ECG lead placement:

- V1: right 4th intercostal space
- V2: left 4th intercostal space
- V3: halfway between V2 and V4
- V4: left 5th intercostal space, midclavicular line
- V5: horizontal to V4, anterior axillary line
- V6: horizontal to V5, mid-axillary line



Right sided ECG may be useful for detection of right ventricular infarct associated with inferior wall MI. At provider discretion, may consider right sided ECG, in patients with ST elevation in II, III, aVF.
Right leads mirror the standard leads, extending around the right side of the chest.

Posterior ECG may be useful for detection of posterior infarct associated with inferior or lateral wall MI. At provider discretion, may consider posterior ECG, particularly in patients with ST depression in V1-3 or deep T wave inversion in V1-2. Posterior leads are:

- V7: posterior axillary line horizontal to V6
- V8: midscapular
- V9: paraspinal

Considerations

- Copy of 12-lead ECG should stay with patient for turnover to emergency department staff. Copy should also be retained with patient care record.
- Provider interpretation of 12-lead ECG should be documented in patient care record.
- If non-standard ECG lead placement is performed, it should be clearly documented in the patient care record at which time each non-standard ECG was done so it can be properly interpreted, as there is no way to adjust the standard 12-lead designation that prints.
- 12-lead ECG should be repeated with significant change in patient status. This may include either worsening or resolution of suspected ischemic chest pain, resolution of dysrhythmia, or change in suspected anginal equivalent symptoms.

Rationale: To provide guidance on appropriate use of waveform capnography for evaluating and monitoring critically ill patients.

Indications:

Capnography is indicated for:

- assessment and monitoring of patients' ventilatory status in patients with significant respiratory distress, with or without airway adjuncts
- assisting in decision-making for patients with respiratory difficulty of unclear cause (i.e. bronchospasm vs. pulmonary edema) to help direct therapy
- evaluating acid-base status in critically ill patients

Waveform capnography is not indicated for every patient with shortness of breath. Rather, it is a monitoring tool for critical patients where interpretation of the capnography waveform and EtCO2 values assists providers in decisionmaking to determine the appropriate course of treatment for the patient.

Appropriate applications / indications for waveform capnography include:

In patients with invasive airways, waveform capnography is **REQUIRED**:

- for verification of correct airway placement and continuous evidence of correct tube placement
  - **lack of immediate and ongoing monitoring / verification of correct airway position using waveform capnography constitutes an unjustifiable risk of harm to the patient.**
- to direct appropriate ventilatory rate
  - to maintain EtCO2 35-45 in normal patients
  - to appropriately but not excessively hyperventilate patients with signs of herniation only to maintain EtCO2 30-35 (no lower than 30)

In patients in cardiac arrest, waveform capnography is **REQUIRED**:

- to monitor quality of CPR
- as an early indicator of ROSC (rapid increase of 10-15 in EtCO2)
- evaluation of prognosis for survival

In spontaneously breathing patients, waveform capnography is **REQUIRED**:

- for patients on CPAP, or in severe respiratory distress (receiving epinephrine, magnesium therapy) to assess adequacy of ventilation and change in ventilatory status in response to treatment

In spontaneously breathing patients, waveform capnography is an option:

- for assessment of critically ill patients, for example:
  - hypotension due to sepsis or unclear cause (metabolic acidosis with / without compensatory respiratory alkalosis)
  - status epilepticus to evaluate ventilatory and acid/base status
  - evaluation for acidosis in patients with altered mental status and potential diabetic ketoacidosis (metabolic acidosis)
- assessment of adequacy of ventilation and change in ventilatory status in response to treatment
- differentiating between severe bronchospasm (sharkfin waveform) and other causes of respiratory distress (normal waveform, pulmonary edema)

Necessary Equipment

Capnography-capable monitor
Noninvasive (nasal prong) EtCO2 detector
Inline EtCO2 detector for use with invasive airways (ETT, CBT, King) or BVM

Necessary Monitoring

Critical patients who require waveform capnography should at a minimum be on continuous pulse oximetry monitoring and continuous cardiac monitoring is strongly recommended.

Continuous waveform capnograph monitoring **is required** for:

- Any invasive airway (CBT, King, ETT): from the time of initial placement (within 1 minute) until turnover to ED staff or cease resuscitation
- Cardiac arrest
- Patients in severe respiratory distress (including patients requiring CPAP, magnesium, epinephrine)

Procedure:

Invasive airway / BVM

- Attach inline detector to monitor and allow it to initialize / calibrate.
- Place detector on invasive airway immediately upon placement or inline with BVM
- Assess capnograph waveform and EtCO2 to assure correct airway placement
- "Print" initial waveform that confirms proper placement or establishes baseline waveform and EtCO2
- Interpret meaning of capnography waveform and EtCO2 value in the context of patient presentation and make appropriate treatment decisions. See "Interpretation" below for some guidance.
- Review and "Print" waveform with each patient movement to verify continued correct airway placement

Noninvasive

- Attach detector to monitor and allow it to initialize / calibrate.
- Attach nasal prong detector to patient
- Assess initial capnograph waveform and EtCO2 to establish baseline EtCO2 and any evidence of abnormal ventilatory patterns
- "Print" initial waveform that establishes baseline waveform and EtCO2
- Interpret meaning of capnography waveform and EtCO2 value in the context of patient presentation and make appropriate treatment decisions. See "Interpretation" below for some guidance.
- Review and "Print" waveform with change in patient condition or with treatment to demonstrate response to treatment

Waveform capnograph must be recorded (by hitting "Print") at the following times at a minimum:

- to confirm initial airway placement (within 1 minute),
- with EVERY patient movement (i.e., placement into ambulance, taken out of ambulance, transfer to ED bed).
- with EVERY significant change in patient condition (i.e. ROSC).

Failure to capture waveforms and demonstrate continuous monitoring of invasive airways as described will be considered risking unjustifiable harm to the patient.

Documentation (see also PATIENT CARE DOCUMENTATION, P – 2):

- Any invasive airway placement should have the following elements documented:
  - Indication for invasive airway placement (i.e. vomitus, apnea)

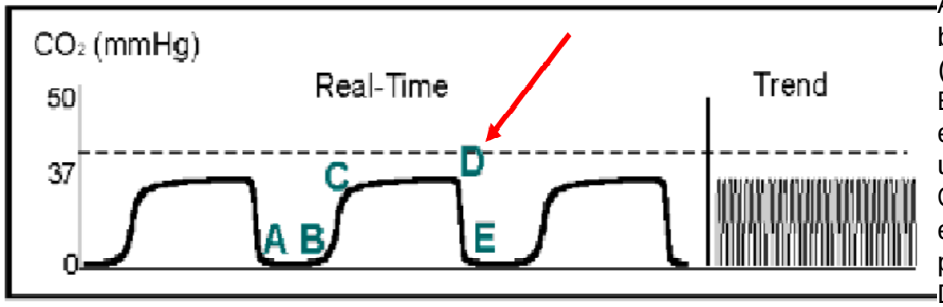
- Preoxygenation—how, or reason why not (i.e. BVM ventilation with high flow oxygen)
- Airway placement procedure description (type of tube, blade used, depth of tube @ teeth or lips, how secured, time placed) and any difficulty with placement
- Immediate waveform capnography to confirm proper tube placement:
  - Interpretation of initial waveform shape
  - Initial EtCO2 value
  - Breath sounds, gastric sounds
- If applicable, note that CPR was not interrupted
- Any complications: vomitus, foreign body
- Rate of ventilation / targeted EtCO2
- Documentation of EtCO2 waveform with every patient movement (by hitting "print"), including at patient turnover. Interpretation of EtCO2 trend and waveform in narrative documentation and any treatment decisions made on this basis (i.e. increased ventilatory rate)

- Spontaneously breathing patients should have the following elements documented:
  - Indication for waveform capnography (see Indications section)
  - Interpretation of initial waveform shape and EtCO2 value
  - Assessment / treatment plan
  - Reassessment to show response to treatment, including vital sign monitoring and trending in EtCO2 values and/or waveform shape

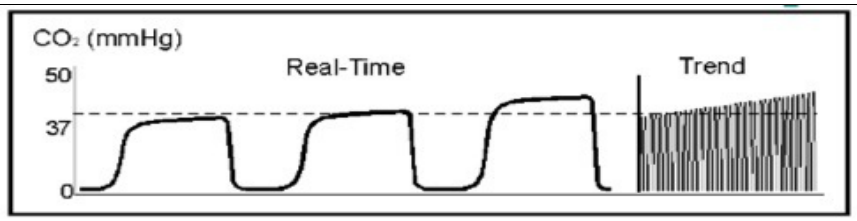
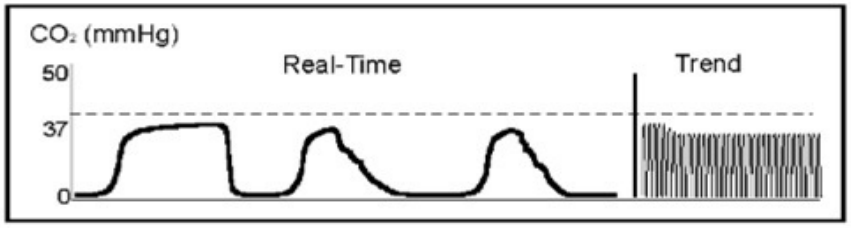
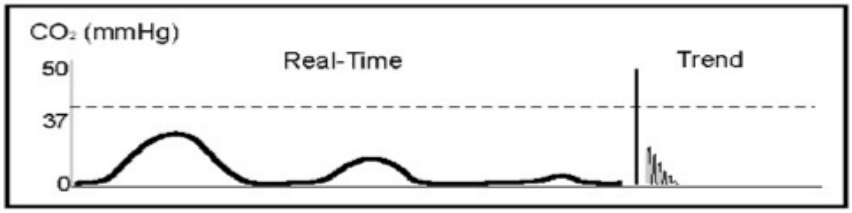
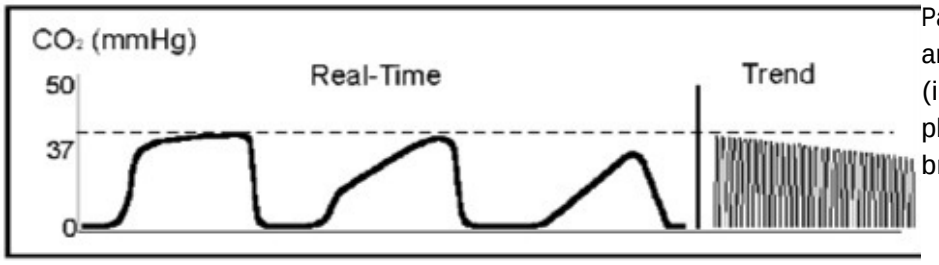
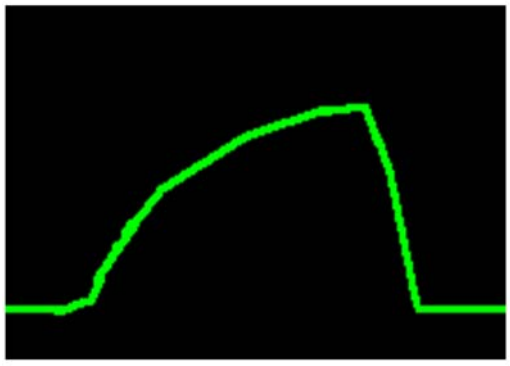
Considerations:

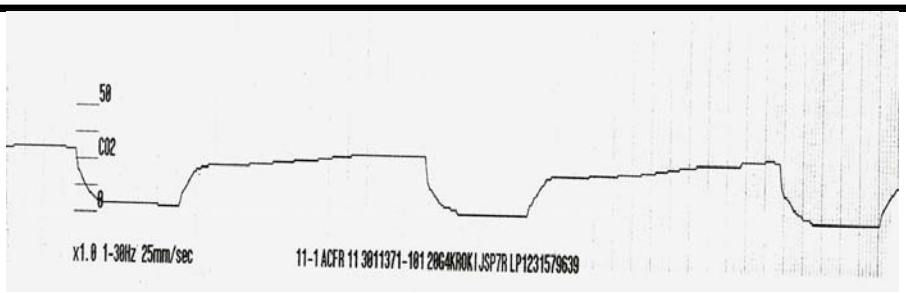
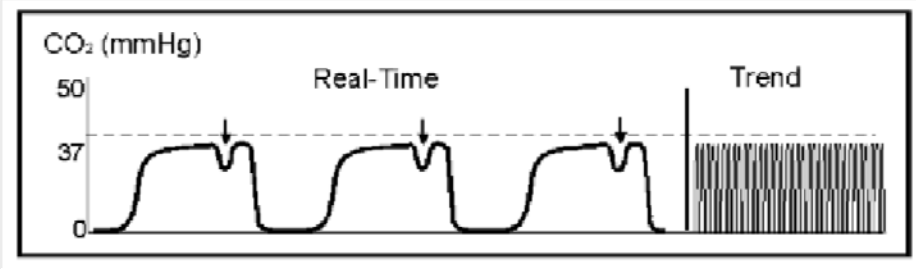
Misplaced invasive airways are an immediate life threat to the patient and can be immediately and definitively demonstrated in the perfusing patient using waveform capnography. Waveform capnography has 100% accuracy in demonstrating correct invasive airway placement in the perfusing patient, and 62-100% in the patient in arrest. Continuous waveform capnography has 100% accuracy in identifying unrecognized misplaced intubation (UMI), while in patients without continuous capnography, there were 23% UMI.

Both hyper- and hypo- ventilation negatively impact patient outcomes for numerous reasons and can be avoided by use of continuous waveform capnography to direct ventilatory rate.

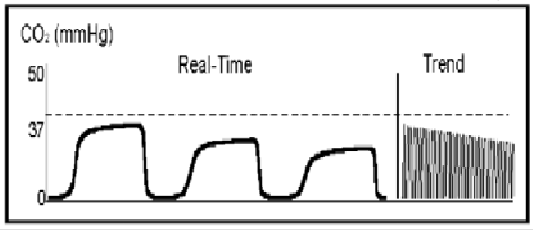
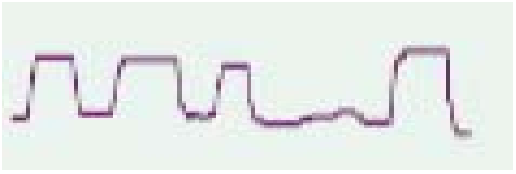
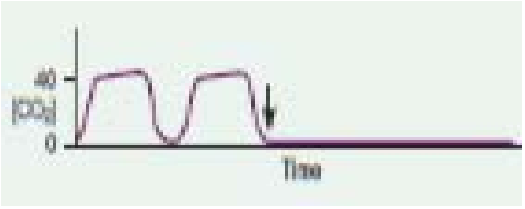
Normal waveform		A-B = baseline (inspiratory) B-C = expiratory upstroke C-D = expiratory plateau D = EtCO2 value D-E inspiration begins

Interpretation:

	WAVEFORM	CAUSE
Normal waveform, increasing EtCO2		Decreased resp rate, tidal volume, increased metabolic rate
Abnormal waveform: normal begin of exhalation, abnormal end		Leaky cuff, airway too small for patient
Abnormal waveform no a-b-c-d points or clear phases		Esophageal tube placement
Abnormal waveform: abnormal begin of exhalation with greater slope, normal inhalation Shark fin		Partly occluded artificial airway (i.e. mucus plug, kinked), bronchospasm
Abnormal waveform: Shark fin		Severe bronchospasm

Abnormal waveform: Shark fin		Significantly prolonged expiratory phase due to bronchospasm / COPD Normal adult inspiratory to expiratory ratio is 1:2, this is at least 1:4
Abnormal waveform "Curare Cleft"		Paralytic wearing off, patient beginning to initiate spontaneous breaths

From: Krauss B, Mason PE. 2009. Devices for Assessing Oxygenation and Ventilation. In Roberts JR and Hedges JR, Clinical Procedures in Emergency Medicine, Saunders.

Diagnosis	Waveform	Features		Intervention
Normal waveform Hyper-ventilation		SpO2 EtCO2 Waveform RR	Normal Decreased Decreased amplitude and width Increased	Decrease ventilatory / respiratory rate
Normal waveform Physiologic variability		SpO2 EtCO2 Waveform RR	Normal Normal Normal Normal	
Loss of waveform Apnea, Complete airway obstruction or laryngospasm		SpO2 EtCO2 Waveform RR	Normal or decreasing ZERO Absent ZERO	Reassess patient, BVM ventilation, open airway if no airway adjunct, suction airway if ETT or CBT

Rationale: To provide guidance on interpretation of carbon monoxide detector readings obtained from the RAD-57 device and correlate these readings with specific patient care considerations. Carbon monoxide (CO) is the "silent killer".

Indications: First response agencies in EMSS carry RAD-57 detectors which provide both pulse oximetry readings as well as carbon monoxide readings. Particularly in winter months and enclosed spaces, patients may be exposed to significant carbon monoxide levels and have only nonspecific symptoms such as headache or nausea. As a result, RAD-57 screening is a useful tool to alert healthcare providers that CO exposure or poisoning should be considered, and that the patient's environment should be reassessed before they return to a potentially toxic environment.

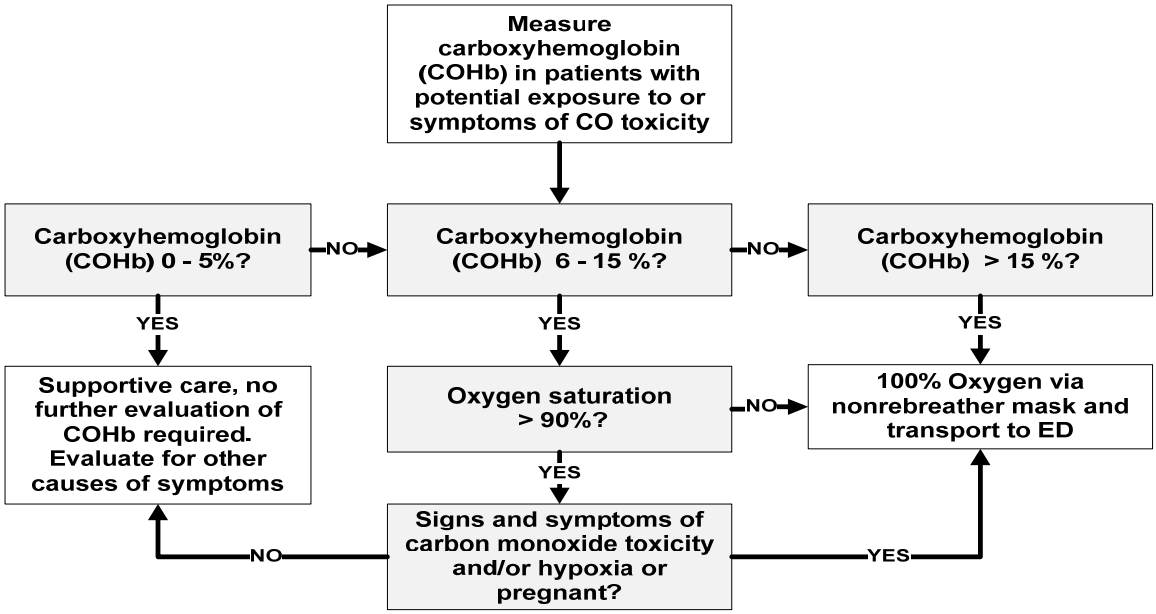
Specific indications may include:

1. Patients in enclosed environments that are at risk of elevated CO (i.e. unvented heating, fire or rehab scene) should be screened even if no severe symptoms.
2. Patients who may have symptoms of CO poisoning in the appropriate environment should be screened. Signs and symptoms of CO poisoning include:
    a. Altered mental status, dizziness
    b. Headache, Nausea/vomiting
    c. Chest pain, respiratory distress
    d. Neurological impairments
    e. Vision problems, reddened eyes
    f. Tachycardia, tachypnea
    g. Arrhythmias, seizures, coma

Necessary Equipment

RAD-57 device (available on fire department units)

Procedure:



Considerations

- Smokers may have baseline carboxyhemoglobin up to 10 if heavy smoker. Values 10 and greater are always abnormal and deserve further evaluation.
- Elevated carboxyhemoglobin in a pregnant patient reflects only the mother's level. Fetal hemoglobin has a greater affinity for carbon monoxide than adult hemoglobin, so the fetus is at greater risk of hypoxia and carbon monoxide toxicity even when maternal carboxyhemoglobin is not significantly elevated. As a result, pregnant women with potential exposure should be managed with oxygen therapy and transport even with carboxyhemoglobin levels that would otherwise not demand treatment.
- In patients with severely altered mental status and COHb<19, consider also cyanide toxicity and hydroxocobalamin administration.
- The low or absent carboxyhemoglobin (COHb) levels
- Specific protocols should be used to meet specific patient needs based on assessment findings. These may include:
    - **ALTERED MENTAL STATUS Protocol (M – 1)**
    - **POISONING / TOXIC EXPOSURE Protocol (M – 6)**
    - **CARDIAC ARREST: PEDIATRIC Protocol (MC – 4)**
    - **CARDIAC ARREST: ADULT Protocol (MC – 5)**
    - **NAUSEA / VOMITING Protocol (M – 9)**
    - **RESPIRATORY DISTRESS: PEDIATRIC Protocol (M – 11)**
    - **RESPIRATORY DISTRESS: ADULT Protocol (M – 12)**

AIRWAY MANAGEMENT P-10

PROCEDURE Effective 5-1-2013

Escalating Airway Algorithm - Cardiac Arrest (v. 2013.1)

Implement interventions in an escalating fashion, stopping at the point that the Airway Objectives have been met. Function only within your EMS System defined scope of practice. **Algorithm steps are each to be considered/performed IN SEQUENCE**.

Objective and Guiding Principles

Airway Objectives:

1) Maintenance of a patent airway.
2) Proper ventilation of alveoli with high flow oxygen.
3) No ventilation-related reduction of venous return/pre-load

Best Practice:

- Use the least amount of intervention necessary to accomplish airway objectives, given the patient's needs.
- Compressions will NOT be interrupted for any airway placement.
- $EtCO_2$ is to be continuously monitored from the onset of manual ventilations (both with and without an advanced airway in place). $EtCO_2$ is to be placed PRIOR to the first breath delivered through an advanced airway.

	Interventions	Keys to Application of Interventions
1	Open airway i. Head-tilt/Chin-lift, or ii. Modified Jaw Thrust iii. Suction as needed	
2	Chest Decompression i. If indicated, follow protocol (T-1, MC-4, or MC-5)	▪ Clinical setting: Patient with risk for closed pneumothorax AND findings of tension pneumothorax ▪ Findings may include: progressive decrease in lung compliance with BVM ventilation, signs of progressive cardiovascular compromise, JVD, absent or decreased breath sounds on affected side, hyperresonance to percussion on affected side, tracheal deviation (late sign).
3	Positive Pressure Ventilation i. BVM with OP/NP ii. Ventilate every 20 compressions with each breath lasting 2 seconds and with continuous chest compressions iii. Two-handed seal with one-handed squeeze of bag is preferred iv. Continuous $EtCO_2$ waveform monitoring	▪ Bag-Valve-Mask use is a TWO PERSON procedure. ▪ If BVM ventilations are effective and the patient's airway is clear, do not continue to advanced airway without a clear indication of need. ▪ $EtCO_2$ is to be monitored any time that manual ventilation is being performed. This includes BVM with mask.
	DO NOT use ETT with pediatric patients **(≤8yo)**	
4	Supraglottic Airway or Endotracheal Intubation i. If airway compromised with vomitus that cannot be cleared (continuous) - *or* - If resuscitation has gone past 660 compression mark and no V-Fib is present ii. Intubation will be performed by the PM2 who is MOST experienced in successful intubation. iii. Apply Oxygen via NC at 15 lpm prior to and throughout the intubation iv. $EtCO_2$ is to be placed PRIOR to the first breath delivered through the advanced airway. v. If ETT attempted, 2 attempts maximum per patient, total. If unsuccessful, move to different airway plan. vi. If successfully placed endotracheal tube is dislodged (extubated), replace with supraglottic airway	▪ A "continually compromised airway" is one in which the free flow of air cannot be maintained with basic airway positioning and use of suction. ▪ Compressions are NEVER interrupted for advanced airway placement. ▪ A supraglottic airway (Combitube® or King LTD®) is as effective as an endotracheal tube and should not be replaced in the field with an ETT. ▪ Endotracheal intubation is NOT a student paramedic function.

Difficulty Breathing – Medical Patient (v. 2013.1)

Implement interventions in an escalating fashion, stopping at the point that the Airway Objectives have been met. Function only within your EMS System defined scope of practice. **Algorithm steps are each to be considered/performed IN SEQUENCE.**

Objectives and Guiding Principles

Airway Objectives:

1. Maintenance of a patent airway.
2. Proper ventilation of alveoli utilizing appropriate oxygen flow.
3. Maintain $EtCO_2$ between 35% to 45%.
4. Maintain $SaO_2 \geq 94\%$ (Permissive hypoxia in severe COPD patients on supplemental oxygen: target $SaO_2 \geq 90\%$)

Best Practice:

- Use the least amount of intervention necessary to accomplish airway objectives, given the patient's needs.
- $EtCO_2$ should be used with all critical patients and when necessary for clinical diagnosis.
- $EtCO_2$ must be continuously monitored from the onset of manual ventilations (both with and without an advanced airway in place). $EtCO_2$ is to be placed PRIOR to the first breath delivered through an advanced airway.
- SaO_2 values lag behind actual hypoxia. The $EtCO_2$ is a more reliable and real-time indicator of patient ventilatory status.

	Interventions	Keys to Application of Interventions
1	Open Airway if needed and accommodate position of patient preference for ease of breathing whenever possible	
2	Oxygen Administration i. Maintain SaO_2 at $\geq$ 94% ii. Use $EtCO_2$ if patient is critical or if needed to distinguish between bronchospasm and CHF/Pulmonary Edema iii. Humidify oxygen if suspected croup	▪ SaO_2 values trend behind actual PaO_2. Use SaO_2 for trending. Use $EtCO_2$ in critical situations. ▪ Patients in end-stage COPD with continuous oxygen may need to be allowed to have permissive hypercapnea. ▪ $EtCO_2$ nasal cannula devices are used to provide real time data in a critical patient OR to make a differential diagnosis.
3	Medication Administration (Follow protocol) CPAP (Non-asthmatic patients only, per protocol)	▪ If $EtCO_2$ waveform is prolonged, use CPAP. If shark fin is present, withhold CPAP. ▪ Meds and CPAP can be administered concurrently.
4	Positive Pressure Ventilation i. Use OP/NP, if tolerated ii. Ventilate to a target $EtCO_2$ of 35 to 45 and $SaO_2 \geq 94\%$ iii. Assist patient's own respirations and interpose breaths as needed iv. Two-handed seal with one-handed squeeze of bag is preferred. v. Continuous $EtCO_2$ waveform monitoring	▪ $EtCO_2$ must be continuously monitored from the onset of manual ventilations (with and without adv. airway in place). ▪ Bag-Valve-Mask use is a TWO PERSON procedure. ▪ Deliver each breath over 2 seconds, one handed squeeze. ▪ If BVM ventilations are effective and the patient's airway is clear, do not continue to advanced airway without a clear indication of need. ▪ To document $EtCO_2$ findings, push "print" on the LP12. ▪ Consider need for chest decompression if progressive decrease in lung compliance with positive pressure ventilation
	DO NOT use ETT with pediatric patients (**≤8yo**)	
5	Supraglottic Airway or Endotracheal Intubation i. If airway continually compromised - *or* - no gag reflex ii. Intubation will be performed by the PM2 who is MOST experienced in successful intubation. iii. Apply Oxygen via NC at 15 lpm prior to and throughout the intubation iv. $EtCO_2$ is to be placed PRIOR to the first breath delivered through the advanced airway v. If ETT attempted, 2 attempts maximum per patient, total. If unsuccessful, move to different airway plan vi. If successfully placed endotracheal tube is dislodged (extubated), replace with supraglottic airway	▪ A "continually compromised airway" is one in which the free flow of air cannot be maintained with basic airway positioning and use of suction. ▪ Endotracheal intubation is NOT a student paramedic function. ▪ Use of high flow oxygen by NC device can provide passive oxygenation and help to prevent hypoxia during endotracheal intubation procedure.

Difficulty Breathing – Trauma Patient (v. 2013.1)

Implement interventions in an escalating fashion, stopping at the point that the Airway Objectives have been met. Function only within your EMS System defined scope of practice. **Progression into algorithm requires accounting for all steps IN SEQUENCE.**

Objectives and Guiding Principles

Airway Objectives:

1. Maintenance of a patent airway, considering the potential for cervical spine injury.
2. Proper ventilation of alveoli utilizing appropriate oxygen flow.
3. Maintain $EtCO_2$ between 35% to 45%.
4. Maintain SaO_2 ≥94% (Permissive hypoxia in severe COPD patients on supplemental oxygen: target SaO_2 ≥90%)

Best Practice:

- Use the least amount of intervention necessary to accomplish airway objectives, given the patient's needs.
- $EtCO_2$ should be used with all critical patients and when necessary for clinical diagnosis.
- $EtCO_2$ must be continuously monitored from the onset of manual ventilations (both with and without an advanced airway in place). $EtCO_2$ is to be placed PRIOR to the first breath delivered through an advanced airway.
- $EtCO_2$ is to be continuously monitored in all trauma patients with altered mental status
- SaO_2 values lag behind actual hypoxia. The $EtCO_2$ is a more reliable and real-time indicator of patient ventilatory status.

	Interventions	Keys to Application of Interventions
1	Open Airway if needed and accommodate position of patient preference for ease of breathing whenever possible Account for potential cervical spine injury (T1, T2)	▪ Airway maneuvers and processes must consider spinal immobilization needs of the patient. Elevate LSB if needed.
2	Oxygen Administration i. Maintain SaO2 at > 94% ii. EtCO2 is to be continuously monitored in all trauma patients with altered LOC/Head Injury	▪ SaO_2 values trend behind actual PaO_2. Use SaO_2 for trending. Use $EtCO_2$ in all patients with altered mental status. ▪ Hypoxia to be avoided with Altered LOC/Head Injury ▪ $EtCO_2$ nasal cannula devices are used to provide real time data in a critical patient OR to make a differential diagnosis.
3	Chest Decompression i. If indicated, follow protocol (T-1)	▪ Clinical setting: patient with risk for closed pneumothorax AND findings of tension pneumothorax ▪ Findings may include: progressive decrease in lung compliance with BVM ventilation, signs of progressive cardiovascular compromise, JVD, absent or decreased breath sounds on affected side, hyperresonance to percussion on affected side, tracheal deviation (late sign).
4	Positive Pressure Ventilation i. Use OP/NP, if tolerated ii. Ventilate to a target EtCO2 of 35 to 45 and SaO2 >94%. If S/S of herniation, hyperventilate only to maintain EtCO2 30-35, no lower iii. Assist patient's own respirations and interpose breaths as needed iv. Two-handed seal with one-handed squeeze of bag is preferred. v. Continuous EtCO2 waveform monitoring	▪ EtCO2 must be continuously monitored from the onset of manual ventilations (with and without an advanced airway). ▪ Bag-Valve-Mask use is a TWO PERSON procedure. ▪ Deliver each breath over 2 seconds, one-handed squeeze. ▪ If BVM ventilations are effective and the patient's airway is clear, do not continue to advanced airway without a clear indication of need.
	DO NOT use ETT with pediatric patients **(≤8yo)**	
5	Supraglottic Airway or Endotracheal Intubation i. If airway continually compromised - *or* – has no gag reflex ii. Intubation will be performed by the PM2 who is MOST experienced in successful intubation. iii. Apply Oxygen via NC at 15 lpm prior to and throughout the intubation iv. $EtCO_2$ is to be placed PRIOR to the first breath delivered through the advanced airway v. If ETT attempted, 2 attempts maximum per patient, total. If unsuccessful, move to different airway plan vi. If successfully placed endotracheal tube is dislodged (extubated), replace with supraglottic airway	▪ A "continually compromised airway" is one in which the free flow of air cannot be maintained with basic airway positioning and use of suction. ▪ Endotracheal intubation is NOT a student paramedic function. ▪ Use of high flow oxygen by NC device can provide passive oxygenation and help to prevent hypoxia during endotracheal intubation procedure. ▪ Head injury patients have worse outcomes when intubated in the field.

Rationale: To provide guidance for use of CPAP within the framework of the **AIRWAY MANAGEMENT Procedure – Difficulty Breathing - Medical (P – 10)**.

Background: CPAP offers spontaneously breathing patients in acute respiratory failure additional ventilatory support without the risks associated with invasive airway management (such as endotracheal intubation). Acute respiratory failure is respiratory dysfunction leading to potentially life-threatening abnormal gas exchange for any of a number of reasons: inadequate minute ventilation, inadequate delivery of oxygen to tissues, inadequate removal of CO2 from blood. CPAP has proven benefit and reduces morbidity and mortality in patients with acute exacerbations of pulmonary edema and chronic obstructive pulmonary disease. It can also be used to help support oxygenation and ventilation in the EMS care phase in patients with acute respiratory failure for other reasons, including pneumonia. It requires spontaneous breathing at an adequate rate with either inadequate tidal volume or inadequate intra-alveolar oxygen or pressures to allow adequate blood oxygenation. Recall: minute ventilation = respiratory rate x tidal volume (with approximately 150 ml of tidal volume to dead space and thus not contributing to oxygenation).

Indications: CPAP is indicated on standing orders for spontaneously breathing adult patients with acute respiratory failure due to:

- pulmonary edema
- COPD
- exacerbation of degenerative neuro-muscular disease (or superimposed pneumonia) that results in inadequate minute ventilation.

Acute respiratory failure may be suspected on the basis of:

- Significant hypoxia (<88%)
- Hypercarbia (>45), or CO2 above baseline levels
- Increased respiratory rate with inadequate tidal volume and elevated EtCO2
- Tripoding, air hunger, diaphoresis, gasping, significant accessory muscle use

Contraindications/ Precautions:

Contraindicated:

- Facial deformities preventing adequate mask seal
- Apnea or decreased respiratory rate
- Inability to follow commands / coaching on CPAP
- Acute traumatic chest injury or pneumothorax
- Active vomiting and/or upper GI bleed

Precautions:

- Significant facial hair (beard) that prevents adequate mask seal.
- Caution in hypotensive patients, as positive pressure ventilation (CPAP, BVM, positive pressure ventilations to ETT or CBT) may further reduce preload by decreasing venous return due to increased intrathoracic pressure. Providers should consider fluid bolus (**FLUID RESUSCITATION, P – 42**) to support

hemodynamics in such patients, as any active airway intervention will have the same hemodynamic impact. If uncertain, contact medical command to discuss options.

- CPAP is likely to ultimately fail in patients with GCS ≤ 13, RR ≥ 30, pH 7.25, pneumonia or adult respiratory distress syndrome. However, a trial of CPAP is appropriate if the provider feels it is indicated based on patient assessment, and is by far preferred to endotracheal intubation. A trial of CPAP may offer the patient improved oxygenation and ventilation during the EMS phase and make RSI / intubation safer on arrival at the hospital.

Necessary Equipment

RESCUER Emergency CPAP System
Oxygen source

Necessary Monitoring

Continuous cardiac rhythm monitoring
Continuous pulse oximetry
Waveform capnography and EtCO2 via nasal prongs
Frequent BP reassessment (ideally every 5 minutes)

Procedure:

- The key to successful use of CPAP in a patient who has not used it before is coaching and explanation of the process as well as the opportunity for the patient to control the mask initially when possible.
- Ensure all components of the RESCUER Emergency CPAP System are present, assembled and working.
- Ensure oxygen flow is at 8 LPM at all times.
- The PEEP valve should be set at 5 cmH2O before applying device to patient. Inspect unit to ensure anti-suffocation port is OPEN, not blocked, and that the MDI port cap (red) is in place.
- Explain procedure to patient, including that oxygen will be blowing through the mask and that it will take a few minutes to get the seal right and for them to get used to the sensation of the air blowing in their lungs. Some patients will require more coaching that the mask will not suffocate them.
- Remove one of the top side straps so headgear doesn't obstruct patient's view.
- Verify the oxygen source has sufficient reserve to ensure continuous operation.
- Hand the mask to the patient coaching them to hold mask to face, or assist patient in holding mask to face reminding them the seal is very important.
- Instruct the patient to take slow, deep breaths.
- Once the patient is comfortable with the mask, coach them and apply the headgear over their head.
- Adjust the head straps until the mask has minimal cushion leak and fits comfortably.

Adjust the upper side straps first, making sure they are above the ears. Adjust the lower side straps, making sure the headgear securely fits the back of the head. DO NOT OVERTIGHTEN as this can cause or worsen leaks.

- Ensure the MDI (red) and supplemental oxygen ports (black) are capped.
- Adjust PEEP as necessary, allowing 3-5 minutes (preferably 10) for patient to equilibrate with each change before further adjustments are made. The goal is to reach the lowest pressure needed to adequately ventilate the patient. Higher PEEP results in greater negative hemodynamic impact.
- **MAXIMUM PEEP on standing order: 10 cm H2O**. Call for orders for higher PEEP if needed.
- Nebulized medications can be administered when attached to a T-connector (not included) and placed between the PEEP valve and the mask. The T-connector components necessary to use the nebulizer should be obtained from a Nebulizer to BVM Deluxe Kit (Life Assist). Do not use the T-connector from the nebulizer itself, as it does not have a spring valve assembly, which is necessary to maintain the CPAP pressures when refilling the medication chamber on the nebulizer. The additional flow of nebulized medication will not affect CPAP pressures.
- Advise receiving facility as soon as practical of patient on CPAP being transported so they can prepare.
- Goals of therapy—balance the appropriate priority based on patient presentation and history. More than is needed to relieve symptoms or "normal" is not necessarily better in these patients:
    - Decreased air hunger.
    - Oxygen saturation of ≥ 94%. Chronic COPD patients tolerate hypoxia better, and an oxygen saturation of 90% may relieve their symptoms and be adequate.
    - Normalization of respiratory rate (decreased tachypnea)
    - Normalization of EtCO2. This means a downward trend in a patient with increased EtCO2. Patients who have end stage COPD may have chronically elevated EtCO2 as high as 50s-60s, and thus tolerate elevated EtCO2 better (and be at greater risk of hypoxia if this is acutely lowered significantly) so this may not be a good target.
- Once initiated and patient is tolerating mask, DO NOT discontinue CPAP until patient is on the emergency department stretcher and hospital CPAP is immediately available for patient to be switched over, or physician is at bedside and requesting CPAP be discontinued. Breaking the CPAP mask seal causes a significant decrease in airway pressures and may lead to abrupt decompensation due to atelectasis and alveolar collapse.
- If patient deteriorates (i.e. worsened mental status, increasing EtCO2, vomiting), remove CPAP and pursue other airway management options as per **AIRWAY MANAGEMENT (P-10)**.

Documentation:

Patient care documentation should include:

- Indication for CPAP (i.e., COPD with acute exacerbation and inadequate oxygenation / ventilation based on increased resp rate and EtCO2 and decreased oxygen saturation)
- Pre-CPAP vital signs including lung exam, respiratory rate, oxygen saturation, blood pressure, pulse, EtCO2 and capnograph waveform.
- Time CPAP initiated
- Patient response to CPAP
    - able to tolerate or not
    - final PEEP setting
    - airway objectives met (Oxygen sat? Decreased resp rate? Normalized EtCO2?)
    - repeat vital signs
- Monitor strip reflecting continuous cardiac monitoring, intermittent vital signs, continuous pulse oximetry and EtCO2 monitoring.

Considerations:

- In patients with a significantly prolonged expiratory phase as indicated by capnograph, in-line albuterol / ipratropium should be provided via CPAP.
- In patients with cardiogenic pulmonary edema, give aspirin (if appropriate) prior to CPAP placement. Nitroglycerin paste should be used instead of sublingual nitroglycerin to avoid repeated removal of CPAP mask.
- Patients with a "do not intubate" order may still benefit from ventilatory support using CPAP.

Rationale: To provide guidance for use of Positive End Expiratory Pressure (PEEP). CPAP application is covered separately in **CPAP PROCEDURE (P-12).**

Background: Extrinsic PEEP may be applied as part of positive pressure ventilation, either via BVM, CPAP, or mechanical ventilation via endotracheal tube. Up to 5 cm H2O of PEEP is considered physiologic. PEEP improves oxygenation or decreases risk of developing hypoxemia, by increasing functional residual capacity (FRC), and tidal ventilation and may assist in meeting airway objective as noted in **AIRWAY MANAGEMENT Procedure (P-10)**. This in turn decreases intrapulmonary shunting of blood and better matches perfused lung to ventilated lung tissue, thus improving arterial oxygenation. It does not open fully collapsed alveoli, but reexpands partially collapsed ones. It does not decrease extravascular lung water, but redistributes it. Higher levels of PEEP are particularly useful in patients with Acute Respiratory Distress Syndrome (ARDS). Excessive PEEP overdistends alveoli, increases dead space and work of breathing, reduces lung compliance, and compresses alveolar capillaries, reducing oxygenation and risking pulmonary barotrauma. Increased intrathoracic pressure can progressively decrease cardiac output, and is most notable when PEEP is greater than 15 cm H2O.

Indications:
Patients requiring positive pressure ventilation with suspected ARDS, pulmonary edema, or other conditions with alveolar atelectasis in whom airway objectives (Proper ventilation of alveoli utilizing appropriate oxygen flow, maintain EtCO2 between 35% to 45%, maintain SaO2 90-94%) are not being met without PEEP. PEEP may be added as below to determine whether it will allow those objectives to be met.

Contraindications/ Precautions:
There are no absolute contraindications to PEEP in BVM or intubated patients. The higher the level of PEEP (over 5 cm H2O), the more likely the patient will experience a variety of adverse consequences, both ventilatory and hemodynamic.

Caution in patients with:

- Hemodynamic compromise (i.e., hypovolemia, hypotension)
- Supraglottic airway (Combitube, King) – risks additional gastric distention and not likely to improve oxygenation
- Pulmonary embolism
- Unilateral or focal lung disease (i.e., pneumonia)
- Bronchopleural fistula
- Intracranial abnormalities
- Asthma

Necessary Equipment
PEEP valve (up to 20 cm H2O) or CPAP System

	
PEEP Valve for Ambu Bag	PEEP Valve setting indicator: marked at increments of 5, the bottom of the red cap indicates the current setting. It can be adjusted anywhere between the markings to approximate the desired setting (i.e. a setting of 12 would obscure the number 10 but not reach the visible 15 line)

Necessary Monitoring

Continuous cardiac rhythm monitoring
Continuous pulse oximetry
Waveform capnography and EtCO2
Frequent BP reassessment (ideally every 5 minutes)

Procedure:

Standing Orders:

- Up to 5 cm H2O PEEP via BVM is indicated on standing orders for adult patients requiring positive pressure ventilation via BVM, CPAP, or mechanical ventilator via endotracheal tube.
- PEEP may be titrated up to 10 cm H2O as described below in Procedure section to meet the Goals of Therapy with regard to oxygenation and EtCO2.

Medical Director Orders:

- For all PEEP above 10 cm H2O, and for mechanically ventilated patients.

- PEEP should be started at 5 cm H2O. This is the same setting that is used as the starting point for CPAP. If after several minutes, oxygenation remains at an unacceptable level (<90-94% on max flow oxygen depending on patient situation), slowly increase PEEP in 2-3 cm H2O increments every few minutes.
- If patient is intubated (oral or tracheostomy) on a mechanical ventilator, and being transferred using BVM ventilation only, the PEEP valve should be set to match the ventilator PEEP setting. You will need to take care not to break the closed circuit or the pressure will be lost.
- **MAXIMUM PEEP on standing order: 10 cm H2O**. Call for orders for higher PEEP if needed, even if patient is already on that setting on a hospital

ventilator. Any mechanically ventilated patient requires Medical Director Consult prior to transfer regardless.

- In patients with PEEP over 5 cm H2O, if monitoring reveals a downward trend in cardiac output (decreased BP) that is suspected due to addition of PEEP, a fluid bolus may be administered. If cardiac output does not improve, PEEP should be discontinued.
- Objectives of therapy—balance the appropriate priority based on patient presentation and history. More than is needed to relieve symptoms or "normal" is not necessarily better in these patients:
    - Oxygen saturation of ≥ 90-94%. Chronic COPD patients tolerate hypoxia better, and an oxygen saturation of 90% may relieve their symptoms and be adequate. For ARDS patients, 88-90% may be adequate and prevent use of excessive PEEP or loss of cardiac output.
    - Normalization of EtCO2. This means a downward trend in a patient with increased EtCO2, but may not be a good target in end stage COPD patients with chronically elevated EtCO2.
    - Monitor EtCO2 waveform carefully to assess for development of autoPEEP due to inadequate exhalation (EtCO2 does not return to 0 baseline).

Documentation:

See **PATIENT DOCUMENTATION Procedure (P-2)** for specifics of CPAP / PEEP documentation.

Considerations:

- If patient is on CPAP and decompensates and requires BVM ventilation, PEEP should be started back at 5 cm H20 and titrated up.

SPINAL MOTION RESTRICTION P – 22

Replaces "Spinal Immobilization Procedure" v2.1 (4-1-14)
PROCEDURE Reviewed & approved by MSSC PAC 10-30-13, 3-11-14 Effective 4-1-14

Rationale: To provide guidance for use of spinal motion restriction in trauma. "Spinal motion restriction" is defined as application of a cervical collar and maintenance of the spine in neutral alignment. "Spinal immobilization" is defined as application of a cervical collar and long backboard for immobilization of the spine and will no longer be used effective the date of this procedure.

Indications: Spinal motion restriction is indicated for:

- Focal neuro deficit on motor or sensory exam
- High risk patients:
  - Ejection from vehicle
  - Motorcycle crash > 20 mph
  - Auto vs. pedestrian or bike at > 20 mph
  - Axial load to head (i.e. diving)
  - Fall from 3x patient's height
- Low risk patients who do not meet all the exclusion criteria on **SPINAL MOTION RESTRICTION Protocol (T-2)**
  - Patient not reliable and competent
    - Not at baseline level of alertness
    - Evidence of clinical intoxication
    - Distracting injury
    - Unable to communicate adequately
  - Point tenderness on palpation of spinous processes

Contraindications/ Precautions:

- There is no patient benefit to applying a cervical collar to patients who do not have any of the above indications for spinal motion restriction.
- Patients with penetrating trauma have worse outcomes with use of long backboards. If a neuro deficit is noted, cervical collar and spinal motion restriction as described in this procedure may be used for appropriate patient management.

Necessary / Optional Equipment

- Appropriately sized cervical collars
- Ambulance cot
- (optional) Long backboard
- (optional) KED
- (optional) Soft patient movers

Procedure:

- Perform an appropriate trauma assessment (see **TRAUMA MANAGEMENT Protocol (T-1)** and **APPROACH TO TRAUMATIC INJURY Procedure (P-26)**
- Evaluate patient using **SPINAL MOTION RESTRICTION Protocol (T-2)**
- If patient meets criteria for spinal motion restriction, they should be transported flat and supine on the cot unless they meet conditions set forth in Special Situations as detailed below. Reinforce to patient the importance of limiting movement of cervical spine and encourage neutral positioning.

- Perform a brief neurologic assessment to assess presence of movement and sensation to light touch in all extremities
- Place an appropriately sized cervical collar after evaluating the cervical spine for point tenderness and step-off (and evaluating the neck for other injuries / findings)
  - If there is no appropriately sized cervical collar for a specific patient, attempt to limit patient movement of cervical spine while they transfer to cot. Reinforce to patient the importance of limiting movement of cervical spine and encourage neutral positioning.
- Ambulatory patients: If patient has been ambulatory on scene, or is neuro intact and able to self-extricate from a vehicle / situation, preferred management is to bring the cot to the patient and have patient sit down and then lay flat on the cot.
- Nonambulatory patients: If patient is non-ambulatory or requires movement / extrication, a long spine board may be used only as an extrication tool. Once extricated with the cervical collar in place, transfer the patient from the spine board, maintaining neutral spine alignment throughout the process and lay the patient flat on the cot.
- KED may be used as an extrication tool if no other satisfactory method is available. It is not to be used for neuro intact patients seated in vehicles. KED should not be used in patients who require rapid extrication. If a KED is used, it should be unbuckled and fully released (including head straps) once the patient is laid flat on the cot.
- Special situations:
  - Dyspneic patients: If the patient is dyspneic with the cervical collar while laying completely flat, it is acceptable to slightly elevate the head of the cot (NO MORE than 20 degrees).
  - Vomiting: If the patient has repeated vomiting, it is acceptable to place the patient on their side to facilitate protecting the airway.
  - Third trimester pregnancy: It is acceptable to elevate the head of the cot (no more than 20 degrees) or place the patient on their left side to facilitate adequate venous return.
  - Particular attention should be paid to documenting the patient's neuro status in these alternate positions.

Considerations

- Patients in traumatic cardiac arrest should be transported on a hard surface that facilitates adequate CPR. This may be a long backboard or short CPR-type board under the thorax.

Rationale: To provide guidance on when needle chest decompression should be considered for management of possible tension pneumothorax, and how to perform the procedure when indicated within the framework of the **AIRWAY MANAGEMENT Procedure, P-10**. This procedure provides guidelines for when this invasive procedure is appropriate, since EMS chest decompression automatically leads to placement of a chest tube and hospitalization in live patients.

Indication:

- Suspected tension pneumothorax
  - In ADULT patients in traumatic or medical **cardiac arrest**: standing orders when indicated. Indications may include:
    - Trauma: Cardiac arrest with PEA or asystole and blunt or penetrating traumatic injury to the chest.
    - Medical: Cardiac arrest with PEA or asystole and history strongly suggestive of pneumothorax as etiology for arrest (i.e. severe COPD or asthma with Valsalva or positive pressure ventilation history).
  - In ADULT patients **with a pulse**, patients must meet the following findings to be considered for chest decompression on standing order:
    - **MUST** have:
      1. **Acute and progressive respiratory distress**, including decreasing lung compliance and greater difficulty ventilating patient without other apparent etiology.
      2. Appropriate mechanism:
         a. Medical: history suggestive of pulmonary bleb rupture (COPD, severe asthma) with positive pressure ventilation; acute decompensation of chronically ventilated patient without any airway problem
         b. Trauma: blunt or penetrating chest trauma
      3. Signs of shock: progressive tachycardia and/or adult SBP< 90 mm Hg
    - **AND at least three** of the following:
      1. Unilateral decreased or absent breath sounds
      2. Unilateral hyperresonance of chest on percussion
      3. Oxygen saturation < 90% in spite of maximum oxygen supplementation
      4. Jugular vein distension
      5. Subcutaneous emphysema
      6. Tracheal deviation (away from the affected side) – late sign
  - Paramedics may seek online medical command orders for pediatric patients or adult patients if they still feel the patient requires the procedure but does not meet criteria under standing orders.
  - If patient has an occlusive dressing placed on a penetrating chest wound, this should be removed and patient reassessed for improvement before needle chest decompression is attempted.

Contraindications/ Precautions:

- DO NOT use on pediatric patients
- Not recommended for large fluid accumulations or with suspected hemothorax
- Needle should not be placed through an area of possible cellulitis
- Because the chest wall is not as thick laterally as anteriorly, in obese patients, the lateral insertion site may be more likely to reach the pleural cavity
- A simple pneumothorax in a patient with pulses may have similar signs as an early tension pneumothorax. In a pulsatile patient, the **key is noting the progression of respiratory distress and development of shock without other apparent etiology**, particularly in those who are receiving positive pressure ventilation.

Necessary Equipment

- ARS Decompression Needle
- Asherman Chest Seal
- Saline flush syringe
- Chloraprep or other aseptic prep such as alcohol prep

Necessary Monitoring

- Patient should have critical-level monitoring (vital signs about every 5 minutes in patient with a pulse) including pulse oximetry.
- Breath sounds and hemodynamic status should be re-evaluated following insertion of device.

Procedure

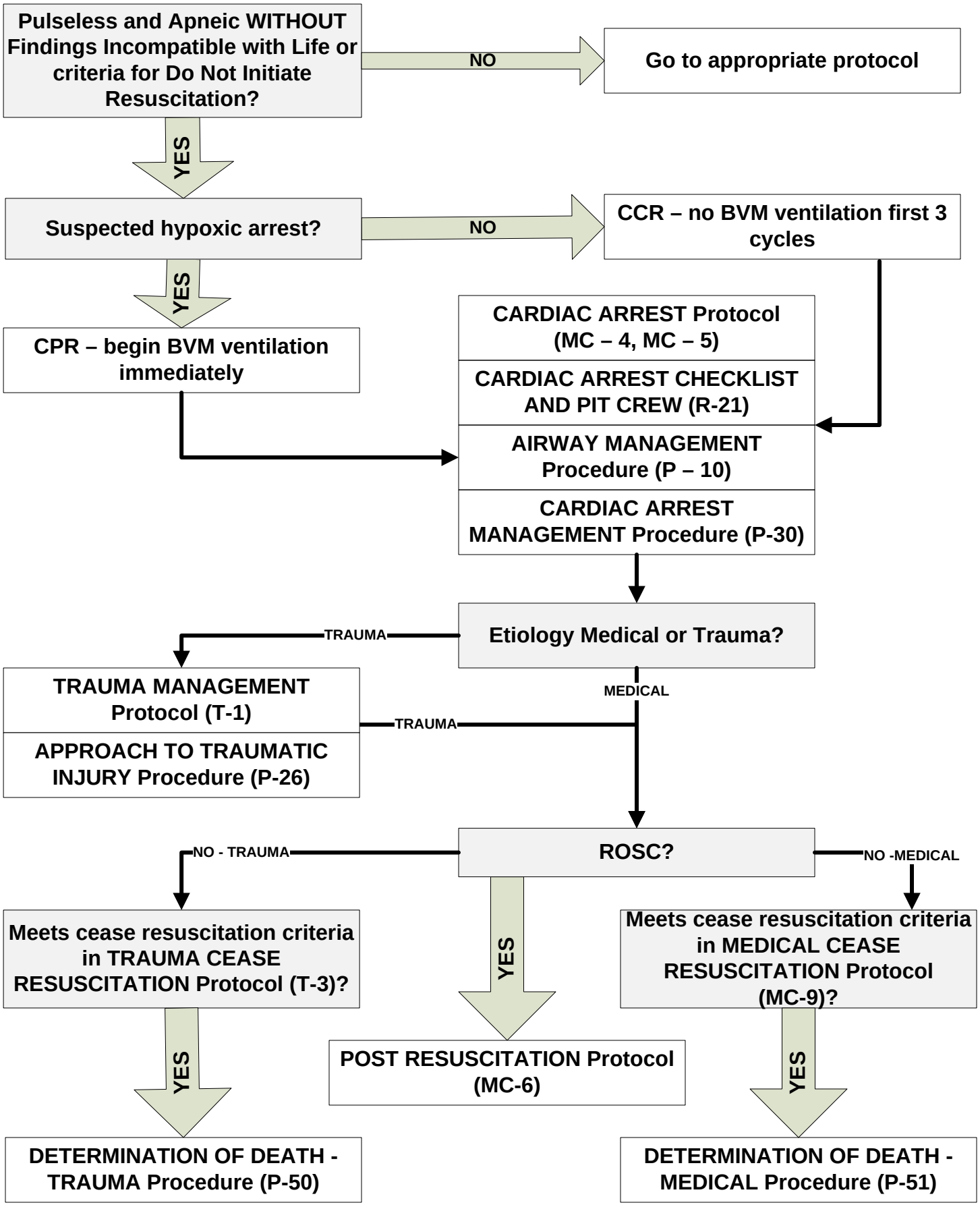
- Confirm patient meets indications for needle chest decompression for suspected tension pneumothorax as above. Obtain physician order unless standing order criteria apply.
- Find landmarks for insertion site
    - Preferred position is in the 2nd intercostal space at the midclavicular line.
    - Alternate position is in the 5th intercostal space in the anterior - axillary line if unable to access preferred position or if patient very obese.
- Discard ½ of the saline from the Saline Flush syringe
- Assemble syringe onto ARS needle
- Prep site using the chloraprep or other aseptic prep such as alcohol prep
- Insert ARS needle, bevel up, at a 90 degree angle to the chest wall, aspirating as needle is inserted over the top of the rib. Ensure ARS entry into the chest is **not** medial to the nipple line and **not** directed toward the heart
- Once thru the pleura, bubbles should aspirate freely into syringe. Withdraw the syringe and needle, leaving the catheter in place.
- Place Asherman chest seal over catheter to provide one-way valve and prevent recurrent tension pneumothorax.
    - Dry the area around the insertion site
    - Remove protective liner from adhesive
    - Place with the valve directly over the catheter, adhesive side down, pressing firmly to assure an occlusive seal.

Documentation

See **PATIENT CARE DOCUMENTATION (P-2)**, Chest Decompression Documentation section

CARDIAC ARREST MANAGEMENT PROCEDURE OVERVIEW FLOWCHART

P - 30
Effective 10-1-2014



Rationale: To provide guidance on how to most effectively manage cardiac arrest and integrate modalities specific to WSC EMSS into a complete approach to cardiac arrest and post-resuscitation management, and to further explain the linkage between the various protocols, procedures and references that may apply to the management of patients in cardiac arrest, both trauma and medical.

Background:
There are several components and concepts that are central to successful cardiac arrest management and positive patient outcomes in EMSS.

1. Cardiocerebral resuscitation (CCR) is designed to produce and sustain the highest possible aortic pressure. This promotes improved cerebral perfusion for the patient in cardiac arrest while still providing for passive ventilation and oxygenation. In patients with suspected primary cardiac events, this method will be used.
2. Metronomes are integrated into CCR to promote a compression rate and ratio in the range that has been shown to be related to positive patient outcomes.
3. Capnography is integrated into CCR to promote awareness of patient perfusion status, early awareness of ROSC, ability to modify compression quality to promote the best possible perfusion, and to gauge when further resuscitation efforts are futile.
4. Pit Crew is a choreographed team approach which assigns personnel on cardiac arrests to assure that vital tasks are completed in a timely and integrated manner and the best possible, minimally interrupted compressions are provided to the patient.
5. Cooling is the out of hospital initiation of chilled saline therapy. The target is to give every cardiac arrest 1.5L of chilled saline prior to hospital arrival. Ideally, chilled saline should be initiated intra-arrest.
6. Evaluation is essential to measuring our performance and includes annotation of individual cardiac arrests and provider feedback on metrics, partnership with hospitals to understand patient outcomes, ability to aggregate data to evaluate impact of changes in approach on patient outcomes.

Pertinent Items:

CARDIAC ARREST CHECKLIST AND PIT CREW Reference (R-21)
CARDIAC ARREST – PEDIATRIC Protocol (MC-4)
CARDIAC ARREST – ADULT Protocol (MC-5)
NEWBORN RESUSCITATION Protocol (M-13)
AIRWAY MANAGEMENT Procedure (P-10)
MEDICAL CEASE RESUSCITATION Protocol (MC-9)
DETERMINATION OF DEATH – MEDICAL Procedure (P-51)
TRAUMA MANAGEMENT Protocol (T-1)
APPROACH TO TRAUMATIC INJURY Procedure (P-26)
TRAUMA CEASE RESUSCITATION Protocol (T-3)
DETERMINATION OF DEATH – TRAUMA Procedure (P-50)
POST-RESUSCITATION Protocol (MC-6)
ENVIRONMENTAL EMERGENCIES (M-7)
LUCAS MECHANICAL CPR Procedure (P-37)

Indications: Patients who are or become pulseless and apneic before or during EMS care and do not meet criteria of “findings incompatible with life” or “do not initiate resuscitation.”

Necessary Equipment:

All available equipment below should be brought immediately to patient's side

- AED or Monitor / Defibrillator with waveform capnography
- Metronome
- Cardiac arrest checklist
- BLS triangle
- Standard jump bag
- Airway management equipment including oxygen and suction

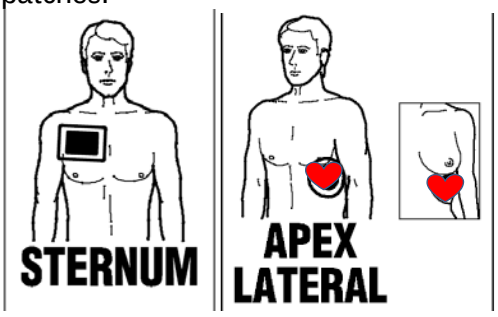
Ideally, vascular access equipment, necessary medications and fluids including chilled (medical) or warmed (trauma) saline should be brought immediately, however, shortly after patient contact is acceptable.

Appropriate PPE should be worn. Individuals involved in active airway management / suctioning should wear at least eye protection and mask in addition to gloves. If there is significant blood or body fluids, additional PPE may be required.

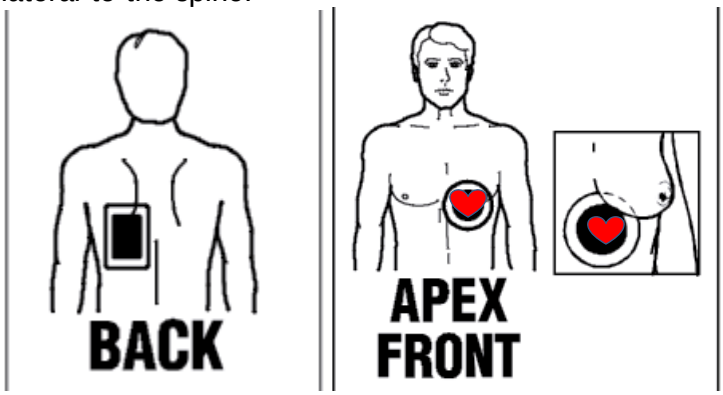
LUCAS Device may be used as described in **LUCAS MECHANICAL CPR Procedure (P-37)** if available.

Procedure: Any Cardiac Arrest:

- Newborns are to be managed as described in **NEWBORN RESUSCITATION Protocol (M-13)**
- Based on personnel available, implement either BLS triangle alone to start, or the full BLS and ALS components of Pit Crew.
- Initiate chest compressions at a rate of 110/minute, delivered in cycles of 220. Cycles are driven by compression cycles (220), not clock time
  - Immediately turn on metronome and ensure rate set at 110/minute
  - Turn on AED or monitor / defibrillator.
    - Place defib pads in a way that will allow proper LUCAS placement later if needed.. Adequate contact is essential to proper defibrillation. If needed, spread skin folds apart to create a flat surface to promote good electrode contact, in thin patients, follow the contour of the ribs to limit air under the electrode. If only adult AED and pads are available, it is acceptable to use them on a pediatric patient in the antero-posterior configuration.
  - There are 2 options for pad placement:
    - Antero-lateral/apex: Adult or large child. Place the ♥ electrode lateral to the left nipple in the midaxillary line, centering the electrode in the midaxillary line. Place the other electrode on the right upper torso, lateral to the sternum and below the clavicle. Avoid any implanted devices or medication patches.



- Antero-posterior: alternate method for adults, preferred method for pediatrics. May be used in addition to antero-lateral if dual sequential defibrillation is used (this intervention is physician order only). Place the ♥ electrode to the left of the sternum halfway between the xiphoid process and left nipple, with the upper edge of the electrode below the nipple line. Place the positive electrode on the left posterior chest beneath the scapula and lateral to the spine.



  - Compress chest to the appropriate depth (see below) in sync with metronome rate.
  - Compressor calls out every **17, 18, 19**.
  - Position 3 calls out the number every 20 compressions (20, 40, 60. . . to 220)
  - At 180, Position 3 calls out "**Code Commander 180**" to get Code Commander (CC) attention
- At 180, CC is checking femoral pulse with compressions, charging defibrillator, evaluates the ETCO2, is ready to analyze the rhythm, and evaluates for presence of a pulse with CPR.
- At 220 compressions, position 3 calls out "**220 clear**" to assure everyone clears the patient.
- At "**220 clear**", the compressor stops, automatically clears from the patient, and begins counting the pause with the metronome saying "**5 – 10 – 15/START"** out loud.
  - The only things that should happen during the pause are a rhythm/pulse check by the Code Commander who would activate the defibrillator, possibly a defibrillation, and then resuming CPR. Because of this, there is no need to separately "clear" for defibrillation, as the only individual touching the patient is the Code Commander.
  - Automatically restart compressions no later than after the count of 15, which produces a pause of no more than 10 seconds
  - The only reasons to have pauses longer than 10 seconds are
    - if the Code Commander specifically asks to hold CPR for further evaluation of underlying rhythm. This should almost never occur if the Code Commander is attentive to cues
    - evaluation of EtCO2 changes when possible cease resuscitation is being considered
    - patient movement, which should be rare with CPR in progress
  - Shorter pauses are better
  - When Code Commander has analyzed the rhythm and defibrillated if necessary, they will call out "**Start**" or "**Back on the chest**", to notify the new compressor to restart compressions. However, compressions are to restart automatically at the

count of 15 unless the Code Commander intervenes. If defibrillation is not indicated, dump charge as next cycle is initiated.
  - AED: At 220 compressions, Position 2 presses analyze on the AED. Stop compressions to allow AED rhythm analysis. AED's cannot analyze rhythm properly during compressions. Deliver compressions during AED or monitor / defibrillator charging cycle (does not count towards a 220 cycle).
  - Compression targets:
    - Compression Rate of 110/min
    - Compression Depth
      - Adult: at least 2 inches
      - Pediatric: at least 1/3 of AP diameter of chest
      - Compressions should be adequate to at least feel a femoral pulse during compressions
    - Allow complete recoil between compressions
    - Rotate compressors every 2 minutes
    - Compression Ratio of 90% or greater. This means that 90% or more of the time during the arrest, compressions are being done. Any pause over 3 seconds diminishes this percentage
    - CPR Ratio of 95-100%. This means that the percentage of time that compressions and rhythm assessments are being done, any pause over 10 seconds diminishes this percentage
- Follow **AIRWAY MANAGEMENT Procedure (P-10): Escalating Airway Algorithm – Cardiac Arrest**
  - For non-hypoxic medical arrest, begin passive airway management by initiating oxygen at 15 l/min via non-rebreather mask with oral airway. 3 cycles of 220 compressions (660 compressions) will be delivered prior to starting active airway management.
  - For hypoxic (i.e. respiratory) or trauma arrest, begin active airway management immediately by providing positive pressure (BVM) ventilation.
- Compressions will <u>never</u> be interrupted for placement of an airway or for vascular access.
- When sufficient personnel are available, one person continuously monitors compression quality by femoral pulse palpation, both during resuscitation as well as following ROSC. This will also expedite determination of presence of pulse when compressions are halted, or there is a change in pulse quality in the post-resuscitation period.
- Vascular access: See **VASCULAR ACCESS Procedure (P-40)** and **INTRAOSSEOUS Procedure (P-41)**. Vascular access placement should not interfere with the BLS triangle. For intraosseous use in cardiac arrest:
  - Proximal humerus location is preferred.
  - The Paramedic should coordinate with compressor switches to select the intraosseous insertion site and move out of the BLS triangle within the 220 compressions being done on the other side of the patient. If positioned properly, the paramedic should be next to the patient's head or certainly out of the compressor's location when placing IO.
  - Place an extra extension set on IV setup so it can be taped to arm and paramedic can reach it from their proper position for medication administration.

- For hypothermia or hyperthermia, see **CARDIAC ARREST MANAGEMENT OVERVIEW FLOWCHART** and **ENVIRONMENTAL EMERGENCIES (M-7)** for specific modifications to defibrillation and medication management.
- When patient is transported post-resuscitation, adequate personnel to staff the BLS triangle should be in the patient compartment of the ambulance should the patient rearrest. Alternatively, if a mechanical CPR device is available, it should be applied by the Division Leader as described in **LUCAS MECHANICAL CPR Procedure (P-37)** so compressions can immediately resume if the patient rearrests.

Medical Arrest Special Considerations

- ALS care should follow **CARDIAC ARREST – ADULT (MC-5), CARDIAC ARREST – PEDIATRIC (MC-4)** when adequate resources are available to assure that optimal BLS care can continue uninterrupted while ALS care is provided.
- Chilled saline should be initiated intra-arrest in adults as the preferred IV fluid unless the patient is already hypothermic.
- Patients should not be moved with compressions in progress unless absolutely necessary as quality/rate of compressions suffers considerably.
- Monitor/defibrillators are pre-programmed to capture necessary data for cardiac arrest annotation
  - Cardiac / capnography waveforms should be captured with each rhythm change and each patient movement as described in **WAVEFORM CAPNOGRAPHY Procedure (P-7)**. There should be a final strip that reflects asystole if the patient is triaged black or reflects proper airway position and cardiac rhythm / vital signs at the time of patient turnover to receiving facility at the end of EMS care.
  - Medications and events (intubation, ROSC) should be annotated at the time they are given using the monitor
- When considering cease resuscitation, verify the criteria for futility of further resuscitation in **MEDICAL CEASE RESUSCITATION Protocol (MC-9)**, and further described in as below. Times in the **MEDICAL CEASE RESUSCITATION Protocol (MC-9)** are times when providers may consider cease resuscitation, but by no means should they be considered hard and fast. Particularly in patients who are maintaining EtCO2 above 30 with CPR, or who are having rhythm changes, resuscitation should continue. Patients have survived prolonged resuscitations with quality CPR (as indicated by EtCO2 >30) neurologically intact. These criteria are meant to be considered and met in the order presented below and on **MC-9**.
  - Adequate CPR has been performed throughout resuscitation in keeping with **CARDIAC ARREST CHECKLIST AND PIT CREW (R-21)**
  - Adequate airway management has been performed. An invasive / advanced airway (i.e,.ETT or supraglottic airway) is not required or even desirable if airway objectives (including adequate chest rise and EtCO2 exchange) are met with basic airway techniques per **AIRWAY MANAGEMENT Procedure (P-10).**
  - Rhythm-appropriate medications have been administered per **CARDIAC ARREST-ADULT (MC-5)** or **CARDIAC ARREST-PEDIATRIC (MC-4)**
  - Asystole or agonal rhythm (i.e. PEA) > 20 minutes for an adult and >30 minutes for a pediatric, has been present throughout resuscitation in spite of appropriate treatment of possible causes (Hs and Ts)
    - If at any point patient exhibits a shockable or narrow complex rhythm, cease resuscitation should not be considered until at least 30 minutes of

resuscitation have been provided, including appropriate treatment of possible causes.
    - In patients with repeated rhythm changes, resuscitation should continue until patient has been in asystole at least 15 minutes, or a total of at least 30 minutes of active resuscitation.
  - EtCO2 criteria
    - If EtCO2 persistently < 10 with CPR, may consider cease resuscitation by standing order at 20 minutes.
    - If EtCO2 between 10 and 30 with CPR, consider trend and rhythm changes during the resuscitative effort to determine when considering cease resuscitation would be appropriate.
    - If EtCO2 consistently > 30 after several minutes of CPR, do not consider cease resuscitation until at least 30 minutes of resuscitation have been provided.
    - Depending on the complexity of the resuscitation, consultation with either Medical Director or Medical Command Physician in ED is indicated for patients with EtCO2 10 or higher with CPR.
- Patients with pregnancy > 20 weeks and
  - unwitnessed suspected medical arrest should have resuscitative attempts performed on scene
  - witnessed suspected medical arrest should have initial resuscitation and airway management started and then be rapidly transported to Wesley Medical Center with pre-alert

Trauma Arrest Special Considerations:

- Trauma arrest patients include those with acute blunt or penetrating trauma, hangings, asphyxia and drownings.
- Trauma arrest patients should be managed in keeping with **TRAUMA MANAGEMENT (T-1), APPROACH TO TRAUMATIC INJURY (P-26).**
- If patient is pulseless and apneic and has findings incompatible with life as described in **DETERMINATION OF DEATH-TRAUMA Procedure (P-50)**, triage patient black.
- If patient is triage blue, proceed with resuscitation.
- CCR is not to be used in trauma arrest. Compressions and active airway management should be used immediately in keeping with **AIRWAY MANAGEMENT Procedure (P-10): Escalating Airway Algorithm – Cardiac Arrest**
- Basic life support measures should be provided in keeping with **CARDIAC ARREST CHECKLIST AND PIT CREW Reference (R-21),** providing chest decompression when available if indicated as described in **AIRWAY MANAGEMENT Procedure (P-10): Escalating Airway Algorithm – Cardiac Arrest.**
- Assess patient's A – B – C's, initiate basic resuscitative efforts.
  - Airway: open airway with BLS maneuvers, **follow AIRWAY MANAGEMENT Procedure (P-10).** Endotracheal intubation is not permitted in penetrating trauma arrest and head injury.
    - If pulseless and apneic and mechanism for potential tension pneumothorax (i.e. blunt trauma to chest), follow **NEEDLE CHEST DECOMPRESSION Procedure (P-25).**
  - Breathing: evaluate for spontaneous respirations for at least 30 seconds.

- Circulation: check for carotid or femoral pulse AND simultaneously listen with a stethoscope over the cardiac apex for at least 30 seconds. Apply cardiac monitor to assess for cardiac rhythm. A pulse may not be felt in a profoundly hypotensive patient, but if an organized cardiac rhythm is present, patient should receive full resuscitative efforts appropriate to their injury.
- If cardiac activity on monitor or respiratory effort is noted at any time during assessment or after these interventions are performed, full resuscitation is to continue as described in **CARDIAC ARREST MANAGEMENT Procedure (P-30)**.
- If patient is verified to be pulseless, apneic, and without organized ECG activity (or PEA < 40) after interventions, see **TRAUMA CEASE RESUSCITATION (T-3).**

- While some of our patients may have injuries which are ultimately incompatible with life, if they have a pulse and/or are breathing on EMS arrival, it is expected that full resuscitative efforts will be provided and the patient expeditiously transported to a trauma center unless that is not physically possible due to entrapment.
- Every effort should be made to rapidly gain adequate access to the entrapped patient to assess for signs of life. These patients should be provided whatever assessment and indicated medical interventions are possible given the patient's location.
- For traumatic deaths, it is highly likely that death is not of natural causes (i.e., homicide, suicide, fire), and care should be taken to preserve the scene for law enforcement assessment or coroner assessment while still affording the patient appropriate resuscitation if indicated. A trauma death should be assumed to be a coroner case until the coroner states they are not taking the case.
- Blunt or penetrating trauma arrest:
  - Traumatic cardiac arrest has a dismal outcome. The best opportunity for survival is to move the patient to a Level 1 trauma center as quickly as possible (ideal is less than 10 minutes from arrest, sooner is better) to be evaluated for a cause that can be emergently addressed surgically. These are rare.
  - Rapidly extricate patient, call Trauma alert blue as soon as possible and rapidly transport to a Level 1 Trauma Center.
  - Penetrating trauma arrest should not be managed by attempting to resuscitate the patient on scene. Only initial basic airway and critical interventions (i.e. chest decompression if indicated) should be done as quickly as possible on scene. If ongoing resuscitation is indicated (i.e. patient does not meet criteria in **TRAUMA CEASE RESUSCITATION (T-3)** or provider feels ongoing resuscitation is appropriate), the patient should be transported as quickly as possible and any further interventions provided during transport.
  - Penetrating or blunt trauma arrest does not benefit from prolonged standard basic or advanced cardiac life support / medications. As such, medications and BCLS/ACLS should only be used as bridge treatments en route to the Level 1 trauma center.
  - Vascular access should be obtained enroute to the Level 1 trauma center if needed and time allows.
  - If criteria to cease resuscitation per **TRAUMA CEASE RESUSCITATION (T-3)** are met, there is no specific timeframe that BCLS/ACLS must be performed to consider cease resuscitation.
- Hypoxic trauma arrest:
  - Hypoxic traumatic arrest may include: asphyxia, hanging, drowning, and isolated smoke inhalation (i.e. without significant external trauma or burns).

- If the patient is in hypoxic traumatic arrest, there is no benefit to rapid movement to the Level 1 trauma center.
- In patients with isolated smoke inhalation and suspected cyanide toxicity, Hydroxocobalamin should be given early as per **CARDIAC ARREST-ADULT Protocol (MC-5)** or **CARDIAC ARREST-PEDIATRIC Protocol (MC-5)**
- Resuscitation should be initiated on site. If patient is asystolic and does not respond with any rhythm changes to basic resuscitative efforts in 10 minutes, consider which option is most appropriate for this specific patient:
  - transport to trauma center
  - ongoing resuscitation on site
  - cease resuscitation per **TRAUMA CEASE RESUSCITATION (T-3).**
  - consult receiving facility physician for direction if uncertain.
- Depending on the situation, additional resuscitative effort may be appropriate before cease resuscitation is considered in hypoxic trauma arrest, even when criteria are met.

- Determine if the criteria for cease resuscitation are met per **TRAUMA CEASE RESUSCITATION (T-3).** See **DETERMINATION OF DEATH –TRAUMA (P-50)** for details.
- If patient is resuscitated from trauma arrest, **POST-RESUSCITATION Protocol (MC-6) v3.0** applies.
- If patients in trauma arrest with pregnancy > 20 weeks are transported, they will be taken to Wesley Medical Center with pre-alert.

Post-ROSC Special Considerations:

- Following ROSC, the patient is physiologically delicate and will take some time to stabilize.
- Trauma patients should be gently but rapidly expedited to the Level 1 trauma center. If not done already, provide warmed saline during transport and keep patient warm or protected against further heat loss.
- Medical patients should be allowed a time period to stabilize after ROSC, at least 5-10 minutes before being moved to transport. Obviously, these patients are at risk for re-arrest during this period and jostling should be avoided. This time is a pause point that allows you and the patient to regroup. It allows the resuscitation team to recap what has happened up to ROSC and provides time for a good reassessment of the patient. You should expect some of the following to occur in this immediate post-ROSC period:
  - Rhythm changes and ectopy as the patient begins to clear the lactic acidosis of arrest and experiences further electrolyte shifts due to same.
  - Hypotension which may resolve spontaneously in a few minutes as the patient builds up their cardiac output and their vascular tone begins to return.
  - Elevated EtCO2 which may remain significantly elevated.
- Post-ROSC reassessment should include:
  - Reassessment of the airway and any invasive airway that has been placed, capnography waveform and value, pulse ox placement / waveform if not done already. Document ROSC event on monitor and "print". Assure that oxygenation is optimized and that patient is not being overventilated. While your goal EtCO2 is 35-45mm Hg, if a patient has a significantly elevated EtCO2, it may take some time to clear. Be mindful of good ventilations including allowing adequate time for exhalation, not stacking breaths, tidal volume not being excessive (one-hand

squeeze should suffice), ventilation rate not excessive, and gradually assisting patient in normalizing their physiology.
  - Evaluate for breath sounds and any spontaneous respiratory effort.
  - Evaluate perfusion. Someone (Code Commander or Paramedic) should continuously monitor femoral pulse for rate and quality, your fingers on the pulse will immediately alert you to a change such as weakening pulse (need a fluid bolus?), change in rate, etc.
  - Evaluate patient responsiveness. If patient has an invasive airway, anticipate whether sedation may be required to maintain airway.
  - Evaluate of a full set of vital signs including 12-lead ECG.
  - Think through H's and T's again to assure that any potential issues that either resulted in arrest or may lead to rearrest have been addressed.
  - Evaluate vascular access for security, patency and any hanging drips / fluids / total volume infused. Initiation of chilled saline for medical arrest only if indicated per **POST-RESUSCITATION Protocol (MC-6).** Anticipate any potential repeat medication needs.
  - Re-triage red and notification of hospital of ROSC patient and if STEMI alert needed.
  - Gentle packaging to assure that lines / airway / monitoring all remain in place when transported.
  - Placement of LUCAS device if available in readiness for transport **(LUCAS DEVICE Procedure P-37)**.
  - Coordinated, gentle movement to ambulance.
- Transportation mode:
  - A smooth and safe ride for patient and provider is most important at this point. Red lights and siren are permitted at provider discretion for transport to hospital for medical patients post-ROSC or in persistent cardiac arrest, but are by no means required, particularly since time savings is negligible in the urban and suburban area of Sedgwick County.

Documentation:

See **PATIENT CARE DOCUMENTATION Procedure (P-2)**

Considerations

- It has been shown that in general, family members who wish to be present during resuscitation find it beneficial to them and that they do not interfere with resuscitative efforts. It lets them see that you have "done everything". Providers are encouraged to consider this option and be able to direct family to be present / have contact with their loved one during the resuscitation in a way that doesn't interfere with the resuscitative effort. This may not be realistic until adequate personnel arrive on scene (i.e. the Division Leader) to devote full resources to the resuscitation and also provide family members guidance on what is happening and be able to explain procedures and monitor their response to the resuscitative effort. Some family merely want to be present on the periphery, some want to have contact such as holding a hand, which may be done with the patient's outstretched arm so as not to interfere with the BLS triangle.
- Death during transport should be dealt with on a case-by-case basis with the Division Leader and/or the EMSS Medical Director unless another specific physician has already been providing medical command / consultation for that patient.

- Once death is declared, the EMS role is over. The scene should be preserved for law enforcement and the medical examiner until it is determined that it is not a medical examiner's case or a crime scene.
- The body should not be moved, nor should any of the surroundings be changed / moved / disturbed for any reason (this includes moving / gathering medications, finding ID, etc).
- Gathering of evidence regarding cause of death is not an EMS function but rests solely with law enforcement and the medical examiner's office.

- In the event that a patient has a medical arrest (becomes pulseless and apneic) upon arrival to the emergency department (ED), i.e., in the ambulance bay:
  - Notify ED that the patient has arrested in the parking lot as soon as practical. By radio is likely most efficient.
  - Perform the first six minutes (3 cycles) in the ambulance.
  - If at the end of this period, if the patient is in asystole, move the patient to the ED.
  - If the patient has a shockable rhythm or PEA, the Code Commander should make contact with the charge nurse and physician on duty by radio to provide a situation update.
  - The ED physician and charge nurse will develop a plan on how to proceed, which may include the physician coming to the ambulance to give specific direction, or communicate a decision to continue in the ambulance until the Code Commander decides it is appropriate to move the patient into the ER.
  - Trauma arrest in transit should be moved immediately to the trauma room.

Rationale: To provide guidance on how to provide electrical cardioversion and defibrillation to unstable patients.

Indications: Electrical cardioversion and defibrillation are indicated for treatment of unstable cardiac dysrhythmias as specified in **TACHYCARDIA: ADULT**, MC-3; **TACHYCARDIA: PEDIATRIC**, MC-7; **CARDIAC ARREST: ADULT**, MC-5 and **CARDIAC ARREST: PEDIATRIC**, MC-4.

Contraindications/ Precautions:

Precaution:

- Patients with a functioning AICD which is shocking them should not require external defibrillation. Place pads in case AICD stops sensing and defibrillating appropriately.
- Defib pads should not be placed over an AICD, alternate position should be chosen.

Necessary Equipment

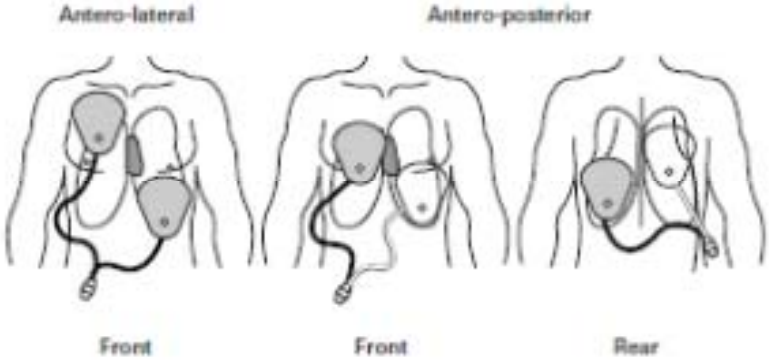
Cardiac monitor / defibrillator
Defibrillation pads

Necessary Monitoring

Continuous cardiac rhythm monitoring

Procedure:

- IV access is preferred, but not required prior to cardioversion or defibrillation
- Place pads in recommended position on right upper chest and left lateral chest with a vector through the heart. Anterior / posterior placement of pads on the left chest is also an acceptable alternative for either cardioversion or defibrillation.



Antero-lateral: Ventricular apex – right infraclavicular area
Antero-posterior: Right sternal body at 3d intercostal space – angle of the left scapula
From Botto GL, et al. 1999. External cardioveresion of atrial fibrillation: role of paddle position on technical efficacy and energy requirements. Heart 82: 726-30.

Cardioversion:

- Consider sedation and analgesia as per protocol.
- Select the lead with the most positive R wave to allow proper sensing.
- Synchronize by turning on the SYNC function
- Select appropriate energy level based on protocol
- If Vfib results from cardioversion, turn off SYNC function and defibrillate as indicated.

Defibrillation:

- Select appropriate energy level based on protocol: 360J for all adult defibrillation
- Charge during ongoing CPR as described in Pit Crew CPR
- Immediately restart CPR following defibrillation

Rationale: To provide guidance for how to perform noninvasive / transcutaneous pacing (TCP).

Indications:
- Symptomatic bradycardia with severe symptoms due to the bradycardia (hypotension / shock, altered mental status, ischemic chest pain, new/worsened CHF)
- Symptomatic bradycardia in patients with STEMI, heart transplant, or high grade block (2d degree Type II, 3d degree)
- Symptomatic bradycardia refractory to atropine

Contraindications/ Precautions:
- Transcutaneous pacing is not indicated for asystole or patients in cardiac arrest (i.e. bradycardic PEA)

Protocols:
- **BRADYCARDIA – ADULT (MC-2)**.

Necessary Equipment

LifePak 15 monitor/defibrillator
QuikCombo pacing / defibrillation pads / therapy cable
ECG leads and cable

Necessary Monitoring

Separate ECG monitoring through ECG leads

Procedure:
- Explain procedure to patient.
- Consider sedation / analgesia.
- Turn monitor defibrillator ON, assure it is set to Manual mode.
- Place ECG electrodes to allow for adequate distance between ECG electrodes and QuikCombo pads. Connect ECG cable and choose Lead I, II or III.
- The ECG must be separately monitored via the ECG electrodes for the pacer to work correctly and sense the patient's native beats.
- Prepare patient's skin for electrode application by cleaning with alcohol pad to remove dead cells and improve conduction. Proper pacing or defibrillation is dependent on good conduction. To prevent burns, ensure that the entire QuikCombo pad adheres to the skin. Air pockets between skin and therapy electrodes can lead to burns.
- Apply QuikCombo pads to the patient using anterior – lateral placement. Anterior-posterior placement is also an option, with the  electrode over the left precordium and the other electrode infrascapular on the left (do not place over large bones—spine or scapula). Connect QuikCombo pads to therapy cable.
    - In patients with implanted devices (i.e., pacemaker, AICD), the QuikCombo pads should be placed away from the implanted device in one of the two standard positions.

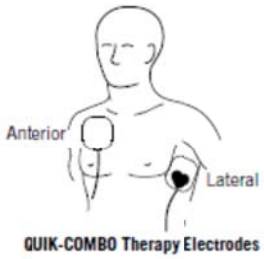


Figure 5-1 Anterior-Lateral Placement

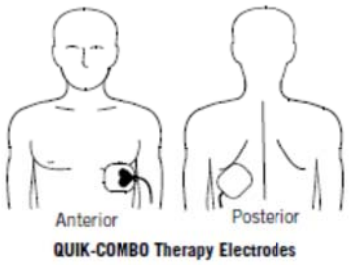


Figure 5-2 Anterior-Posterior Placement

- Press PACER
- Evaluate patient's ECG rhythm. Adjust ECG size if necessary to sense patient's native beats, adjust until proper sensing is indicated by a triangle ▼ marker in the middle of each native QRS.
- Press RATE or rotate the SPEED DIAL to select the initial pacing rate of 60 bpm, which is permitted by standing order.
- Press CURRENT or rotate the SPEED DIAL to increase current until electrical capture occurs.
    - The CURRENT and RATE buttons increase current in 10 milliamp increments, the SPEED DIAL increases in 5 milliamp increments.
    - Electrical capture is indicated by a wide QRS complex following the pace marker spike.

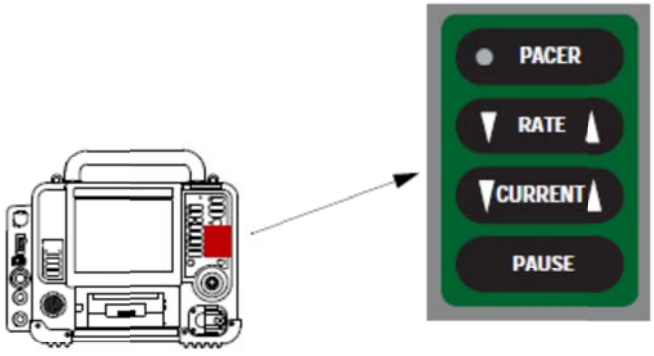


Figure 3-3 Area 2 Controls

Table 3-2 Area 2 Controls

CONTROL	DESCRIPTION
PACER	Activates pacer function. LED illuminated when function is activated and flashes with each current pulse.
RATE	Increases or decreases pacing rate
CURRENT	Increases or decreases pacing current
PAUSE	Temporarily slows pacing rate

- Evaluate patient's pulse quality and rate to assess for mechanical capture. Do not be surprised if you need to continue to increase the current a little past the point where you note electrical capture to have consistent mechanical capture.
- Once you determine you have consistent mechanical capture, reassess patient vital signs and need for sedation / analgesia. If patient has mechanical capture and vital signs do

not improve or severe symptoms do not resolve, call for medical control orders for potential increase in rate to 70 or more.

- To evaluate patient's underlying native rhythm at any point during pacing, press and hold PAUSE. This decreases the pacing rate to ¼ of the set rate. Releasing PAUSE restarts pacing at the prior rate and current settings.
- To completely stop pacing, either press PACER or reduce current to zero.

Documentation

See **PATIENT CARE DOCUMENTATION (P-2)**, Procedure Documentation section

Considerations

- Alert patients should be counseled on what pacing entails (including likely discomfort / pain). Sedation and/or analgesia should always be considered before initiation of TCP. If not provided prior to initiation, patient should be reassessed and provided needed sedation / analgesia during TCP. Patients with more chest wall muscle mass tend to have increased discomfort due to pacing.
- Patients who have had heart transplant have had an effective vagotomy (abolition of vagal nerve function on heart), so have baseline tachycardia and no route of action of atropine on cardiac rhythm.
- Monitor nuances:
    - LP 15 should generally be used in demand mode, which inhibits pacing output when it senses the patient's native beats / QRS complexes. To do so correctly, the ECG leads need to remain in place, and ECG SIZE needs to be set sufficiently high for the native beats to be sensed.
    - LP15 will show dashes in heart rate area on home screen if pacing is active. As a result, heart rate alarms are disabled.
    - LP15 has an internal pacemaker detection feature which uses lead V4 (alternatively V2). Internal pacemaker detection can be turned ON using OPTIONS / PACING / INTERNAL PACER, and will show a hollow arrow on the printed ECG to show internal pacemaker impulses. Note that if there is ECG artifact, it may mimic internal pacemaker pulses and falsely annotate the ECG. In that case, detection should be turned OFF. Very large or small amplitude pacemaker pulses may also impair counting.
    - If sync cardioversion becomes necessary while PACER is on, PACER must be turned off first so SYNC can be activated.
    - Radios placed too close to LP15 may interfere with pacing function.

Rationale: To provide instruction on indications for and method to utilize DuoDote Auto-injectors. Because time is of the essence in organophosphate toxicity, ability to self-administer this medication is important for responders.

- The DuoDote™ auto- injector contains 2.1 mg atropine and 600 mg pralidoxime chloride.

Background:

Organophosphate chemical nerve agents (CNAs) have been used successfully in terrorist attacks, and can be highly lethal. In addition, organophosphates in the form of pesticides are used in both household and industrial applications that put both citizens and providers at risk.

Indications:

- Organophosphate insecticide poisoning
- Nerve agent poisoning

Signs/Symptoms of exposure

Decontamination should be done as quickly as possible to prevent contamination of other providers and/or equipment.

Mild symptoms	**Severe symptoms**
Blurred vision, miosis (constricted pupils)	Strange or confused behavior
"Wet" • Excessive, unexplained teary eyes • Excessive, unexplained runny nose • Increased salivation such as sudden drooling • Increased airway secretions	Involuntary urination and defecation
Tachycardia or bradycardia	Loss of consciousness
Unexplained wheezing or coughing	Respiratory arrest
Chest tightness or difficulty breathing	Severe difficulty breathing or copious secretions from lungs/airway
Tremors throughout the body or muscular twitching	Convulsions, or severe muscular twitching and general weakness
Nausea and/or vomiting, acute onset of stomach cramps	

OBSERVE	**DUMBELS**
O – Others affected suddenly	D – Diarrhea
B – Body tremors/twitching	U – Urination
S – Salivation	M – Miosis (constricted pupils), muscle spasm
E – Eye tearing	B – Bradycardia, bronchospasm, bronchorrhea
R – Restricted Breathing	E – Emesis
V – Vomiting	L – Lacrimation
E – Excessive sweating	S – Salivation, seizures, secretions, sweating

Necessary Equipment

- DuoDote™ auto-injector

Necessary Monitoring

The patient with severe symptoms should receive critical care level monitoring, including cardiac rhythm monitor, frequent vital signs. In a nonaccidental release, this may not be immediately possible. Critical monitoring should be instituted as soon as possible.

Dosing

- For **MILD** symptoms of organophosphate poisoning:
  - FIRST DOSE – in the situation of known or suspected organophosphate poisoning, administer one DuoDote™ injection to the mid-outer thigh if the patient experiences two or more MILD symptoms of nerve gas or insecticide exposure.
  - EMS with mild symptoms may self-administer a single dose of DuoDote™.
  - Wait 10-15 minutes for DuoDote™ to take effect. If, after 10-15 minutes, the patient does not develop any SEVERE symptoms, no additional DuoDote™ injections are recommended, but definitive medical care should be sought.
  - For EMS personnel who have self-administered DuoDote™, an individual decision will need to be made to determine their capacity to continue to provide emergency care to others.
  - ADDITIONAL DOSES: If, at any time after the first dose, the patient develops any SEVERE symptoms, administer two additional DuoDote™ injections in rapid succession, and immediately seek definitive medical care.

- For **SEVERE** symptoms of organophosphate poisoning:
  - If a patient has any **SEVERE** symptoms of organphosphate poisoning, immediately administer **three** DuoDote™ injections into the patient's mid-outer thigh in rapid succession, and immediately seek definitive medical care.
  - **No more than 3 doses of DuoDote™ should be administered without a physician order**. (Limit of 3 doses is specific to the pralidoxime component of DuoDote™).

Procedure:

BEFORE INJECTING

- Tear open plastic pouch at any of the notches.
- Remove DuoDote™ auto injector.
- Place DuoDote™ in your dominant hand and firmly grasp it with the Green Tip pointing downward.
- With your other hand, pull off the Gray Safety Release, taking care never to touch the Green Tip.
- Keep fingers clear of both ends of the auto-injector.

SELECT SITE AND INJECT

- Injection site is mid-outer thigh. You can inject thru clothing, but make sure pocket is empty.
- Swing and firmly push Green Tip straight against mid-outer thigh, continuing to push firmly until you feel the auto-injector trigger.
- After the DuoDote™ auto-injector triggers, hold it firmly in place against the injection site for 10 seconds.

AFTER INJECTING

- Remove the DuoDote™ auto-injector from thigh and inspect the Green Tip; if the needle is visible, then the injection was successful.
- If the needle is not visible, make sure the Gray Safety Release is removed and repeat the preceding injection steps.
- Push the exposed needle against a hard surface until it bends back, then put the used auto-injector back in the plastic pouch.
- Keep used auto-injectors(s) with the patient so other medical personnel will be aware of how many injections were administered.
- Ensure proper decontamination is completed.

Considerations

- An anticonvulsant may also be administered to treat convulsions in the unconscious individual in keeping with **SEIZURE Protocol (M – 4)**. The effects of nerve agents and some insecticides can mask the motor signs of a seizure.
- In the presence of life-threatening poisoning by organophosphate nerve agents or insecticides, there are no absolute contraindications to the use of the DuoDote™ auto-injector. When symptoms of poisoning are not severe, DuoDote™ auto-injector should be used with extreme caution in people with heart disease, arrhythmias, recent myocardial infarction, severe narrow angle glaucoma, pyloric stenosis, prostatic hypertrophy, significant renal insufficiency, chronic pulmonary disease, or hypersensitivity to any component of the product.
- The patient MUST be decontaminated prior to being placed in the ambulance and transported, preferably before contact with EMS providers. Since the medication is an auto-injector, depending on the situation, the patient may be able to be coached to self-administer if there is significant risk to the EMS provider in direct patient contact.
- It is critical that these patients only be taken to a either Via Christi St Francis or Wesley, and that the facility be alerted as soon as possible, because a severe organophosphate toxicity patient will require huge doses of atropine which are not normally immediately available.

http://www.allmed.net/images/mngd/catalog/meds_iv_s/pharmaceuticals/dey_labs/duodote/Duodote.pdf

LUCAS MECHANICAL CPR P – 37

PROCEDURE Effective 12-1-2014

Rationale: To provide guidance and perspective on how the LUCAS™ Mechanical CPR device will be integrated into our Pit Crew model.

Background: Our pit crew cardiac arrest process has been very successful in producing improved patient outcomes in our system. While we do not wish to tamper with what is clearly a successful model, safety of providers is also a high priority, as is availability of first response resources within their service area. Sedgwick County EMS has purchased several LUCAS™ mechanical CPR devices which will be carried on Division Leader vehicles. There are some limitations to the LUCAS™ devices, including patient size and inability to modify compression rate. Studies in other systems have shown that these devices can produce acceptable compression ratios but rates that are slightly below the target of 100-120 compressions / minute including pauses. Our human pit crews routinely give our patients ideal compression rates, as well as acceptable compression ratios. As a result, LUCAS™ use should be limited to patients who meet indications below who are transported, either post-ROSC or in ongoing arrest. Our standard pit crew approach should continue to be used on scene. Division Leader will be responsible for correct placement and ongoing operation of LUCAS™ device.

Indications:

- Post-ROSC patients
- Ongoing arrest patients who are being transported, either trauma or medical
- Patient size appropriate for machine (see below for contraindications). Approximate guidelines include:
  - Sternum height of 6.7 – 11.9 inches
  - Chest width of < 17.7 inches
  - The device may be used in pediatric patients if the patient is not too small as noted in the contraindications section.

Contraindications:

- Pregnancy
- Patient body size incorrect:
  - Too small: LUCAS™ alerts with 3 fast signals when lowering suction cup, you cannot enter **PAUSE** or **ACTIVE** mode, signals patient is too small for correct placement
  - Too large: upper part and legs cannot be locked to the back plate without compressing patient
- LUCAS™ is not to be applied unless the patient is being transported in cardiac arrest or post-ROSC, and compressions are not to be activated unless patient is in cardiac arrest.

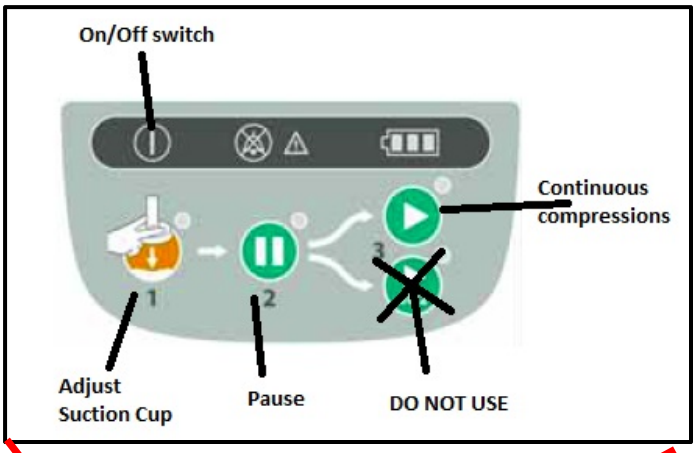
Necessary Equipment

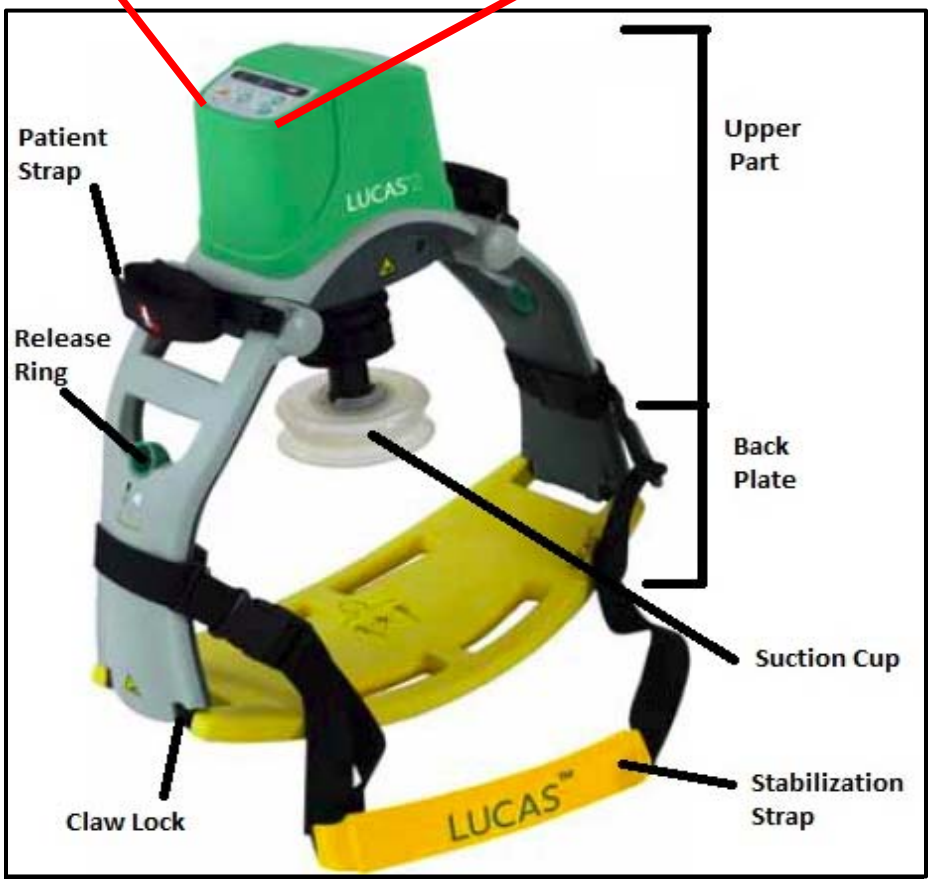
LUCAS™ Device
Spare battery for long transport
Backboard or soft patient mover to assist in moving patient once LUCAS™ is applied

Procedure:

- An SCEMS provider trained on the LUCAS™ must remain with the patient at all times until the LUCAS™ is removed. That person shall be responsible for the proper application of and operation of the device.
- Remove device from case. Push on/off button to power up and initiate self-test. Green LED next to ADJUST key will light when ready for use.

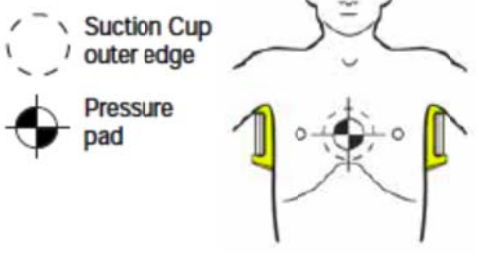
- The LUCAS™ 2 has push-button settings
  - **ADJUST** – for initial sizing to patient.
  - **PAUSE** – stops compressions if needed for rhythm check, repositioning the patient or changing batteries.
  - **ACTIVE** – compresses the chest at a rate of 100 compressions per minute. Select the **<u>continuous compressions button</u>** (top button).





- The LUCAS™ should <u>never</u> be paused for BVM ventilations or airway management.

- If patient has an invasive airway, position 3 is to anchor the airway, even if a holder is in place and support the patient's head throughout LUCAS™ application and patient movement.
- Be sure defib pads will not interfere with proper placement of suction cup. Suction cup cannot be on top defib pads. See **CARDIAC ARREST MANAGEMENT** (**P-30)** for placement options. Move defib pads if necessary.
- **In patients with ongoing cardiac arrest,** Pit Crew resuscitation should be in process. Division Leader directs application of the LUCAS™ over the course of two planned pauses between 220 compression cycles. The pause should still not be longer than the usual length of 15 metronome beeps. Maximizing compressions remains the priority.
    1. First pause: Division Leader directs placement of the LUCAS™ back plate with the assistance of the person who just finished compressions. The back plate can be placed in one of two ways:
        - Lift the patient's shoulders and slide plate in under patient's head until the top of the plate is below patient's armpits.
        - Roll the patient side to side and work the plate down behind patient.
    2. Resume manual compressions after no more than 15-beat pause.
    3. Prepare upper part of device by pulling up on both release rings on legs to assure that claw locks are open.
    4. Attach claw to back plate on side opposite to compressor while manual compressions continue.
    5. Pivot the machine's upper part over the patient's torso, bringing the top/hood carefully toward the manual compressor, threading it between his/her arms and stopping manual compressions only at the moment prior to locking the near side claw at the end of that compression cycle.
    6. Second pause:



        - Position the suction cup so that the lower edge is just proximal to the inferior sternum (see diagram). Be sure you are above the xiphoid process. Assure that defib pads and wires are not under or interfering with suction cup.
        - Adjust the suction cup height as follows: Press **ADJUST** button, push suction cup down with two fingers until pressure pad touches the patient's chest without compressing the chest.
        - Press **PAUSE** button to lock the start position. Then remove your fingers from the suction cup.
        - Verify that position on sternum is correct. If not, push **ADJUST** button, pull up suction cup, and repeat positioning as above.
        - Verify that the claws on the support legs lock without compressing the patient's chest. If the patient's chest is compressed, the patient is too large.
        - If LUCAS™ alerts with 3 fast signals when suction cup is lowered, the patient is too small.
        - If patient too large or small, remove device and restart manual compressions as soon as possible.
    7. Activate compressions by pushing **CONTINUOUS** button.

8. Secure patient's arms with Patient Straps on upper part of LUCAS™ unless a humeral IO has been placed. If humeral IO has been placed, secure wrists together over umbilicus or secure arm with IO under the buttock on that side to prevent IO dislodgement. Do not attempt to lift patient by Patient Straps.
9. Position patient on backboard or patient mover for movement to cot. Backboard may be left in place for patients in ongoing arrest. Other patients should be transferred to soft cot, ideally by removing backboard from the foot of the cot with appropriate securing of airway, patient, and LUCAS™.

- **In patients post-ROSC**: After transport decision has been made, and patient has had several minutes to begin equilibrating physiologically post-ROSC, gently place the LUCAS™ on the patient as follows: Division Leader directs placement of the LUCAS™ back plate in one of two ways:
  - Lift the patient's shoulders and slide plate in under patient's head until the top of the plate is below patient's armpits.
  - Roll the patient side to side and work the plate down behind patient.
- Continue with Steps 3-6, 8, and 9 above.
- If patient re-arrests, activate compressions by pushing **CONTINUOUS** button.

- If patient is moved with the device only, press **PAUSE** for the movement period, which should be as brief as possible. Re-verify correct suction cup position before restarting compressions. Assure that upper part of device is perpendicular to patient's chest.
- Be certain you change battery and recharge after every use so device is ready for next use.

Considerations

- Manpower for transport with LUCAS™
  - 2-3 providers is an appropriate number. If the patient re-arrests and the device does not function, two providers are enough to begin Pit Crew CPR as the driver calls for additional manpower.
  - One of the providers should be the Division Leader responsible for operating the device.
  - No more than 4 EMS providers should be in the rear of the ambulance for transport.
  - Division Leaders may choose to allow the ED to continue use of LUCAS™ for a brief period of time after ED arrival to allow safe removal of the device and an orderly transition to hospital care. The Division Leader will continue to be responsible for safe operation of the device.
- Operation/Placement:
  - Only use continuous compression mode, never 30:2 mode.
  - LUCAS™ compressions interfere with ECG analysis. Therefore, cardiac rhythm should only be evaluated between cycles when **PAUSE** is pushed.
  - If the pressure pad is incorrectly positioned in relation to the sternum, there is an increased risk of damage to the rib cage and the internal organs, and the cardiac output is further decreased.
  - If the position of the Suction Cup changes during operation or during defibrillation, immediately push **ADJUST** and adjust the position. Always use the LUCAS™ Stabilization Strap to help secure the correct position.
  - Cardiac output is further compromised if the pressure pad presses down too heavily or too lightly on the chest. Push the **ADJUST** key and adjust the height of the Suction Cup immediately.
  - If safe and correct positioning of the LUCAS™ on the patient's chest is not possible, start Pit Crew CPR again

- Troubleshooting:
    - Monitor for movement of the device, both the tower and the suction cup. The neck strap and wrist straps should be used and will help avoid this.
    - The upper part / tower must remain vertical relative to the patient's chest at all times. Reposition if the device goes off-axis. If there is a device malfunction, immediately remove the arm of the device and resume Pit Crew CPR. Consider reapplying device only after the problem has been addressed.
    - A red alarm LED will illuminate and a high priority alarm will sound if there is any malfunction during operation.
    - If there are interruptions, or the compressions are not sufficient, or something unusual occurs during operation: Push **ON/OFF** for 1 second to stop LUCAS™ and remove the device. Start manual chest compressions.
- Device cautions:
    - Use with caution in oxygen-enriched environment – use ventilation fan in rear of ambulance when LUCAS™ in use.
    - Do not block the vent holes under the hood since this can cause overheating. The temperatures of the hood and battery may rise above 118 °F / 48 °C. If hot, avoid prolonged contact to prevent skin burns.
    - Do not use the straps for lifting. The straps are only to fixate the patient to LUCAS™

Rationale: To provide guidance for when it is appropriate to obtain vascular access in patients, in what order different options should be considered, and a link to the ability to provide fluid resuscitation if indicated.

Indications: Vascular access is indicated for patients who are likely to need intravenous access for medication or fluid administration either during EMS transport or shortly following arrival in the emergency department. Some medications are available for IN or PO administration—if only a single dose of medication is needed and the patient is hemodynamically stable, vascular access may not be needed during the EMS care interval (i.e. fentanyl, prednisone).

1. Peripheral IV (PIV)
    a. Indicated in patients for most medications.
    b. In the majority of patients, a saline lock will be adequate
        i. If IV fluids are needed, they can be provided via the saline lock
    c. Trauma patients should generally have a flowing line started
2. External jugular IV (EJIV)
    a. Permissible in patients with lack of peripheral IV access sites who require fluid or medication administration. Providers must be trained in EJIV placement.
    b. EJIV should not be initiated for saline lock alone.
    c. Should RARELY be used. Intraosseous is preferred.
    d. EJIV should not be started in cardiac arrest because it will interfere with the BLS Triangle.
3. Intraosseous access (IO)
    a. Indicated for code red or blue patients in whom IV access is essential to patient care for either medication or fluid administration and in whom peripheral access cannot be obtained in a timely manner.
    b. PIV does not necessarily need to be attempted prior to IO.
    c. See **INTRAOSSEOUS ACCESS Procedure (P-41)** for specifics.

Contraindications/ Precautions:

Contraindicated: Infection at planned venipuncture site
Precaution (avoid unless absolutely necessary): skin breakdown, burns at or near site of venipuncture, scars / evidence of prior surgery at venipuncture site.

Necessary Equipment

IV catheter
Antiseptic cleanser (i.e. alcohol wipes)
Saline lock or IV fluid bag + set
IV site dressing / tape

Necessary Monitoring

IV site should be intermittently monitored for evidence of infiltration. This is

especially true before administering medications noted in the formulary to cause tissue necrosis when they extravasate.

Procedure:

- Using aseptic technique, prepare either:
  - saline lock by flushing all air from line with 2-3 ml saline flush.
  - IV fluid bag setup for patients who need a running line or fluid boluses. Fluid should be checked as every other medication for expiration date, cloudiness, leaks, presence of particles.
  - Generally a 60gtt/minute set should be used for medical patients, 10 gtt/minute set for trauma patients and medical patients with a significant volume deficit (i.e. GI bleed, sepsis).
- Locate appropriate venipuncture site
- Prepare area with aseptic technique
- Place appropriate sized intravenous catheter:
  - Pediatrics 20-24ga
  - Adult medical 18-20ga
  - Adult trauma 16-18ga
- Peripheral IV:
  - Place venous constricting band above site
  - Prepare area with aseptic technique (alcohol prep or chlorhexidine)
  - Insert appropriate sized intravenous catheter, bevel up, until pop and/or blood flash noted.
- External jugular IV:
  - Place patient supine, head down if possible, to promote neck vein distention
  - In patient without suspected C-spine injury, turn patient's head away from the planned EJ access site
  - Prepare area with aseptic technique (alcohol prep or chlorhexidine)
  - Occlude the vein distally just above the clavicle
  - Insert appropriate sized intravenous catheter, bevel up until pop and/or blood flash noted. Enter vein approximately halfway between angle of the jaw and the clavicle
- Advance catheter. Never reinsert needle through catheter. Dispose of needle in sharpsafe.
- Attach IV fluid line or saline lock and flush line, evaluate for any evidence of extravasation. If extravasation, remove IV catheter.
- Cover with IV dressing, label with date, time, catheter gauge. For EJIV, it can be helpful to loop the IV tubing over the ear to better secure the line. Cervical collars should not be used in conjunction with EJIV.
- See **FLUID RESUSCITATION Procedure (P – 42)** for guidance on IV fluid resuscitation.

Special Situations: Paramedic only

- Indwelling vascular catheters (i.e., dialysis fistula, PICC line, Groshong catheter) may be used by standing order in patients in cardiac arrest. IO insertion is preferred if possible. Medical direction should be contacted for orders in other patients. Use of subcutaneous accesses (i.e. chemotherapy ports accessed with specialized needles) is not permitted under any circumstance.
- For dialysis patients who cannot have another peripheral or IO access placed promptly, the internal renal dialysis fistula may be accessed using standard IV needles and the technique described for Peripheral IV insertion above. Extra care should be taken with aseptic technique in such patients.
- For cardiac arrest or code red patients who cannot have another peripheral or IO access placed promptly, existing temporary central venous access with existing external ports (i.e. Groshong catheter, PICC line) may be accessed.
- Access procedure: use strict aseptic technique
    - Wipe ports with alcohol wipes
    - Access blue (venous) port if more than one port exists. Retain port cover with patient.
    - Assure that line is clamped with an existing inline clamp before accessing
    - Attach empty 10cc syringe to port, unclamp, withdraw 5-7 cc fluid. This will withdraw any heparin that may be instilled in the line that should not be given to the patient.
        - If line draws well, reclamp line.
        - If line does not draw well, reattach port cover and do not use line.
    - Attach IV fluid line, unclamp and begin fluid / medication administration.

Documentation

See **PATIENT CARE DOCUMENTATION (P-2)**, Advanced Vascular Access Documentation section

Considerations

In a critical patient where peripheral IV access is unsuccessful, IO should be considered for a single vascular access as noted in the **INTRAOSSEOUS ACCESS Procedure (P-41)**

When possible, blood from venipuncture should be used for blood glucose checks rather than subjecting patient to an additional puncture.

For pediatric code red patients, IO access should be considered after no more than 2 minutes of PIV attempts.

PIV attempts are not required before IO placement in the critical patient.

EJIV is being deemphasized due to difficulty in maintaining and visualizing line, intraosseous is far preferred to EJIV.

EJIV should not be attempted in patients with scar on the neck consistent with prior carotid endarterectomy due to distortion of anatomy by prior surgery.

Rationale:
In the most seriously ill or injured patients, establishing traditional venous access can be difficult, or too time consuming in a critical patient. In those situations, the intraosseous space provides fast and safe vascular access for administration of medications and fluids.

Indications: For adults and pediatrics anytime that vascular access cannot be obtained in a timely manner in code red or blue patients, and other routes of medication administration that are less invasive (i.e. IM, IV, IN) are not an option or take too long to meet the patient's needs.

Contraindications:

Fracture of the long bone (humerus or tibia) of the intended insertion bone.
Orthopedic hardware near insertion site, i.e. humeral head or knee replacement
Pre-existing bony pathology: osteogenesis imperfecta, severe osteoporosis
Infection of skin or bone at insertion site, i.e. cellulitis or osteomyelitis
Inability to locate landmarks
Previous intraosseous attempt within 24 hours in the intended insertion bone

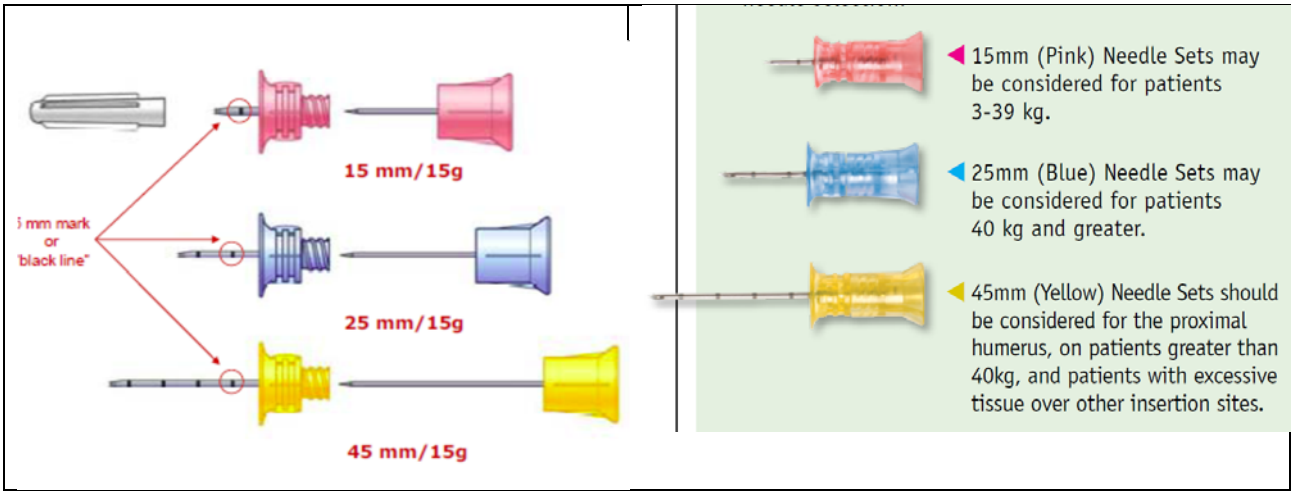
Necessary Equipment

EZ IO Driver
EZ IO Needles (45mm, 25mm, 15mm)
Antiseptic cleanser (i.e. alcohol wipes or chlorhexidine)
EZ Connect Extension Set
Saline Flush
EZ IO wristband
IV fluid and tubing
Pressure Bag
2% Lidocaine (preservative-free) for infusion pain

Procedure:

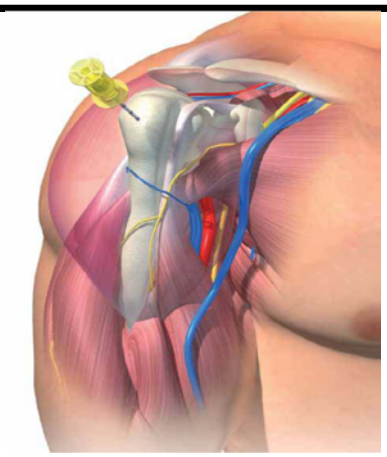
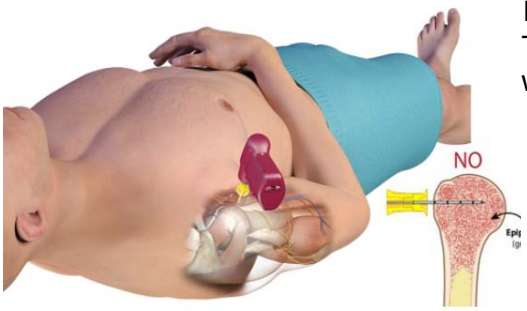
- Using aseptic technique, prepare the following:
  - IV fluid bag set up with appropriate drip set
  - Perform MACC check on syringe with appropriate initial anesthetic dose of lidocaine.
    - Adult dose: 40 mg IO.
    - Pediatric dose: 0.5 mg/kg (MAX 20 mg) IO.
  - Flush all air from EZ Connect extension using either lidocaine or normal saline . In conscious or semiconscious patients who can be anticipated to have pain with intraosseous infusion, it is preferable to flush the extension with 2% lidocaine. In cardiac arrest, you may use either lidocaine or normal saline.
- Locate landmarks for the appropriate insertion site (see below):
  - Pediatric: The proximal tibial site will be used.
  - Adult: The proximal humerus is preferred over the proximal tibia due to significantly quicker uptake and better flow rates, but either site may be used.
- Choose appropriately sized needle after evaluating soft tissue depth at selected site. If in doubt, use larger needle, as you can control depth during insertion. Needles are no longer "pink = peds", rather, you should evaluate soft tissue depth and use the proper sized needle as below.

- 15mm (pink): for patients 3-39 kg
- 25mm (blue): for patients over 3 kg, this will work for peds and for smaller adults at proximal tibial site
- 45mm (yellow): for proximal humerus insertion site, excess tissue, 40+ kg
- Verify that both parts of the needle are together: the external cannula and the internal needle with the sharp drill end



- Identify insertion site:
  - Proximal humerus (adult only):
    - Use 45 mm needle
    - Insertion site is on the anterolateral side of the greater tubercle of the humerus. This can be identified by first internally rotating the humerus by either:
      - Adducting shoulder and flexing elbow (place arm next to side and patient's hand over umbilicus) OR
      - Hyperpronating forearm with arm straight ("thumb to the bum")-- put hand under buttock with thumb to the midline

	Place one hand in the axillary fold parallel to the trunk to protect the brachial plexus, place the other hand perpendicularly in the midline of the upper arm. Where the thumbs come together is the line where the surgical neck of the humerus can be found. Slide the thumbs up from the distal part of the humerus until you hit the bump that is the base of the greater tubercle. It is also described as feeling like where a golf ball meets a tee. The insertion site is about 1 cm (less than one fingerbreadth) above this. Mark site by indenting with the plastic needle cover.

	Needle should be inserted at about a 45 degree angle to the head of the humerus in a plane perpendicular to the skin. This can best be accomplished from next to patient's head, as you will be aiming in the general direction of the xiphoid process, NOT toward the upper chest. Assure arm remains properly positioned for insertion.
	Insert needle at selected site at a 45 degree angle. This means your needle driver will be in a general plane with the xiphoid process, angled postero-medially.

- <u>Proximal tibia site</u> (adult or pediatric):
  - The proximal tibia insertion site is approximately 2 cm (a little over one fingerbreadth) below the patella and approximately 2 cm medial to the tibial tuberosity. Remember; "Big Toe IO" means to look on the big toe side of the leg for the tibial plateau (the flat spot). Take care not to choose a site that is too distal or you will risk penetrating both sides of the bone and not having a usable line.
  - Mark selected insertion site by indenting with plastic needle cover.

<u>After site selection and marking:</u>

- Prepare insertion site with aseptic technique
- Attach selected needle to driver, confirm that both needle and inner cannula (which is removed after insertion) are attached to driver, remove plastic safety cap
- Stabilize selected bone between thumb and forefinger and insert needle at 90° to limb until needle touches the bone. BEFORE activating the trigger, check that at least one black line is visible on needle set outside the skin when needle touches bone—otherwise

the needle is not long enough to seat properly in the medullary cavity. Should this occur, choose another site or a larger needle BEFORE drilling.

- Penetrate the bone by squeezing the driver's trigger and apply gentle consistent downward pressure allowing the driver to do the work. When you feel a decrease in resistance indicating the needle has entered the medullary space, release the trigger.
- Assure that needle is seated firmly in bone.
- Remove EZ IO Driver from needle set while stabilizing catheter hub
- Remove stylet from needle set by turning counterclockwise and dispose of in NeedleVise sharps block
- Attach EZ Stabilizer
- Attach primed EZ Connect extension with attached flush
- Confirm placement with flush (lidocaine or normal saline). Particularly in pediatrics or with insertions where there is needle visible above the skin, vigorous flushing may cause needle to displace, so SLOW flush is important both to limit pain and to maintain placement.
- In conscious or semi-conscious patients (A-V-P on AVPU scale), administer lidocaine 2% prior to starting infusion as per **PAIN MANAGEMENT Protocol (M-8), LIDOCAINE Formulary (F-20).**
    - Give what is left of initial lidocaine dose after you primed the line
    - Adult dose: 40 mg IO slowly over 2 minutes wait 1 minute to allow anesthesia to develop, flush with 5-10 ml saline, then give another 20 mg IO slowly over 1 minute.
    - Pediatric dose: 0.5 mg/kg (MAX 20 mg) IO slowly over 2 minutes, wait 1 minute to allow anesthesia to develop, flush with 2-5 ml saline, then give another 0.25 mg/kg (MAX 10 mg) IO slowly over 1 minute.
    - Third dose of lidocaine may be repeated in 10 minutes if needed (adult = 20mg, pediatric = 0.25 mg/kg), or additional pain control measures per **PAIN MANAGEMENT Protocol (M-8)** may be administered.
- Attach IV line, begin infusion as indicated in **FLUID RESUSCITATION (P-42)**, apply pressure bag to IV fluid bag if necessary. Particularly with tibial insertion, pressure bag will likely be needed.
- Secure device and tubing, avoid rocking and inadvertently removing EZ IO needle
- If medication is given through intraosseous line, each medication should be flushed with 3-5ml of fluid.
- Monitor IO catheter and site closely for complications, particularly extravasation.
- IO placement should be protected in a similar manner to how invasive airways are protected.
- Place EZIO wristband on patient
- Assure that staff is advised of IO placement and site and that site has been verified to have no extravasation at the time of patient turnover. Include this in your documentation.

Documentation

See **PATIENT CARE DOCUMENTATION (P-2)**, Advanced Vascular Access Documentation section

Considerations

- PIV does not need to be attempted prior to IO in a critical patient.

- EZIO should have at least a KVO flowing line. It should not have a saline lock.
- For pediatric code red patients, IO access should be considered after no more than 2 minutes of PIV attempts.
- Intraosseous access should not be used:
    - For quickly reversible problems (such as hypoglycemia) unless other methods are unsuccessful (i.e. IM glucagon)
    - When other medication administration routes are equally effective and/or rapid and less invasive (i.e. IM or IN)
- Femur fracture is not a contraindication to tibial insertion, but humeral insertion would be preferred due to ability to infuse greater volume and reach the central circulation more quickly.
- For patients with proximal humerus placement, care should be taken to limit arm movement and exercise additional caution in preventing dislodgement. Arm must be maintained / secured with shoulder adducted and forearm hyperpronated or elbow flexed with hand over umbilicus throughout EMS care and transfer.
- Once placed in bone, IO catheters should not be removed by EMS. If for some reason an IO catheter is felt to be ineffective (i.e. won't flow/flush, extravasation) and will not be used, a saline lock hub may be placed to keep the catheter sterile.
- Any IV medication in the W-SC EMSS formulary may be given via the IO route.

Rationale: To provide guidance for when and how fluid resuscitation should be given to patients. It is permissible within the **VASCULAR ACCESS Procedure (P – 40)** to initiate IV fluids at KVO (Keep Vein Open) rate. This Procedure addresses providing fluid resuscitation.

Indications: Fluid resuscitation is indicated for patients who have signs and symptoms of poor perfusion. Signs and symptoms of dehydration or poor perfusion may include the following:

1. Adults:
    a. Tachycardia due to volume depletion
    b. Hypotension, relative hypotension, or widened pulse pressure suspected due to hypovolemia
    c. Obvious source of significant blood volume loss (i.e. traumatic hemorrhage, verified significant GI blood loss)
2. Pediatrics:
    a. Decreased capillary refill (> 3-4 seconds)
    b. SBP < 70 + (age in years x 2)

The indication for fluid resuscitation should be clear from the patient care documentation.

Contraindications/ Precautions:

Precaution (avoid unless absolutely necessary): patient with pulmonary fluid overload, history of congestive heart failure or myocardial dysfunction

Necessary Equipment

IV fluid

- A 60gtt/minute set should be used for most medical patients
- A 10 gtt/minute set for trauma patients and medical patients with a significant volume deficit (i.e. GI bleed, sepsis).

Sticker on bag if any additives or if chilled fluid

Necessary Monitoring

Monitor rate of fluid infusion intermittently to assure it infuses at the planned rate and does not extravasate into the tissue.

Reassess and document pulse, blood pressure, capillary refill as appropriate to monitor response to fluid therapy.

Procedure:

IV fluid should be checked for expiration date, cloudiness, leaks, presence of particles.

IV fluid bag should be marked with start time

Any medication added to an IV fluid bag should be specified on the bag on an IV sticker using the "MEDICATION DRIP" or "EPINEPHRINE DRIP" stickers

Chilled fluid should be clearly marked with blue "CHILLED SALINE" stickers so the ED staff is aware that this intervention has been started.

Adults:

- Atraumatic cardiac arrest: Administer a chilled normal saline bolus of 2L as quickly as possible (with pressure bag when available). The bolus may be started intra-arrest. Otherwise, it should be started as soon as practical after ROSC for patients who are unable to follow commands. See **POST RESUSCITATION CARE Protocol (MC – 6).**
- Administer 1-2 liter normal saline bolus for patient meeting the indications for fluid resuscitation above at provider discretion.
    - For patients with history of cardiac dysfunction or CHF, bolus may be given in 250-500 cc increments at provider discretion.

Pediatrics:

- Administer 20 cc/kg normal saline fluid bolus for patient meeting the indications for fluid resuscitation above at provider discretion.
- Pediatric patients should not receive chilled IV fluids unless specifically directed by medical command.

Repeat boluses require medical command orders.

Considerations

Chilled IV fluid is reserved for adult patients either intra-arrest or post-ROSC, or with hyperthermia as specified in **POST RESUSCITATION CARE Protocol (MC – 6)** and **ENVIRONMENTAL EMERGENCIES Protocol (M – 7)**

Warmed IV fluid should be strongly considered for trauma patients when the ambient air temperature is less than 60 degrees, in hypothermic patients, and is an option for all patients at provider discretion.

MEDICATION ADMINISTRATION CROSS CHECK (MACC) P - 43

PROCEDURE Effective 02-10-2012

Rationale: To provide a specific method to check medications before administration to improve safety of medication administration by confirming critical information with a second provider prior to the medication being administered. The MACC emphasizes that delivering the wrong medication fast is unhelpful, while slowing down to administer the right medication correctly is in the best interest of our patients' health and safety.

Indications:

- The Medication Administration Cross Check (MACC) is to be used EVERY time a medication is administered by any route (PO, IV, IM, IO, SL, SQ, Inhaled, etc).

Background:

Medication errors are a significant patient safety concern. Every effort should be made to avoid medication errors. A structured cross check approach has been shown to reduce errors in the hospital environment, and is expected to have the same effect in the EMS environment.

Necessary Equipment

- Medication must be prepared for administration prior to initiation of the MACC.

Necessary Monitoring

For the MACC to be successful, it is critical that both providers be fully attentive and engaged in the process.

Procedure:

This will be done out loud in collaboration with another provider, using the procedure as listed.

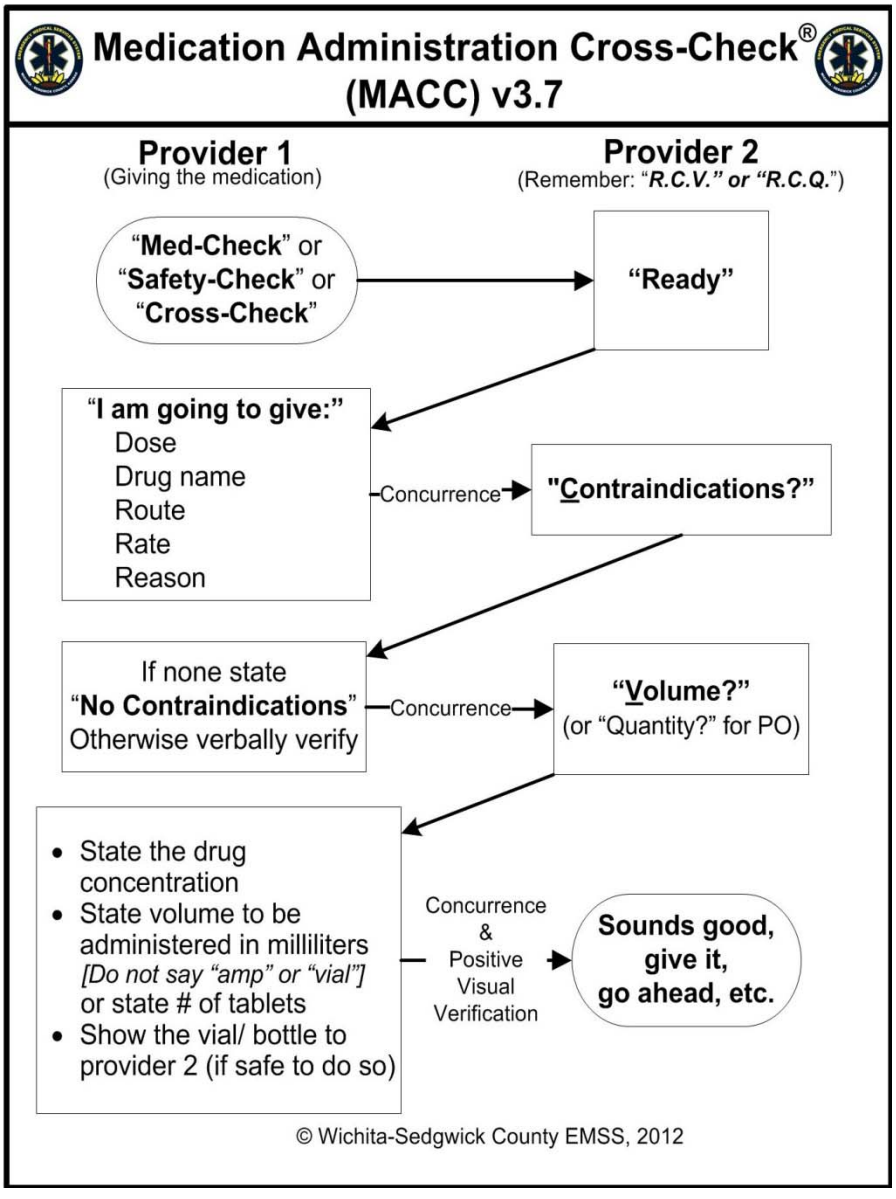
Prior to administration of any medication, immediately following the preparation of the medication, the provider responsible to administer the medication will initiate the MACC.

It is appropriate to advise the patient of what is being done by letting them know that you will be doing a medication safety check with your partner to ensure they are getting the right type and amount of medication.

MACC should be performed in partnership with the most highly qualified level of provider available in the following order of preference:
1) Credentialed Paramedic, 2) Paramedic, 3) Credentialed AEMT, 4) AEMT, 5) EMT

1. Once the medication is prepared for administration, Provider 1 initiates procedure by stating one of the following phrases: **"cross check," "med check," or "safety-check"**
2. Provider 2 responds that he or she is **"ready."** This lets provider 1 know you are fully engaged.
3. Provider 1 states the phrase **"I am going to give"** and provides the following information: the **dose, drug name, route, rate, and reason**. Examples:
    a. "I am going to give 75 mcg fentanyl IV slow push for pain."
    b. "I am going to give 324 mg aspirin chewed orally for ACS."
4. If Provider 2 agrees, he or she responds with the question **"contraindications?"**

5. Provider 1 must check the expiration date on the bottle/vial, verify vital signs are appropriate for medication administration, and any drug allergies if not already done. Provider 1 should respond either by saying "no contraindications" or by stating any relative contraindications present.
6. If Provider 2 concurs, he or she responds with the question **"volume?"** or **"quantity?"**
7. Provider 1 should state the **drug concentration and the volume** they plan to deliver, and should show the vial to Provider 2 if it is safe to do so (i.e., the other provider is not driving). It is optional to repeat the dose here. Examples:
    a. Fentanyl 100 mcg in 2 ml, giving 1.5 ml for a total of 75 mcg.
    b. Aspirin 81 mg tablet, giving 4 tablets for a total of 324 mg.
8. If Provider 2 agrees and makes a positive visual verification, he or she should respond with a phrase such as **"I agree,"** or "sounds good," and the order to **"give it."** Avoid ambiguous terms such as "okay."



Considerations

- "Contraindications" include but are not limited to - verification of appropriate vital signs, known patient allergies, and expiration date.
- If a discrepancy, disagreement, or need for clarification is encountered at any step in the process, it must be resolved prior to continuing the cross check.
- Only Provider 2 can authorize administration of the medication.
- If there is an interruption or change in patient condition of any kind, the process must be re-initiated by Provider 1.

Red Flags

Red flags are signs that you or someone on your team has lost situational awareness and verification is needed.

- Intuition or a "bad gut feeling"
- Rushing
- Poor Communication
- Disagreement
- Task Saturation
- Trying something new under pressure
- Interruptions
- Ambiguity
- Preoccupation
- Confusion

When a red flag situation occurs, STOP AND VERIFY

- Establish a collective awareness by reviewing the situation out loud using SBAR
  S – Situation
  B – Background
  A – Assessment
  R – Recommendation
- Defer to expertise
- Look it up (protocols, SOP)
- Contact the Medical Director

NASAL MEDICATION ADMINISTRATION P - 44

PROCEDURE Effective 7-1-2012

Rationale: To provide guidance for use of intranasal (IN) medication administration.

Indications: Nasal medication administration is indicated for several types of patients:

- need for rapid medication administration (i.e. status epilepticus, unstable patient sedation / analgesia before cardioversion)
- single isolated need for medication during EMS care interval (i.e. naloxone, single dose of fentanyl for pain)
- altered patients where needles for IV or IM medication present a significant potential danger to providers

Contraindications/ Precautions:

Contraindicated: Known nasal mucosal abnormalities (i.e. destruction due to cocaine abuse)

Precaution (avoid unless absolutely necessary): biting patients

Necessary Equipment

MAD device

Syringe (1-3 ml, based on dose to be administered)

Medication to be administered

Necessary Monitoring

Monitoring is based on the medication administered and described in the Formulary.

Procedure:

- Draw up medication, assemble medication-filled syringe with MAD device
- Wipe mucus from nose if needed
- Administer approximately ½ of medication volume into each nostril (MAX 1 ml/nostril)

Considerations

Intranasal medication administration offers a noninvasive and rapid way to provide pain relief or anxiolysis / sedation without intravenous access. This is particularly useful in pediatric patients, and may facilitate IV access later if needed.

Medication is absorbed nasally via the nasal mucosa. Mucosal absorption is not possible when there are significant nasal secretions, vasoconstriction in the mucosa due to cocaine use, or destruction of the mucosa due to cocaine use.

A volume of 0.3-0.5 ml per nostril is ideal. Otherwise the med runs off and is not absorbed. Maximum volume administration is 1 ml/nostril.

MAD device creates an atomized particle size of 10-50 microns, which adheres best to the nasal mucosa. Smaller particles are nebulized and go to the lungs, larger particles are droplets that run out of the nose.

For status epilepticus, IM or IN midazolam is preferred for the initial dose of medication. IN should not be used in a patient with large amount of nasal secretions. IN midazolam is more effective than rectal diazepam.

Allow a 10-15 minute interval between nasally administered medications to allow absorption of the first medication.

Medications for nasal administration:

Fentanyl

Glucagon

Midazolam (5 mg/ml)

Naloxone

DETERMINATION OF DEATH: TRAUMA P - 50

PROCEDURE Effective 11-1-2014

Rationale: To provide guidance on how death of a trauma patient will be determined and documented.

Indications: Trauma patients in whom EMS is determining death. Primarily applies to patients who are pulseless and apneic on EMS arrival and meet criteria for not attempting resuscitation (triage black) as well as those triaged blue at any point in whom resuscitation is unsuccessful and then are retriaged black. The initial 2 criteria for determining death are **pulselessness** and **apnea**.

Contraindications/ Precautions:

- Determination of death is contraindicated in patients who do not meet specific criteria as specified in **TRAUMA CEASE RESUSCITATION (T-3)**. For patients not meeting criteria in these two protocols, resuscitation is to continue until physician contact has been made and the physician has determined that resuscitation efforts should cease.

Necessary Equipment

Minimum: Stethoscope

Necessary Monitoring

For trauma patients triaged blue and resuscitation has been attempted:

- Cardiac monitor and recorded monitor strips that can be downloaded and appended to patient record

For patients who cannot be adequately accessed / assessed for signs of life or for resuscitative efforts as below due to entrapment, strongly consider placement of cardiac monitor to verify lack of cardiac activity before considering triage black.

Procedure:

- In patients with apparent death (suspected triage black), patients **must be pulseless and apneic.** Triage black without any resuscitative efforts is indicated for trauma patients with:
  - Decapitation: the complete severing of the head from the remainder of the patient's body
  - Decomposition or putrefaction: the skin is bloated or ruptured, with or without soft tissue sloughed off. The presence of at least one of these signs indicated death occurred at least 24 hours previously.
  - Transection of the torso: the body is completely cut across below the shoulders and above the hips through all major organs and vessels. The spinal column may or may not be severed.
  - Incineration: 90% of body surface area with full thickness burns as exhibited by ash rather than clothing and complete absence of body hair with charred skin. Determination of incineration requires being able to visualize the majority of the individual's body.
  - Rigor mortis: the body is rigid.
  - Submersion for > 30 minutes in an adult patient.

  - Injuries incompatible with life: massive crush injury, complete exsanguination, severe displacement of brain matter or gunshot wound that crosses midline.
- For patients not meeting triage black criteria, follow **CARDIAC ARREST MANAGEMENT Procedure (P-30)**
- Assure you have adequately been able to physically access and assess the patient to determine death, or have reasonable assurance of medical vs. trauma and a non-treatable cause of death (i.e. GSW or stabbing)
- Notify law enforcement of death.
- Treat deceased patients with respect. Cover the patient if appropriate, protect from unnecessary exposure without disturbing the body. The body should not be moved once death is determined without approval from LEO or coroner.

Documentation:

See **PATIENT CARE DOCUMENTATION Procedure (P-2)**

Considerations

- For traumatic deaths, it is highly likely that death is not of natural causes (i.e., homicide, suicide, fire), and great care should be taken to preserve the scene for law enforcement assessment or coroner assessment once the patient has been determined to be dead in keeping with protocol and this procedure.
- Dependent lividity has been REMOVED as a criterion for death alone as it does not apply to victims of lightning strikes, drowning, or hypothermia.
- As noted in **TRIAGE COLOR CODES Protocol (A-4)**, deceased patients will not be transported by EMS. If extenuating circumstances potentially exist that may warrant movement of a patient who has been declared dead (triage black), this should be discussed beforehand and agreement between the Division Leader, the appropriate law enforcement authority, and ideally the EMSS Medical Director to assure that evidence is not destroyed, the deceased is not moved between jurisdictions, etc.
- Once death is declared, the EMS role is over. The scene should be preserved for law enforcement and the medical examiner until it is determined that it is not a medical examiner's case or a crime scene.
  - The body should not be moved, nor should any of the surroundings be changed / moved / disturbed for any reason (this includes moving / gathering medications, finding ID, etc).
  - Gathering of evidence regarding cause of death is not an EMS function but rests solely with law enforcement and the medical examiner's office.

DETERMINATION OF DEATH: MEDICAL P - 51

PROCEDURE v2.2 (8-6-2018) Effective 11-1-2014

Rationale: To provide guidance on how death of a medical patient will be determined and documented.

Indications: Medical patients in whom EMS is determining death, i.e. triaging black. Primarily applies to patients who are pulseless and apneic on EMS arrival, but also provides guidance on patients triaged blue who fail to respond to resuscitation and are retriaged black. The initial 2 criteria for determining death are **pulselessness** and **apnea**.

Contraindications/ Precautions:

- Determination of death is contraindicated in patients who do not meet specific criteria as specified in **MEDICAL CEASE RESUSCITATION (MC-9)**. For patients not meeting criteria in **MC-9**, resuscitation is to continue until physician or onscene credentialed critical care paramedic contact has been made and the physician or onscene credentialed critical care paramedic has determined that resuscitation efforts should cease.
- Credentialed critical care paramedics will make decision taking into consideration:
  - Age
  - Duration of resuscitation
  - Co-morbidities
  - $EtCO_2$
  - Origin of cardiac arrest
  - Witnessed arrest vs non-witnessed
  - Bystander CPR
- If there is potential that death is not of natural causes, the scene should be preserved for law enforcement assessment or coroner assessment.

Necessary Equipment

Minimum: Stethoscope

Necessary Monitoring

For medical patients triaged blue and resuscitation has been attempted:

- Cardiac monitor and recorded monitor strips that can be downloaded and appended to patient record.

For medical patients initially triaged black:

- Cardiac monitor is NOT required, but may be applied if provider is uncertain if a pulse is felt.

Procedure:

- In patients with apparent death (suspected triage black), patients must be pulseless and apneic AND have specific criteria that are incompatible with life or meet criteria for Do Not Initiate Resuscitation as follows:
  - Rigor mortis
  - Decomposition
  - Valid DNR / TPOPP order. If no written order is found but a spouse / POA reports patient did not wish resuscitation, contact medical command.
  - Adult only: > 15 minute down time AND no bystander CPR AND initial rhythm asystole

- Patient documentation should specify which criteria are used to triage black
- Once patients meet these criteria, you must still confirm that patient is pulseless and apneic as follows:
  - After opening airway with BLS maneuvers, assess for spontaneous respirations for at least 30 seconds by listening with stethoscope and hand on chest to confirm there is no spontaneous chest rise or respiratory effort.
  - Assess carotid or femoral pulses while simultaneously auscultating the cardiac apex for a minimum of 30 seconds to confirm lack of mechanical cardiac activity.
  - Advanced decomposition does not require these steps.

- Treat deceased patients with respect. Cover the patient if appropriate, protect from unnecessary exposure without disturbing the body. The body should not be moved once death is determined without approval from LEO or coroner.
- Notify family of death using a structured notification method such as **DEATH NOTIFICATION: GRIEV-ING Reference (R-24)**
- Notify law enforcement of death. At provider / Division Leader discretion, if appropriate and a natural cause of death is suspected, a discussion with LEO is encouraged if to see if patient can be moved to a more dignified location (i.e. from living room / outdoor resuscitation location to bed) until mortuary service arrives. This does not apply to coroner cases or cases where cause of death is unclear.

Documentation:

See **PATIENT CARE DOCUMENTATION Procedure (P-2)**

Considerations

- Dependent lividity has been removed as a criterion for determination of death.
- Times in the **MEDICAL CEASE RESUSCITATION Protocol (MC-9)** are times when providers may consider cease resuscitation, but by no means should it be considered hard and fast. Particularly in patients who are maintaining EtCO2 above 30 with CPR, or who are having rhythm changes, resuscitation should continue. Patients have survived prolonged resuscitations with quality CPR (as indicated by EtCO2 >30) neurologically intact.
- If there is potential that a patient may be resuscitated, it is expected that resuscitative efforts will be promptly initiated in accordance with protocol.
- As noted in **TRIAGE COLOR CODES Protocol (A-4)**, deceased patients will not be transported by EMS. If extenuating circumstances potentially exist that may warrant movement of a patient who has been declared dead (triage black), this should be discussed beforehand and agreement between the Division Leader, the appropriate law enforcement authority, and ideally the EMSS Medical Director to assure that evidence is not destroyed, the deceased is not moved between jurisdictions, etc.
- Because a cardiac monitor is not required to triage black, a BLS provider may triage black, but full documentation is required as above.
- Once death is declared, the EMS role is over. The scene should be preserved for law enforcement and the medical examiner until it is determined that it is not a medical examiner's case or a crime scene.

- The body should not be moved, nor should any of the surroundings be changed / moved / disturbed for any reason (this includes moving / gathering medications, finding ID, etc).
- Gathering of evidence regarding cause of death is not an EMS function but rests solely with law enforcement and the medical examiner's office.

Rationale: To provide guidance for how to perform rapid sequence intubation within the Critical Care Paramedic scope of practice.

Indications:

- Failure to protect and/or maintain airway
- Failure to oxygenate and ventilate
- Impending airway compromise (dynamic airway swelling, deteriorating LOC with anticipated difficulty bagging)

Contraindications/Precautions:

RSI should only be performed when it is necessary, never for convenience. There is significant risk with inducing apnea and removing all of a patient's own protective airway reflexes.

Necessary Equipment:

Cardiac Monitor
$EtCO_2$ Waveform Monitor
Bag Valve Mask
Properly sized endotracheal tube
Endotracheal tube securing device
Bougie
Video Laryngoscope (with multiple blades)
Standard Laryngoscope (with multiple blades)
Syringes
Medications to be administered
Backup airway (iGel)
Cricothyrotomy kit
Ventilator
Ventilator tubing

Procedure:

- Pre-oxygenation and denitrogenation should be initiated as early as possible once the decision to perform RSI has been made. This should be accomplished with high flow NC placed under a NRB or BVM which is also being run at high flow.
- ECG monitoring, SpO_2 monitoring, $EtCO_2$ monitoring, BP monitoring every 3 minutes.
- Prepare equipment, checklists, and assign roles
    - CCP should be positioned at head of patient
    - Medication administrator should be positioned at patient's left side
    - Airway assistant should be positioned at patient's right side with monitor in view
- IV/IO access obtained.
- Per CCP discretion, IV fluid boluses or vasopressor administration to prevent hypotension during procedure should be administered.
    - Phenylepherine 50-200 mcg (100 mcg/mL concentration) every 3-5 minutes or
    - Epinepherine 5-20 mcg (10 mcg/mL) every 3-5 minutes or
    - Norepinephrine 5-30 mcg/min, titrated to effect

- Initiate procedure timeout and verbalize plan A, B (iGel), and C (surgical cricothyrotomy), as well as abort parameters (for standard RSI, intubation attempt should be aborted at saturation of 93%). Perform MACC on all medications at this time. Airway assistant should begin calling out vital signs as they appear on the monitor.
- Administer induction agent (choose one).
    - Ketamine (preferred) 2 mg/kg IV or 4 mg/kg IM
    - Etomidate 0.3 mg/kg IV
- Administer paralytic
    - Rocuronium 0.6-1.2 mg/kg IV
    - Succinylcholine 2 mg/kg IV
- Perform intubation
- Post intubation management
    - Confirm placement with BVM ventilations and positive $EtCO_2$
    - Monitor vital signs including blood pressure, pulse rate, SpO_2, $EtCO_2$
    - Prevent hypotension and hypoxia
    - Perform secondary assessment
    - Decision to continue BVM ventilations through ETT or place patient on mechanical ventilator
    - Post intubation medications (repeat as necessary for sedation):
        - Fentanyl 1-2 mcg/kg
        - Ketamine 1-2 mg/kg
        - Midazolam 2.5-5 mg

Supporting Checklist Documents:

RSI Kit Checklist

Equipment

- ☐ Bougie
- ☐ Et Tube
- ☐ Et Securing Device
- ☐ Syringe
- ☐ Blades (multiple)
- ☐ Laryngoscope
- ☐ Video Scope
- ☐ I-Gel
- ☐ Cricothrotomy

Medications

- ☐ Etomidate/Ketamine
- ☐ Succinylcholine
- ☐ Rocuronium
- ☐ Fentanyl

Timeout Checklist for RSI

1 Assign Roles

- ☐ Medication Administrator
  Seated on bench
  Verify meds to be given and doses
- ☐ Airway Assistant
  Seated in CPR seat
  Verify vital signs called out constantly
  Abort intubation at 93%

2 Verbalize Plan

- ☐ Plan A
  RSI (video vs standard)
  Abort parameters
- ☐ Plan B
  iGel
- ☐ Plan C
  Cricothyrotomy

Post RSI Procedure List

- ☐ BVM Ventilation w/ Positive EtCo2
- ☐ Vital Signs
- ☐ Secondary Assessment
- ☐ Ventilator Decision

RSI Ventilator Startup Checklist

- ☐ Attach Circuit and Oxygen Tubing
- ☐ Turn on ventilator
- ☐ Select Same Patient
- ☐ Select Intubated or NIPPV
- ☐ Tidal Volume
  Tidal Volume 450 for males, 500 for males over 6 foot
  Tidal Volume 400 for females, 350 for females under 5 foot
- ☐ Mode
  AC/PRVC
- ☐ FiO2 Check/Double Check

SURGICAL CRICOTHYROTOMY P - 53

PROCEDURE Effective 8-6-2018

Rationale: To provide guidance for how to perform a surgical cricothyrotomy within the Critical Care Paramedic scope of practice in a "can't intubate, can't ventilate" situation.

Indications:

- Can't intubate, can't ventilate (CICV) scenario

Contraindications/Precautions:

- ability to secure an airway with less invasive means
- airway trauma that renders access via the cricothyroid membrane futile
  - e.g. laryngeal fracture, tracheal transection
- Children < 10 years of age
  - young children are prone to laryngeal trauma and they have a higher incidence of postoperative complications)
  - needle cricothyrotomy is generally prefered, however life-saving surgical cricothyroidotomy has been successfully performed in children

Necessary Equipment:

- scalpel blade (e.g. size 11)
- tracheal hook
- bougie
- size 6-0 ETT

Procedure:

- Locate cricothyroid membrane by palpation
- Using downward puncture technique with horizontal oriented blade, puncture the cricothyroid membrane,
- Leaving the scalpel in place, stabilize the scalpel in the left hand and use the right hand to insert the tracheal hook inferiorly along the scalpel and into the tracheal lumen. Rotate the point of the hook inferiorly and pull upward to secure the cricoid cartilage
- Maintain gentle upward pressure with right hand to maintain placement of tracheal hook on the cricoid cartilage and use the scalpel in the left hand to enlarge the incision sufficiently to facilitate the remainder of the procedure.
- Introduce bougie using left hand into the trachea through incision site. Confirm proper tracheal placement by feeling cartilaginous rings and bougie holdup at carina
- Leave the tracheal hook in place and introduce the endotracheal tube into trachea over bougie. Take care to avoid damaging the cuff of the tube on the tracheal hook as it passes.
- Remove the tracheal hook but leave the tube and bougie in place.
- Inflate the cuff of the tube and confirm that it holds pressure.

- Remove the bougie, connect bag valve mask, and confirm placement with $EtCO_2$ waveform capnography
- Secure endotracheal tube and address and incision site bleeding

Considerations:

- In patients where the anatomy cannot be easily palpated (e.g. obesity, short neck, neck swelling), a long midline longitudinal incision should be made to facilitate accurate identification of the cricothyroid membrane
- Significant bleeding may occur. This can be minimized by staying in the midline during the procedure. During procedure, priority should be placed on securing the airway first and controlling bleeding after procedure is completed

FINGER THORACOSTOMY P - 54

PROCEDURE Effective 8-6-2018

Rationale: To provide guidance for how to perform a finger thoracostomy within the Critical Care Paramedic scope of practice for patients presenting with tension phenomenon, particularly those in which needle thoracostomy has been or is anticipated to be ineffective.

Indications:

- Clinical thoracic tension pathology (tension pneumothorax, tension hemothorax, tension effusion)

Contraindications/Precautions:

- Approximately 7% of patients who undergo this procedure will be found to not actually have tension phenomenon.
- Use caution with local trauma: bone fragmentation/foreign bodies may pose risk to CCP performing procedure.

Necessary Equipment:

- Sterile gloves
- Scalpel
- Kelly clamp
- Betadine or chlorhexidine

Procedure:

- Recognize possible tension physiology.
- Locate 5th intercostal space at anterior/mid-axillary line.
- Clean with betadine or chlorhexidine.
- Don sterile gloves.
- Using a No. 10/11 scalpel, make a 4cm incision through skin over and parallel to the superior border of the inferior rib.
- Using Kelly clamps, quickly blunt dissect through subcutaneous tissue and muscle just over the superior border of the inferior rib.
- With closed Kelly clamps, puncture through the parietal pleura.
    - the "give" of the parietal pleura indicates access of the pleural space
    - if tension hemopneumothorax is present, you may hear a "whoosh" of air or note swift return of blood
- Remove the Kelly clamps from the tract and insert your full gloved finger into the space.
    - intrapleural palpation confirms access of the pleural space
    - re-expansion of the lung parenchyma may be palpated, especially if patient is receiving positive pressure ventilation (e.g. intubated)
- If lung is already expanded on palaption and there is no forceful air/fluid release, it may be possible to close the thoracic wound with occlusive dressing, obviating further tube thoracostomy.

Considerations:

- If patient is spontaneously breathing, once finger thoracostomy is performed, patient will likely require positive pressure ventilation in order to have effective lung expansion.
- Particularly in those with thicker chest walls, layers of tissue may slide over each other, effectively closing the thoracostomy incision. Reinserting the finger into the pleural space through the thoracostomy incision will likely be effective in re-opening the incision and relieve tension phenomena.

ACTIVATED CHARCOAL

Routes of Administration: Oral (PO)

Class: adsorbent

Dosage Range

Adult 25 g po

Pediatric: 25 g po. Do not administer to child who cannot drink the full dose on their own, effectively a child at least 4 years old. These children will be the exception, so it is unlikely you will administer this to pediatric patients.

Standard Formulation (alternate formulations): 25g with sorbitol

EMS Indications: As suggested by poison control for ingestions within an hour.

Protocols

M – 6: Toxic Ingestion

Action

Adsorbs toxins and inhibits GI absorption.

Adverse Effects

Serious: aspiration of charcoal

Common: nausea, vomiting

Drug Interactions

None in the EMS setting, but see administration considerations for impact on hospital care.

Administration Considerations

Should be avoided due to short transport times in ingestions that include acetaminophen (Tylenol). This is due to short transport time and the fact that charcoal administration interferes with the action of oral acetylcysteine (Mucomyst) administration which is the antidote for acetaminophen toxicity.

Charcoal administration is limited to within 1 hour of ingestion, and even there has limited utility from a toxicological perspective in most ingestions. This is particularly true if the patient has ingested a sedative agent which can be anticipated to impair respiratory effort and place the patient at risk of charcoal later in their course. Charcoal aspiration is to be avoided at all cost.

Guidance from Poison Control (1-800-222-1222) is strongly recommended before administering charcoal, particularly given the adverse GI effects of charcoal administration. Charcoal use, particularly with sorbitol, has not been shown to improve patient outcomes so has significantly fallen out of favor with toxicologists.

Contraindications

Significantly altered mental status

Impaired ability to maintain own airway or expectation of declining mental status due to ingested substance.

Caution if: intestinal obstruction

ASPIRIN

Routes of Administration: Oral (PO)

Class: Salicylate, antiplatelet agent

Dosage

Adult 325mg PO, chewed

Dosage Adjustment Considerations: None for single dose

Standard Formulation: 81 mg tablet, 325 mg tablet –non-enteric coated

EMS Indications: antiplatelet activity in suspected acute coronary syndrome

Protocols

MC – 1: Acute Coronary Syndrome: Adult

Action

Irreversible inhibition of cyclooxygenase, leading to inhibition of thromboxane A2 formation which inhibits platelet aggregation.

Pertinent Pharmacokinetics

Rapid absorption, 4-6 hour duration of action

Adverse Effects

Adverse effects are dose related and based on chronic use. Low / single dosages rarely have adverse effects.

Drug Interactions

None for single dose

Administration Considerations

If patient has not taken aspirin since 911 call was made, aspirin should be administered.
Tablet should be chewed completely for most rapid onset of desired antiplatelet action
Aspirin is NOT contraindicated in patients taking warfarin (Coumadin)

Contraindications

Pregnancy
Hypersensitivity to aspirin, salicylates and NSAIDS
Caution if: asthma
Chronic liver disease: single dose aspirin is still appropriate in STEMI

GLUCOSE

Routes of Administration: Oral (PO)

Class: Monosaccharide

Dosage Range (Maximum)

Adult 1 full tube = 24 g dextrose PO

Pediatric: < 2 years old: ½ tube = 12 g dextrose PO

≥ 2 years old: 1 full tube = 24 g dextrose PO

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 24 g dextrose in a 31 gram tube

EMS Indications: Treatment of hypoglycemia

Protocols

M – 1: Altered Mental Status

Action

Calorie / glucose replacement in patients with inadequate oral intake or excess insulin /oral hypoglycemic action

Pertinent Pharmacokinetics

Onset of action: 10 minutes

Adverse Effects

None in patients who can maintain their airway

Drug Interactions

None

Administration Considerations

Patient must be able to maintain airway to tolerate oral medication administration.

Contraindications

Inability of patient to maintain own airway and prevent aspiration of oral medication
Hyperglycemia
Hypersensitivity to corn or corn products
Caution if: known hepatic coma

NITROGLYCERIN

Routes of Administration: Sublingual (SL), Topical

Class: Vasodilator

Dosage Range (Maximum)

Adult Sublingual (SL) 0.3-0.6 mg every 5 minutes
Topical 1- 2 inches paste

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation: Sublingual: 0.4 mg
Topical: 2% ointment

EMS Indications: Treatment of cardiac ischemic chest pain and acute coronary syndromes
Management of decompensated congestive heart failure

Protocols

MC – 1: Acute Coronary Syndrome: Adult
M - 12: Respiratory Distress: Adult

Action

Forms free radical nitric oxide, ultimately resulting in smooth muscle relaxation and thus vasodilation. Vasodilatory effect is more prominent on the venous than the arterial system, resulting in reduced preload, coronary artery dilation and improved collateral blood flow to ischemic myocardium.

Pertinent Pharmacokinetics

Sublingual: onset of action 1-3 minutes, peak effect 5 minutes
Topical: onset of action 15-30 minutes, peak effect 7 hours

Adverse Effects

Serious: Severe hypotension, bradycardia, syncope, weakness, nausea.
Common: Hypotension, headache, hypotension

Drug Interactions

Phosphodiesterase 5 inhibitors = erectile dysfunction drugs: enhanced vasodilatory effect. Should not be given together, see "Contraindications" below.
Hypotensive agents (i.e. antihypertensives) may enhance hypotensive effect.
Ergot derivatives may diminish vasodilatory effect of nitroglycerin.

Administration Considerations

Avoid in inferior wall MI. If ordered by medical command, consider fluid bolus prior to administration.
Nitroglycerin should not be used to treat hypertension in the absence of EMS indications above.
May continue giving SL Nitroglycerin beyond 3 doses if it is decreasing pain and SBP remains above 90 mm Hg.
Nitroglycerin SL is preferred route. Give to patients able to take oral meds.
Give nitroglycerin topical:

- for patients on CPAP for suspected CHF together with either ischemic chest pain and / or significant hypertension and need for vasodilation.
- Consider requesting orders for topical nitroglycerin in patients with ischemic chest pain and marginal BP(SBP 90-110) or known hypotensive effect of nitroglycerin, as topical nitroglycerin can be wiped off if patient with significant hypotension.
- When ischemic pain is relieved with SLNTG to maintain continued NTG delivery

SBP should be monitored every 5 minutes when administering nitroglycerin, if patient who has Nitroglycerin topical applied becomes hypotensive, wipe off paste (take care not to get it on yourself).

Contraindications

Hypersensitivity to organic nitrates
Use of ANY erectile dysfunction drug within 48 hours, except sildenafil (Viagra) within 24 hours.
Use of pulmonary hypertension drugs in women such as sildenafil (Revatio)
Caution if: inferior wall MI with suspected right ventricular involvement (ST elevation in II, III, F)

PREDNISONE

Routes of Administration: Oral (PO)

Class: Corticosteroid, antiinflammatory

Dosage Range (Maximum)

Adult 60 mg PO

Pediatric: 1 mg/kg PO

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 20 mg tablet (10 mg tablet)

EMS Indications: Oral corticosteroid / anti-inflammatory for bronchospasm or allergic reaction

Protocols

M3 – Allergic Reaction / Anaphylaxis

M11 – Respiratory Distress: Pediatric

M12 – Respiratory Distress: Adult

Action

anti-inflammatory

Adverse Effects

Common: None in EMS care interval

Drug Interactions

None in EMS indications

Administration Considerations

Time to onset is effectively the same with oral or IV steroids and full effect is not reached for hours after administration

Oral steroid such as prednisone allows for early steroid therapy in patients with mild-moderate symptoms without requiring IV access

Give with PO liquid

Contraindications

Suspected infection (relative)

Myasthenia gravis

Hypersensitivity

Caution if: hypertension, congestive heart failure, diabetes

ALBUTEROL

Routes of Administration: Nebulized

Class: Bronchodilator, beta agonist

Dosage Range

Adult 5 mg nebulized OR 6 mg with ipratropium, may repeat

Pediatric: 5 mg nebulized OR 6 mg with ipratropium, may repeat

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 2.5 mg in 3 ml with albuterol only
3 mg in 3 ml with 0.5 mg ipratropium

EMS Indications: Treatment of bronchospasm
Adjunct for emergent treatment of hyperkalemia

Protocols

M – 3: Allergy / Anaphylaxis
M – 11: Respiratory Distress: Pediatric
M – 12: Respiratory Distress: Adult

Action

Relaxation of bronchial smooth muscle by action on beta 2 receptors

Pertinent Pharmacokinetics

Peak effect with nebulization: 0.5-2 hours, duration 3-4 hours

Adverse Effects

Tend to be dose-dependent

Serious: Seizure, arrhythmia, tachycardia, hypokalemia

Common: CNS stimulation, nervousness, hypertension

Drug Interactions

Beta blockers: may diminish therapeutic effect of albuterol

Cannabinoids: may enhance tachycardic effect

Administration Considerations

Initiate treatment with two “bullets” nebulized of either albuterol alone or in combination with ipratropium.

If ongoing treatment needed, use albuterol alone following albuterol / ipratropium combination.

For known hyperkalemia, requires medical command order to administer. For this indication, calcium chloride should be given first. Albuterol is more efficacious than bicarbonate in treating hyperkalemia, so these two interventions should be considered next.

Contraindications

Hypersensitivity

Caution if: tachyarrhythmia (not sinus tach)

IPRATROPIUM

Routes of Administration: Nebulized

Class: Anticholinergic

Dosage Range (Maximum)

Adult 1 mg nebulized, may give as needed (up to continuously) x 4 unit doses (total 2 mg iptratropium) in combination with albuterol

Pediatric: 1 mg nebulized, may give as needed (up to continuously) x 4 unit doses (total 2 mg iptratropium) in combination with albuterol

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation: 0.5 mg in 3ml in combination with Albuterol 3mg

EMS Indications: Asthma exacerbation

Protocols

M – 11: Respiratory Distress: Pediatric

M – 12: Respiratory Distress: Adult

Action

Blocks the action of acetylcholine at parasympathetic sites in bronchial smooth muscle, resulting in bronchodilation.

Pertinent Pharmacokinetics

Onset of action: bronchodilation within 15 minutes, peak effect 1-2 hours

Adverse Effects

Common: palpitations, headache

Drug Interactions

May enhance the effect of other anticholinergics

Administration Considerations

Administer a double dose of the premix nebulized solution together with albuterol for both adults and pediatrics. Further dosing is either with albuterol alone or repeat combination dosing with ipratropium.

This medication cannot be given by EMTs, but is permitted for AEMT and above.

Contraindications

Hypersensitivity

ADENOSINE

Routes of Administration: Intravenous (IV) rapid push

Class: Antiarrhythmic, endogenous nucleoside

Dosage Range (Maximum)

Adult: First dose 6 mg IVP, second dose 12 mg IVP
In a patient who has previously required 12 mg to convert, may use that as initial dose

Pediatric: First dose 0.1 mg/kg (MAX 6 mg) IVP, second dose 0.2 mg/kg (MAX 12 mg) IVP

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 3 mg/ml

EMS Indications: Chemical cardioversion of supraventricular tachycardia
Stable, narrow complex, regular tachycardia
Unstable, narrow complex, regular tachycardia—as an option prior to electrical cardioversion

Protocols

MC3 – Tachycardia: Adult
MC7 – Tachycardia: Pediatric

Action

by slowing AV node conduction time by interrupting AV note re-entry pathways

Pertinent Pharmacokinetics

Half life < 10 seconds

Adverse Effects

Serious: Severe bradycardia, ventricular fibrillation or tachycardia, atrial fibrillation, asystole, complete heart block, bronchospasm

Common: Flushing, dyspnea, chest pressure, nausea, lightheadedness, headache

Drug Interactions

Caffeine-containing medications, dipyridamole, green tea, theophylline: may make adenosine ineffective in cardioversion

Carbamazepine: may increase degree of heart block

Digoxin, Verapamil: additive effect--may increase risk of ventricular fibrillation

Administration Considerations

Medication should be administered in a large vein at the most proximal port and flushed immediately with 10-20cc of normal saline to assure rapid delivery to the central circulation

Adenosine may be ineffective in patients taking: caffeine-containing medications, dipyridamole, green tea, theophylline

Contraindications

Second or third degree atrioventricular block without pacemaker
Sick sinus syndrome without pacemaker
Acute bronchospasm
Hypersensitivity
Caution if: obstructive lung disease

AMIODARONE

Routes of Administration: Intravenous (IV)

Class: Antiarrhythmic, Class III (with some characteristics of other classes)

Dosage Range (Maximum)

Adult VF / pulseless VT: First dose 300 mg IV push, second dose 150 mg IV push
Wide complex VT with pulse: 150 mg IV over 10 minutes

Pediatric: 5 mg/kg (MAX 300 mg) IV. For

Dosage Adjustment Considerations: None for renal or hepatic impairment in EMS care

Standard Formulation (alternate formulations): 50 mg/ml

EMS Indications: Refractory, life threatening ventricular arrhythmias (VF / VT)
Stable tachyarrhythmias with wide QRS (VT with pulse, SVT with aberrancy)

Protocols

MC3 – Tachycardia: Adult
MC4 – Cardiac Arrest: Pediatric
MC5 – Cardiac Arrest: Adult
MC7 – Tachycardia: Pediatric

Action

Prolongs AV node refractory period by prolongation of action potential duration
Decreases sinus node automaticity.
Noncompetitive alpha and beta blocking properties which elongate PR interval, increase QRS width, prolong QT and slow sinus rate.
Relaxation of smooth and cardiac muscle and decrease in peripheral vascular resistance, SBP and afterload

Adverse Effects

Serious: Proarrhythmic effect (including VF), symptomatic severe bradycardia, hypotension (usually infusion rate related)

Common: Dizziness, bradycardia, nausea/vomiting

Drug Interactions

QT prolongation, arrhythmia: cisapride, dofetilide, dronedarone, quinolones, *multiple antivirals* (-vir suffix), toremifene*; multiple psychiatric meds*: ziprasidone, citalopram, haloperidol, trazodone, phenothiazines, venlafaxine; *multiple antibiotics*: -mycins, ciprofloxacin, trimethoprim, azole antifungals; ondansetron.

Hypotension: amlodipine/atorvastatin, calcium channel blocker, sotalol

Rhabdomyolysis: statin drugs

CNS depression/psychomotor impairment: benzodiazepines

Administration Considerations

Amiodarone is a potent vasodilator and is likely to produce hypotension in non-arrest patients, particularly in the geriatric population.

Cardiac arrest: dilute to a total volume of 20 ml and inject rapidly.

Non-arrest: dilute in a 150 ml bag of NS and give over at least 10 minutes for adult, 20-30 min for pediatrics, monitor for hypotension. If hypotension occurs, decrease administration rate by half.

Contraindications

Second or third degree atrioventricular block or sick sinus syndrome without pacemaker
Cardiogenic shock
History of torsades or QT prolongation
Iodine hypersensitivity
Neonate / infant: benzyl alcohol in formulation can cause potentially fatal gasping syndrome
Caution if: hypokalemia, hypomagnesemia (may increase proarrhythmic effect)

ATROPINE

Routes of Administration: Intravenous (IV) or Intramuscular (IM)

Class: Anticholinergic, antimuscarinic subtype

Dosage Range (Maximum)

Adult: Bradyarrhythmia (symptomatic): 0.5 mg IV every 5 minutes to MAX of 3 mg
Organophosphate poisoning: 2 mg IV / IM every 5 minutes until effect

Pediatric: Bradyarrhythmia (symptomatic): 0.02 mg/kg IV (MAX 0.5 mg/dose) every 5 minutes to MAX of 3 mg
Organophosphate poisoning:): 0.05 mg/kg IV (MAX 1 mg/dose) every 5 minutes until effect

Dosage Adjustment Considerations for EMS: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 1 mg/ 10ml

EMS Indications: Symptomatic bradycardia
Toxic ingestion of cholinergic / organophosphate agents
Atropine IS NOT recommended in cardiac arrest for asystole or PEA regardless of rate

Protocols

MC2 – Bradycardia: Adult
M6 – Toxic Ingestion

Action

Competitive antagonist of muscarinic activity of acetylcholine. Reduction in secretions from salivary, bronchial, and sweat glands, increase in heart rate, bronchodilation. Therapeutic action stems mainly from effect on smooth muscles and glands, particularly in GI tract, pulmonary smooth muscle, heart, eye, and exocrine glands.

Adverse Effects

Serious: Arrhythmias, disorientation, hallucinations, coma, agitation, dysarthria
Common: dry mouth, dilated pupils, blurred vision, intensely flushed skin, tachycardia, hypertension

Drug Interactions

Tricyclic antidepressants, phenothiazines (including haloperidol): additive drowsiness

Administration Considerations

Doses less than 0.5 mg or excessively slow administration may paradoxically worsen bradycardia
Atropine is indicated for organophosphate exposure with signs of toxicity:

- any severe symptoms: confusion, severe respiratory distress or lung secretions, severe muscle twitching and general weakness, involuntary urination or defecation, seizures, unconsciousness
- 2 or more mild symptoms: blurred vision, increased salivation, chest tightness or dyspnea, tremors, muscle twitching, nausea or vomiting, unexplained wheezing or coughing, acute stomach cramping, tachycardia, bradycardia

Autoinjector should be administered in mid-lateral thigh. If multiple doses required, sites should be rotated

Contraindications

Glaucoma
Myasthenia gravis
ST-elevation MI (relative)
Third degree heart block (relative contraindication)
COPD (relative)

CALCIUM

Routes of Administration: Intravenous (IV)

Class: Electrolyte

Dosage Range

Adult: Hyperkalemic cardiac arrest: 1 gm of 10% solution IV over 2 minutes
Hypermagnesemia with AMS: 500 mg of 10% solution IV
Calcium channel blocker toxicity: 1 gm of 10% solution IV over 5 minutes

Pediatric: 20 mg/kg of 10% solution IV over 5 minutes

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 1 gm / 10 ml (10% solution)

EMS Indications: Membrane stabilization in suspected hyperkalemic cardiac arrest (not routine)
Treatment of symptomatic hypermagnesemia
Treatment of symptomatic calcium channel blocker toxicity

Protocols

M6 – Toxic Exposure
MC5 – Cardiac Arrest: Adult
MC6 – Post Resuscitation

Action

Replacement of calcium, competitive with other cations—magnesium, potassium

Adverse Effects

Serious: arrhythmogenic (esp in patients on digoxin), hypotension, syncope, cardiac arrest; localized tissue necrosis with extravasation

Common: Nausea/vomiting, flushing

Drug Interactions

Digoxin: arrhythmogenic

Administration Considerations

Medication should be administered in a reliable IV line, as extravasation can cause severe tissue necrosis

Rapid injection may cause hypotension, bradycardia, arrhythmias(incl VF) and cardiac arrest

In non-arrest situations, it is an option to add the appropriate dose of Calcium chloride to a 50 or 150 cc bag of fluid and run in over the specified time period.

Medication mixing example: see extracted chart below. In a 5kg patient, 1 ml of calcium chloride 10% should be administered to provide the correct dose of 100 mg, which should be administered as noted above under adult or pediatric.

Contraindications

Ventricular fibrillation
Hypercalcemia
Digoxin therapy (relative in non-cardiac arrest)

Caution if: renal disease

	5 kg	30 kg	40 kg	50-74 kg
Calcium Chloride IV	**100 mg**	**600 mg**	**800 mg**	**1g**
Calcium Chloride 10% (ml) IV	**1 ml**	**6 ml**	**8 ml**	**10 ml**

DEXTROSE

Routes of Administration: Intravenous (IV)

Class: Monosaccharide

Dosage Range (Maximum)

Adult Dextrose 50%: 25 grams

Pediatric: 0.5 – 1 gram/kg (MAX 25 grams)
< 6months old: Dilute to Dextrose 10%
≥ 6 months old: Dilute to Dextrose 25%

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): Dextrose 50% (25 g in 50 ml)

To make Dextrose 25%: dilute desired dose of dextrose 50% with an equal volume of saline.

To make Dextrose 10%: dilute desired dose of dextrose 50% with four times its volume of saline.

EMS Indications: Treatment of hypoglycemia

Protocols

MC – 4: Cardiac Arrest: Pediatric
MC – 5: Cardiac Arrest: Adult
MC – 6: Post Resuscitation Care
M – 1: Altered Mental Status

Action

Calorie / glucose replacement in patients with inadequate oral intake or excess insulin /oral hypoglycemic action

Adverse Effects

Related to excessive dosage or rate of infusion, and short term may include hyperglycemia and hypokalemia.

Extravasation out of vein results in pain and tissue necrosis.

Drug Interactions

None

Administration Considerations

Dilute as appropriate for patient age. The "Dextrose IV" column shows the dose to be given, the "Dextrose 50%" column shows how much Dextrose 50 to draw up (i.e. 4 ml for a 5 kg patient), then dilute to 10% (i.e. total volume of 20 ml, obtained by adding 16 ml of saline to the 4 ml of Dextrose 50%), then administer.

Administer through reliable IV access. If patient complains of pain, stop administration and reevaluate patency of line to avoid extravasation and tissue necrosis.

Contraindications

Hyperglycemia
Hypersensitivity to corn products

	5 kg	7 kg	9 kg	10 kg	12 kg	15 kg	20 kg	30 kg	40 kg	50-74 kg	≥75 kg	Geriatric
Dextrose IV	2 gm	3.5 gm	4.5 gm	5 gm	6 gm	8 gm	10 gm			25 gm	25 gm	25 gm
Dextrose 10% (ml) IV	20 ml	35 ml	45 ml	50 ml	60 ml	75 ml	100 ml					
Dextrose 25% (ml) IV					24 ml	30 ml	40 ml	60 ml	80 ml			
Dextrose 50% (ml) IV	4 ml	7 ml	9 ml	10 ml	12 ml	15 ml	20 ml	30 ml	40 ml	50 ml	50 ml	50 ml

DIPHENHYDRAMINE

Routes of Administration: Intravenous (IV)

Class: Antihistamine with anticholinergic properties

Dosage Range (Maximum)

Adult 50 mg IV / IM

Geriatric: 12.5 mg IV, 25 mg IM

Pediatric: Do not give below age 2 years without physician order.
0.5 mg/kg IV, 1 mg/kg IM

Dosage Adjustment Considerations: Use geriatric dosing with hepatic or renal impairment

Standard Formulation (alternate formulations): 50 mg/ml

EMS Indications: Histamine-mediated allergic reactions (i.e., insect stings)
Acute dystonic reaction to antipsychotics

Protocols

M3 – Allergic Reaction / Anaphylaxis
M6 – Toxic Ingestion

Action

Competes with histamine for binding at H1 receptors in the bronchial muscle, GI tract, and large blood vessels. Suppresses formation of edema and pruritus.

Adverse Effects

Serious: CNS depression (particularly in pediatrics and geriatrics), confusion, dysarthria, weakness. Paradoxical stimulation in children. Seizures

Common: abdominal pain, diarrhea, dry mouth, urinary retention

Drug Interactions

MAO Inhibitors

Administration Considerations

Do not give below age 2 years without physician order due to respiratory depression / sedation

Contraindications

Closed angle glaucoma
MAO Inhibitor

Caution if: obstructive lung disease, asthma, prostatic hypertrophy, urinary retention, GI obstruction

DOPAMINE

Routes of Administration: Intravenous (IV) drip

Class: Adrenergic agonist

Dosage Range (Maximum)

Adult: Start at 5 mcg/kg/minute (may titrate up to 20 mcg /kg/minute) to desired response (target SBP 90-100)

Dosage Adjustment Considerations: None

Standard Formulation (alternate formulations): 800 mcg / ml premixed drip

EMS Indications: Treatment adjunct for shock which persists after adequate volume replacement in adults

Third-line treatment option for symptomatic adult bradycardia (after atropine and pacing ineffective)

Protocols

MC – 2: Bradycardia: Adult

MC – 6: Post-Resuscitation Care

Action

Produces peripheral vasoconstriction. Stimulates adrenergic and dopaminergic receptors in a dose-dependent way.

5-15 mcg/kg/min: increased heart rate, cardiac contractility, cardiac output, and renal blood flow (beta1-adrenergic and dopaminergic effects)

>15 mcg/kg/min: vasoconstriction, increased blood pressure (alpha adrenergic effect)

Pertinent Pharmacokinetics

Onset of action: 5 minutes; duration of action < 10 minutes

Adverse Effects

Serious: aberrant conduction, widened QRS, ventricular arrhythmia (at high doses), hypertension, tissue necrosis with extravasation

Common: tachycardia / palpitations, ectopic beats, hypotension, vasoconstriction, nausea / vomiting

Drug Interactions

May enhance toxic effect of other sympathomimetics

Administration Considerations

Must be given through a free-flowing IV line, infiltration causes severe tissue necrosis.

Dopamine has dose-dependent hemodynamic effects

Contraindications

Ventricular fibrillation

Pheochromocytoma

Hypersensitivity to sulfites

Caution if: post-myocardial infarction, taking MAO inhibitors (may cause prolonged hypertension), cardiac disease or arrhythmias

Chart shows gtts/minute for 60 gtt set with 800 mcg/ml dopamine concentration (premixed)	50 kg	75 kg	100 kg	125 kg	150 kg
Dopamine 5 mcg/kg/min	19	28	38	47	56
Dopamine 10 mcg/kg/min	38	56	75	94	113
Dopamine 15 mcg/kg/min	56	85	113	141	169
Dopamine 20 mcg/kg/min	75	113	150	188	226

EPINEPHRINE

Routes of Administration: Intravenous (IV), intramuscular (IM), intravenous drip, nebulized

Class: Alpha / beta agonist, sympathomimetic, inotrope

Dosage Range

Adult
Cardiac arrest: Epinephrine 1:10,000, 1 mg IV every 3- 5 minutes
Allergic reaction/ asthma: Epinephrine 1:1000, 0.5 mg SQ/IM

Pediatric:
Cardiac arrest: Epinephrine 1:10,000, 0.01 mg/kg (= 0.1 ml/kg) IV
Allergic reaction/asthma: Epinephrine 1:1000, 0.01 mg/kg SQ/IM (MAX 0.5 mg). May be repeated in 20 minutes if ordered by medical command.
Croup: < 4 yrs old: 2.5 mg (= 2.5ml) of Epi 1:1000 diluted to a total of 3 ml with saline, nebulized
≥ 4 yrs old: 4 mg (= 4 ml) of Epi 1:1000, nebulized

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): Epinephrine 1:1000 = 1 mg/ ml
Epinephrine 1:10,000 = 0.1 mg/ml

EMS Indications: Treatment of severe bronchospasm, croup, anaphylaxis
Treatment of cardiac arrest
Pressor for hypotensive pediatric patients after adequate volume repletion

Protocols

MC – 4: Cardiac Arrest: Pediatric
MC – 5: Cardiac Arrest: Adult
MC – 6: Post Resuscitation Care
M – 3: Allergic Reaction
M – 11: Respiratory Distress: Pediatric
M – 12: Respiratory Distress: Adult

Action

Potent, nonselective agonist of alpha and beta receptors. Alpha action produces arteriolar vasoconstriction. Beta-1 action produces positive chronotropic and inotropic response, which results in increased myocardial oxygen requirement. Beta-2 action produces arteriolar vasodilation and bronchial smooth muscle relaxation.

Pertinent Pharmacokinetics

Onset of action is variable after IM administration: 1-4 hours. Inhalation: 1-5 minutes with duration of action 1-3 hours

Adverse Effects

Serious: Dysrhythmia (including VF / VT), tissue necrosis, hypertension
Common: anxiety, palpitations, nausea, vomiting

Drug Interactions

Sympathomimetics: additive pharmacodynamic effects
Beta blockers: antagonize positive inotropic and chronotropic effects of epinephrine and exaggerate vasoconstriction
Cardiac glycoside (i.e. digoxin): proarrhythmic
MAOI, cocaine, tricyclic antidepressants: potentiate activity and risk hypertensive crisis, proarrhythmia

Administration Considerations

Avoid use in non-cardiac arrest patients with cardiac disease for reasons noted in Action, Drug Interaction, and Contraindication sections. If needed, use extreme caution in these patients.

For allergic reactions, intramuscular epinephrine is far preferable to SQ. IM dose should be administered in the anterior thigh whenever possible. Absorption may be increased by massaging the area of injection.

Intravenous epinephrine should not be used except in the setting of cardiac arrest due to the potent beta-1 actions as noted above that can cause true myocardial ischemia, even in young patients.

Take care to avoid extravasation when administering IV as it can cause severe tissue necrosis.

Epi drip:

Mix Epinephrine drip to 4 mcg/ml concentration as follows: add 0.6 mg epinephrine (= 6ml of 1:10,000 ***OR*** 0.6ml of 1:1000) to 150 ml bag

Affix preprinted label to drip, note patient weight, date and time drip started

EPINEPHRINE 4 mcg/ml

(0.6 mg of Epinephrine (= 6ml of 1:10,000 ***OR*** 0.6ml of 1:1000) in 150cc , 60gtt set)

Patient weight ____ kg

Drip started on __/__/__ at _____ hours

Contraindications

Severe organic cardiac disease

Phenothiazine overdose (results in exaggerated beta effect and hypotension)

Closed angle glaucoma

Sulfite hypersensitivity (unless in cardiac arrest or anaphylaxis)

In non-cardiac arrest situations, caution if: hypertension, diabetes mellitus, concomitant use of albuterol or other sympathomimetics (including cocaine, dopamine, albuterol, salmeterol) due to additive effect.

Mix 4 mcg/ml drip by adding 0.6 mg of epinephrine to 150 ml bag	**5 kg**	**7 kg**	**9 kg**	**10 kg**	**12 kg**	**15 kg**	**20 kg**	**30 kg**	**40 kg**
Epinephrine gtt (mcg/min) IV-- starting dose of 0.1 mcg/kg/min	**0.5 mcg/ min**	**0.7 mcg/ min**	**0.9 mcg/ min**	**1 mcg/ min**	**1.2 mcg/ min**	**1.5 mcg/ min**	**2 mcg/ min**	**3 mcg/ min**	**4 mcg/ min**
Epinephrine 4 mcg/ml gtt (gtt/min) IV-- 0.1 mcg/kg/min on 60gtt/ml set STARTING dose	**8 gtt/ min**	**11 gtt/ min**	**14 gtt/ min**	**15 gtt/ min**	**18 gtt/ min**	**23 gtt/ min**	**30 gtt/ min**	**45 gtt/ min**	**60 gtt/ min**
Epinephrine 4 mcg/ml gtt (gtt/min) IV-- 0.5 mcg/kg/min on 60gtt/ml set MAX dose	**40 gtt/ min**	**55 gtt/ min**	**70 gtt/ min**	**75 gtt/ min**	**90 gtt/ min**	**115 gtt/ min**	**150 gtt/ min**	**225 gtt/ min**	**300 gtt/ min**

Routes of Administration: Intravenous (IV), intramuscular (IM), intranasal (IN)

Class: Synthetic opiate agonist

Dosage Range

Adult 50-74 kg: 50 mcg IV / IM, 100 mcg IN
>75 kg: 75 mcg IV / IM, 100 mcg IN Geriatric: 25 mcg IV / IM, 50 mcg IN

Pediatric: IV / IM: 1 mcg/kg (MAX 25 mcg) IN: 2 mcg/kg (MAX 50 mcg)

Dosage Adjustment Considerations: Use geriatric dosing for renal or hepatic impairment

Standard Formulation (alternate formulations): 50 mcg / ml

EMS Indications: Analgesia

Protocols

MC – 1: Acute Coronary Syndrome
MC – 2: Bradycardia: Adult
MC – 3: Tachycardia: Adult
MC – 7: Tachycardia: Pediatric
M – 8: Pain Management

Action

Strong agonist at both the mu and kappa opiate receptors, causing changes in pain perception at the spinal cord level and higher levels in the CNS, producing analgesia, pupillary constriction, and respiratory depression. A 100 mcg dose is approximately equipotent to 10 mg morphine.

Pertinent Pharmacokinetics

Fentanyl has a more rapid onset of action than morphine and a shorter duration of action. Onset of analgesia with IM administration is 7-15 minutes and persists 1-2 hours. For IV administration, analgesia onset is within minutes and lasts 30-60 minutes. Intranasal administration results in maximum plasma concentrations in 15-21 minutes.

Adverse Effects

Serious: Respiratory depression and arrest, bradycardia, chestwall muscle rigidity
Common: Nausea, vomiting, rash

Drug Interactions

Amiodarone: increased incidence of adverse cardiac effects with fentanyl
Beta blockers, calcium channel blockers: risk of significant hypotension and/or bradycardia
Other CNS depressants (including benzodiazepines and haloperidol): potentiated respiratory depressant effect

Administration Considerations

Caution when giving both opioids and benzodiazepines, the respiratory depressant effect is more than additive, it is synergistic.

Patients receiving opioid pain medication should have their respiratory effort and oxygenation monitored. Continuous oxygen saturation monitoring is a requirement when using both opioid and benzodiazepines together because of the synergistic effect noted above, Providing supplemental oxygen makes this monitoring more complicated because superoxygenated patients could be apneic for some time before beginning to desaturate.

If chestwall rigidity is noted, respirations should be assisted.

Respiratory depression persists longer than analgesia, so repeated doses can potentiate the respiratory depressant effect. This is why only two doses are permitted on standing orders. Consider the above-noted times of onset, particularly since if the first dose has not had time to act and multiple repeat doses are given, there is significant risk of respiratory depression and other adverse effects which are dose-dependent.

Patients on chronic narcotic therapy may require higher doses due to development of opioid tolerance. Chronic narcotic therapy is using at least 60 mg/day oral morphine, 30 mg/day oral oxycodone, 8 mg/day oral hydromorphone, 25 mcg transdermal fentanyl/hour, or an equianalgesic dose of another opioid for a week or longer.

Contraindications

Hypersensitivity

Caution if: asthma, COPD, severe head trauma (due to resp depression)

GLUCAGON

Routes of Administration: Intravenous (IV), intramuscular (IM), intranasal (IN)

Class: Hormone – antihypoglycemic agent

Dosage Range

Adult
- Hypoglycemia: 1 mg IM / IN
- Beta blocker toxicity: 4 mg IV. Maintenance infusions of 1-5 mg/hour may also be needed to maintain the effect

Pediatric:
- Hypoglycemia: < 20 kg: 0.5 mg IM / IN
- Beta blocker toxicity: 0.06 mg/kg IV, max 4 mg

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 1 mg/ml, supplied as powder and diluent for reconstitution. Autoinjectors are expected to be available at some point.

EMS Indications:
- Severe hypoglycemia in diabetes
- Symptomatic (significant hypotension, bradycardia) in known beta blocker or calcium channel blocker overdose

Protocols

M – 1: Altered Mental Status
M – 6: Poisoning / Toxic Ingestion

Action

Antihypoglycemic: Initiates enzymatic cascade that activates phosphorylase, promoting breakdown of glycogen in the liver to glucose. Thus, the magnitude of its effect is dependent on presence of liver glycogen.
Inotropic and chronotropic: These effects are poorly understood but useful in beta blocker and calcium channel blocker toxicity.
GI smooth muscle: relaxes smooth muscle

Pertinent Pharmacokinetics

Antihypoglycemic: IM: 30 minutes to maximum glucose
GI smooth muscle: IM: 4-10 minutes; IV: 1 minute to effect

Adverse Effects

Serious: Hypertension, anginal chest pain in patients with cardiac disease
Common: Nausea / vomiting

Drug Interactions

Beta blockers therapy may limit the hyperglycemic effect of glucagon

Administration Considerations

If given IV for symptomatic overdose, expect nausea / vomiting due to the near immediate effect on GI smooth muscle. Patients should be premedicated with ondansetron to limit this effect.

A transient increase in pulse and blood pressure may be noted following IM administration, more pronounced in higher IV doses.

Contraindications

Pheochromocytoma, insulinoma
Hypersensitivity
Caution if: coronary artery disease

HALOPERIDOL LACTATE

Routes of Administration: Intravenous (IV) or intramuscular (IM)

Class: Antipsychotic

Dosage Range

Adult	IV: 5mg	IM: 10mg
Geriatric	IV: 2.5 mg	IM: 5 mg
Pediatric:	≥ 40 kg, only with medical command order. IV: 2.5 mg IM: 5 mg May not be given for children under 40kg—benzodiazepines alone should be used in that age group if needed.	

Dosage Adjustment Considerations: Use geriatric dosing (half adult dose) for renal impairment

Standard Formulation: 5 mg/ml

EMS Indications: Emergency management of severely agitated or psychotic patients

Protocols

M – 10: Behavioral Emergencies

Action

Blocks postsynaptic dopaminergic receptors, depresses reticular activating system and thus decreases wakefulness and vasomotor tone

Pertinent Pharmacokinetics

Onset of action with IV / IM administration: 30-60 minutes per reference material, time to serum peak following IM administration; 20 minutes. Practically speaking, some effect is noted within 10 minutes.

Adverse Effects

Serious:	QT prolongation and life-threatening arrhythmias including torsades, orthostatic hypotension, bronchospasm, laryngospasm
Common:	sedation

Drug Interactions

Anticholinergics, metoclopramide: enhances toxic effect
Chlorpromazine, Ciprofloxacin, Fluoxetine (Prozac): enhances QTc prolonging effect
CNS depressant, NSAIDs, ethanol: enhances CNS depression

Administration Considerations

When giving IM, may give in same syringe with lorazepam. Lorazepam would not require dilution in that case.
Whenever possible, patients who have received haloperidol should be placed on cardiac monitor to obtain baseline 12-lead ECG and monitor for QT prolongation. Often, this is not practical in this patient group until the medication begins to take effect.
Patients for which haloperidol is a consideration may be under the influence of one or more substances and are at risk of excited delirium, which carries a significant risk of death if not appropriately managed. Diligent monitoring of patient mental status, vital signs, and ideally cardiac rhythm (and QT interval) is necessary.
Variable compatibility with metoclopramide, midazolam, morphine—see **IV MEDICATION COMPATIBILITY** (F-52)

Contraindications

Parkinson's disease
Severe CNS depression or coma
Hypersensitivity to haloperidol
Caution if: known prolonged QT syndrome, hypokalemia or hypomagnesemia, seizure disorder, myasthenia gravis, narrow angle glaucoma

HYDROXOCOBALAMIN

Routes of Administration: Intravenous (IV) drip over 15 minutes

Class: Cyanide antidote, vitamin B12a

Dosage Range:

Adult: 5 g IV over 15 minutes, diluted in 200 ml normal saline to produce a 25 mg/ml concentration

Pediatric: Safety and efficacy in pediatrics has not been established. Should medical command choose to order a dose for a pediatric patient, the dose is 70 mg/kg.

Dosage Adjustment Considerations: None for age, or renal or hepatic impairment

Standard Formulation (alternate formulations): 5g lyophilized dark red crystalline powder

EMS Indications: Treatment of known or suspected cyanide poisoning with severe symptoms. Cyanide poisoning should be suspected in a patient with significant smoke exposure from an enclosed space fire or known cyanide exposure and severe symptoms not attributable to another apparent cause.

Severe symptoms include severe altered mental status without apparent cause (i.e. normal glucose), seizures/coma, bradypnea/apnea, cardiovascular collapse and hypotension. Pupil dilation may also be noted, but is not a severe symptom. So a code red / peri-arrest patient who has been pulled from a house fire and does not have apparent signs of trauma as the primary etiology of the severe symptoms would be a candidate for hydroxocobalamin therapy.

Protocols

MC – 4: Cardiac Arrest: Pediatric
MC – 5: Cardiac Arrest: Adult
MC – 6: Post Resuscitation Care
M – 6: Poisoning / Toxic Ingestion

Action

Hydroxocobalamin binds cyanide ion, forming cyanocobalamin, which is excreted in the urine.

Adverse Effects

Serious: Ventricular ectopy, cardiac repolarization abnormalities, anaphylaxis

Common: Erythema (94%), rash (20%), nausea, headache, local infusion site reaction. Hypertension (SBP ≥ 180, DBP ≥110), tachycardia.

Drug Interactions

Incompatible with blood products, sodium nitrite, sodium thiosulfate (both are components of the old 3 part Lilly cyanide kit)

Administration Considerations

Hydroxocobalamin should not be administered until after appropriate A-B-C management is initiated.

Medication should NOT be administered if reconstituted solution is not dark red.

Whenever possible, should be administered in a dedicated line (no other meds given in that line).

Hydroxocobalamin has been noted to act as a potent vasopressor. Hypertension as noted above is NOT a reason to stop infusion.

Contraindications

Hypersensitivity to hydroxocobalamin, cyanocobalamin, cobalt

KETAMINE

Routes of Administration: Intravenous (IV), intramuscular (IM)

Class: Dissociative Hypnotic

Dosage Range

Adults and Pediatrics > 6 months:

Sedation: 2.5 – 5 mg/kg IM or 1.25-2.5 mg/kg IV with rounding of doses based on size and ease of administration as per individual protocols. Maximum dose 500 mg.

Dosage Adjustment Considerations: Geriatric: Consider giving lesser dose and titrate.

Standard Formulation (alternate formulations): 100 mg / mL (500mg/5mL)

EMS Indications: Procedural sedation, Safety sedation takedown

Protocols

MC – 2: Bradycardia: Adult

MC – 3: Tachycardia: Adult

M – 10: Behavioral Emergencies

Action

Antagonist of excitatory N-methyl D-aspartate (NMDA) amino acid receptors preventing communication between the limbic system and cerebral cortex creating dissociative anesthesia with potent analgesia effects. Interacts with opioid receptors. Stimulates cholinergic receptors.

Pertinent Pharmacokinetics

Ketamine has a wide margin of safety. A more rapid onset and shorter duration of action than fentanyl, haloperidol, and midazolam, when used for procedural sedation and analgesia (PSA). Onset of IV administration is 30 – 60 seconds persisting 5 - 15 minutes. For IM administration, onset is within 3 – 5 minutes and lasts 12 - 25 minutes.

Adverse Effects/ Side effects

- Emergence reaction (dysphoria, euphoria, vivid dreams, hallucinations, confusion, agitation, excitement), increased ocular pressure, eye-opening, pupil dilation, nystagmus
- Tachycardia, hypertension, increased cardiac output
- Respiratory stimulant, laryngospam, transient respiratory depression, bronchodilator, increases bronchial secretions.
- Vomiting, hypersalivation

Drug Interactions

None

Administration Considerations

Medical Command required for co-administering with opioids and/or benzodiazepines. Caution when co-administered, the CNS and respiratory depressant effect are synergistic creating hypoxic conditions. All medications should be given at the lower dose range.

Rapid (IV) infusion or higher doses have reportedly increased risk of vomiting, transient respiratory depression (apnea usually occur at peak CNS levels, IV 1-2 min, IM 4-5 min); and emergence reaction. IVSP (no faster than 1 – 2 min).

Stimulates the CNS to release catecholamines, rarely affects respiratory drive, leaves protective airway reflexes intact, and allows adequate ventilation that buffers acidosis. An ideal sedative and analgesia to administer to the moderate to severely injured patient who is hemodynamically compromised or pinned with prolonged extrication.

Capnography and oxygen saturation monitoring is a requirement for the administration of Ketamine to ensure adequate respiratory effort and aide in the detection of respiratory compromise.

Contraindications

Hypersensitivity

Caution if: ETOH, advanced age, cardiac disease, significant tachycardia & hypertension, Schizophrenia, Pregnancy class C (benefits must outweigh risk)

LIDOCAINE

Routes of Administration: Intraosseous (IO)

Class: Amide anesthetic

Dosage Range (Maximum)

Adult 40 mg IO slowly over 2 minutes, wait 1 minute to allow anesthesia to develop, flush with 5-10 ml saline, then give another 20 mg IO slowly over 1 minute.

Pediatric: 0.5 mg/kg (MAX 20 mg) IO slowly over 2 minutes, wait 1 minute to allow anesthesia to develop, flush with 2-5 ml saline, then give another 0.25 mg/kg (MAX 10 mg) IO slowly over 1 minute.

Additional dose of Lidocaine may be repeated in 10 minutes if needed (adult = 20mg, pediatric = 0.25 mg/kg).

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 2%

EMS Indications: Local analgesia for pain related to intraosseous infusion in conscious patients

Protocols: P – 41: Intraosseous Access Procedure

Action: Analgesic effects result from reversible nerve conduction blockade by diminished membrane permeability to sodium which increases the threshold for electrical excitability.

Pertinent Pharmacokinetics

Immediate onset of action with duration of 10-20 minutes

Adverse Effects

Serious: cardiac arrest, cardiac arrhythmias, hypotension, seizures, CNS toxicity (dose-related), methemoglobinemia

Common: anxiety

Drug Interactions

Amiodarone: sinus bradycardia

MAOI: increased risk of hypotension

Quinolones (ciprofloxacin, levofloxacin): QT prolongation and torsades

Haloperidol, citalopram: QT prolongation

Administration Considerations

To obtain the desired local anesthetic effect, lidocaine should be injected slowly into the intraosseous line and dwell time prior to second dose to maximize its exposure to the marrow cavity to be anesthetized rather than having it rapidly reach the central circulation. It should be given prior to beginning the infusion prophylactically in a conscious /semi-conscious patient.

Contraindications

Hypersensitivity to amide anesthetic

Caution if: hypotension, hypovolemia, myasthenia gravis, shock, cardiac disease, G6PD deficiency, preexisting methemoglobinemia

LORAZEPAM

Routes of Administration: Intravenous (IV), intramuscular (IM)

Class: Benzodiazepine

Dosage Range (Maximum)

Adult 2 mg IV / IM

Pediatric: 0.05 mg/kg IV / IM

Dosage Adjustment Considerations: For sedation: decreased dose for geriatric, hepatic impairment, renal impairment. Dose unchanged for seizures.

Standard Formulation (alternate formulations): 2 mg / 1 ml

EMS Indications: Alternate benzodiazepine medication when midazolam is unavailable.
Status epilepticus (seizures lasting > 5 min or repeated seizures without fully regaining consciousness between)
Sedation for severely agitated patients
Anxiolysis / sedation for painful procedure (cardioversion)

Protocols

MC – 2: Bradycardia: Adult
MC – 3: Tachycardia: Adult
MC – 6: Post Resuscitation Care
MC – 7: Tachycardia: Pediatric
M – 4: Seizure
M – 10: Behavioral Emergencies

Action

Produce CNS depression in a dose-dependent way, from sedation to anticonvulsant activity to coma via potentiation of GABA at its receptor and thus increasing inhibition of the reticular activating system.

Pertinent Pharmacokinetics

Time to sedation 5-20 minutes IV, anticonvulsant effect 5 minutes IV. Half life 40 hr in neonates, 16 hr in geriatrics, 32-70 hr in endstage renal disease.

Adverse Effects

Serious: respiratory depression and arrest, bradycardia, hypotension
Common: CNS depression

Drug Interactions

CNS depressants (such as opiates, benzodiazepines): additive effects

Administration Considerations

May be given in the same syringe for IM administration with haloperidol in patients with behavioral emergencies.
For IV administration, mix with an equal volume of diluents (such as normal saline), mix by gently inverting syringe (do not shake) until homogeneous solution is obtained.
Does not require dilution for IM administration.
Patients should have oxygen saturation and respiratory effort closely monitored following administration.
For sedation: use decreased dose for geriatric patients, hepatic impairment, renal impairment.
Dose does not need to be decreased for seizures in patients with hepatic or renal impairment.

Contraindications

Closed angle glaucoma
Severe respiratory insufficiency unless mechanically ventilated
Hypersensitivity to benzodiazepines, benzyl alcohol
Caution if: sleep apnea

MAGNESIUM SULFATE

Routes of Administration: Intravenous (IV)

Class: Electrolyte

Dosage Range (Maximum)

Adult 2 g IV

Pediatric: 25 mg/kg IV

Dosage Adjustment Considerations: decreased dose for geriatric, renal impairment.

Standard Formulation (alternate formulations): 50% solution (= 500 mg/ml)

EMS Indications: Anticonvulsant for patients with eclamptic seizures
Treatment of cardiac arrhythmias caused / potentiated by hypomagnesemia
Torsades de pointes
Life-threatening bronchospasm in asthma

Protocols

MC – 4: Cardiac Arrest: Pediatric
MC – 5: Cardiac Arrest: Adult
MC – 6: Post Resuscitation Care
M – 4: Seizure
M – 12: Respiratory Distress: Adult

Action

Direct action on myocardium by slowing rate of SA node impulse formation and prolonging conduction time. Stabilizes cellular membranes. Relaxes bronchial smooth muscle.

Pertinent Pharmacokinetics

IV onset of action is immediate. Duration of anticonvulsant activity: 30 minutes

Adverse Effects

Serious: cardiac arrest, respiratory paralysis, hypocalcemia
Common: flushing, hypotension and vasodilation (rate related)

Drug Interactions

Calcium channel blocker: enhance hypotensive effect
CNS depressants: enhance effect

Administration Considerations

Must be diluted to no greater than 10% solution for IV administration. Medication dosing chart shows the number of ml of 50% solution. Add that amount to a 50cc or 150cc bag of normal saline and run in over 15 minutes.

In non-cardiac arrest situations, it should be administered no faster than 150 mg/minute (so for 2 g, it should be administered over 15 minutes).

In cardiac arrest (for torsades), administer IV slow push over 1-2 minutes.

When given to non-arrest patients, monitor respiratory rate and blood pressure closely, monitor patient for signs of magnesium toxicity (hypotension, altered mental status, depressed respiratory effort, depressed cardiac function, conduction blocks, loss of reflexes)

Eclamptic seizing patients may require a second dose of 2 g, and may require concurrent benzodiazepine therapy to stop seizure activity.

Contraindications

Heart block
Hypersensitivity
Caution if: myasthenia gravis or other neuromuscular disease, renal impairment

METHYLPREDNISOLONE

Routes of Administration: Intravenous (IV)

Class: Steroid

Dosage Range (Maximum)

Adult 125 mg IV
Pediatric: 2 mg/kg IV
Dosage Adjustment Considerations: decreased dose for geriatric, renal impairment.

Standard Formulation (alternate formulations): 125 mg / 2 ml

EMS Indications: Antiinflammatory for severe bronchospasm or allergic reaction

Protocols

M – 3: Allergic Reaction / Anaphylaxis
M – 11: Respiratory Distress: Pediatric
M – 12: Respiratory Distress: Adult

Action

Decreases inflammation by suppression of leukocyte migration and reversal of increased capillary permeability

Pertinent Pharmacokinetics

IV onset of action is similar to that of oral prednisone.

Adverse Effects (short term)

Serious: pulmonary edema, anaphylaxis

Drug Interactions

None for EMS indications

Administration Considerations

Choose IV methylprednisolone in patients with severe symptoms. Patients with mild-moderate symptoms can receive oral steroids (prednisone) with a similar time of onset of action. Patients with moderate symptoms who will have IV access established may either have IV methylprednisolone or oral prednisome.

Contraindications

Hypersensitivity
Caution if: myasthenia gravis or other neuromuscular disease

MIDAZOLAM

Routes of Administration: Intravenous (IV), intramuscular (IM), intranasal (IN)

Class: Benzodiazepine

Dosage Range (Maximum)

Adult	IV: 2.5-5 mg	IM / IN: 5-10 mg
Pediatric:	IV: 0.05 mg/kg	IM / IN: 0.1 mg/kg

Dosage Adjustment Considerations: Half adult dose for geriatrics, renal or hepatic impairment

Standard Formulation (alternate formulations): 5 mg/ml

EMS Indications: Status epilepticus (seizures lasting > 5 min or repeated seizures without fully regaining consciousness between)
Sedation for severely agitated patients
Anxiolysis / sedation for painful procedure (cardioversion)

Protocols

MC – 2: Bradycardia: Adult
MC – 3: Tachycardia: Adult
MC – 6: Post Resuscitation Care
MC – 7: Tachycardia: Pediatric
M – 4: Seizure
M – 10: Behavioral Emergencies

Action

Binds benzodiazepine receptors on postsynaptic GABA neurons, increases inhibitory effect of GABA and results in a less excitable state and stabilization of neuronal membrane.

Pertinent Pharmacokinetics

Onset of action: IM: 15 min, IV: 3-5 min, IN (peds): 4-8 minutes. Regardless of this, a recent study found that time to seizure control is equally fast with IM and IV administration.

Adverse Effects

Serious: Respiratory depression and apnea (3% in peds), seizure-like activity, laryngospasm
Common: CNS depression, hypotension, pain at injection site
Paradoxical reactions are possible in children, resulting in hyperactive or aggressive behavior

Drug Interactions

Alcohol, CNS depressants: enhance CNS depressant effect

Administration Considerations

IM or possibly IN administration is preferred for the initial dose in status epilepticus.
Midazolam has some retrograde amnestic effect.
Hypotension is more common in pediatric patients or those with hemodynamic instability. It is also more common when midazolam is administered in combination with opioids.
Appropriate monitoring must be in place for patients receiving benzodiazepines, including pulse oximetry, cardiac monitor, and critical level vital sign monitoring (BP every 5 minutes). Noninvasive capnography may be helpful if available.
Ability to support airway must be promptly available (i.e. oxygen, BVM, suction).
Midazolam is solely a sedative. It has no analgesic properties.
Patients with history of chronic benzo and/or alcohol use may be tolerant and require higher dosing.
Variable compatibility with haloperidol. Compatible in syringe with morphine, ondansetron.

Contraindications

Acute narrow-angle glaucoma
Hypersensitivity
Caution if: impaired gag reflex, respiratory disease—increased risk of hypoventilation, renal impairment, concurrent use of other sedatives or ethanol

MORPHINE

Routes of Administration: Intravenous (IV), intramuscular (IM)

Class: Opiate analgesic

Dosage Range (Maximum)

Adult 2 – 6 mg based on age / weight

Pediatric: 0.1 mg/kg (MAX single dose 4 mg) IV

Dosage Adjustment Considerations: Decreased dosage for geriatric

Standard Formulation (alternate formulations): 8 mg/ml (4 mg/ml, 5 mg/ml)

EMS Indications: Alternate opiate medication when fentanyl is unavailable.
Analgesia

Protocols

MC – 1: Acute Coronary Syndrome
MC – 2: Bradycardia: Adult
MC – 3: Tachycardia: Adult
MC – 7: Tachycardia: Pediatric
M – 8: Pain Management

Action

Binds opiate receptors in the CNS, inhibiting ascending pain pathways and altering perception of and response to pain. Produces generalized CNS depression.

Pertinent Pharmacokinetics

Onset of action IV: 5-10 minutes

Adverse Effects (generally dose-dependent)

Serious: Respiratory depression, CNS depression, hypotension

Common: Nausea, vomiting, histamine release

Drug Interactions

CNS depressants: may enhance effect

Administration Considerations

Hypotension is more common when morphine is administered in combination with benzodiazepines.

Caution when giving both opioids and benzodiazepines, the respiratory depressant effect is more than additive, it is synergistic.

Appropriate monitoring must be in place for patients receiving opiates, including pulse oximetry, noninvasive capnography if available, and BP monitoring.

Administer slow IV push.

Histamine release is common and results in flushing, particularly along the course of the vein that the morphine was injected into. This is not an allergic reaction. If it persists, diphenhydramine may be requested to mitigate the histamine effect.

Contraindications

Severe asthma, respiratory depression, hypercarbia (in the absence of ventilator support)
Hypersensitivity to opioids
Caution in: head injury (may increase ICP), CNS depression

NALOXONE

Routes of Administration: Intravenous (IV), Intramuscular (IM), Intranasal (IN)

Class: Opioid antagonist

Dosage Range (Maximum)

Adult IV: begin with 0.5mg, titrate to effect. For IM or IN, give 2mg

Pediatric: 0.1 mg/kg (MAX 2 mg) IV, titrated to effect. For IM or IN, give full listed dose.

Dosage Adjustment Considerations: None for renal or hepatic impairment

Standard Formulation (alternate formulations): 1 mg/ml (0.4 mg/ml)

EMS Indications: Reversal (partial or complete) of symptomatic opioid drug effects such as respiratory depression.

Protocols

MC – 4: Cardiac Arrest: Pediatric
MC – 5: Cardiac Arrest: Adult
MC – 6: Post Resuscitation Care
M – 1: Altered Mental Status
M – 6: Poisoning / Toxic Ingestion

Action

Pure opioid antagonist that competes with and displaces narcotics at opioid receptor sites

Pertinent Pharmacokinetics

Onset of action: nasal 8-13 minutes, duration 30-120 minutes depending on route (IV has shorter duration of action)

Adverse Effects

Adverse effects are related to reversing dependency and precipitating withdrawal. Withdrawal symptoms are those of sympathetic excess.

Serious: Ventricular arrhythmias, cardiac arrest, tachycardia

Common: Nausea, vomiting

Drug Interactions

None known

Administration

Should be titrated IV 0.5 mg at a time to adequate respiratory effort—not necessarily to full alertness.

May precipitate symptoms of acute withdrawal in opioid-dependent patients, including pain, hypertension, sweating, agitation, irritability.

Do not mix with alkaline solutions

For patients who have ingested long-acting opioids (i.e. methadone) or sustained-release opioids, repeat dosing may be needed

Contraindications

Hypersensitivity

Caution if: seizure disorder, chronic narcotic user—can precipitate severe, immediate opiate withdrawal syndrome and sympathetic overload

NORMAL SALINE

Routes of Administration: Intravenous (IV)

Class: Crystalloid

Dosage Range (Maximum)

Adult 250ml -2L bolus, based on assessment findings

Pediatric: 20 ml/kg IV bolus

Standard Formulation (alternate formulations): 50 ml, 150 ml, 1000 ml

EMS Indications: Fluid resuscitation for hypovolemia
Diluent for medication administration

Action

Expands circulating fluid volume

Adverse Effects

Serious: fluid overload (dose-dependent)—more likely in patients with cardiac dysfunction

Administration Considerations

Warmed saline should be administered to trauma patients when appropriate. Severe trauma patients have worse outcomes if they become hypothermic, which is possible even when temperatures are moderate.

Chilled saline should be initiated intra-arrest or in post-resuscitative period for cardiac arrest patients.

Response to therapy should be monitored by reassessment of vital signs following boluses.

Contraindications

Caution if: pulmonary edema

ONDANSETRON

Routes of Administration: Intravenous (IV) over 2-5 minutes

Class: Antiemetic

Dosage Range (Maximum)

Adult 4 mg IV (8mg max) . IV dose given over 2-5 minutes.

Pediatric: 0.1 mg/kg IV

Dosage Adjustment Considerations: Half dose in hepatic impairment

Standard Formulation (alternate formulations): 2 mg/ml (alternate: 4 mg/ml)

EMS Indications: Severe nausea and vomiting, including vomiting potentially related to increased intracranial pressure with intracranial hemorrhage or concussion. It is nonsedating and allows continued trending of neuro exam in these patients.

Protocols

M – 6: Poisoning / Toxic Ingestion
M - 8: Pain Management
M - 9: Nausea / Vomiting

Action

Selective serotonin blocker on vagal nerve terminals and chemoreceptor trigger zone

Adverse Effects

Serious: dose-dependent increases in ECG intervals, usually 1-2 hours following administration, leading to lethal arrhythmias including torsades

Common: headache, hypoxia

Drug Interactions

May enhance effect of other QTc prolonging agents (including haloperidol)

Administration Considerations

IV dose may be given sublingual in pediatric patients
Incompatible with Lorazepam.

Contraindications

Hypersensitivity
Caution if: QT prolongation, hypomagnesemia, hypokalemia

SODIUM BICARBONATE

Routes of Administration: Intravenous (IV)
Class: Electrolyte
Dosage Range (Maximum)
Adult 50-74 kg: 50 mEq IV; ≥ 75 kg: 75 mEq IV
Pediatric: 1 mEq/kg IV
Dosage Adjustment Considerations: None for renal or hepatic impairment
Standard Formulation (alternate formulations): 8.4% solution, 1 mEq/ml

EMS Indications: Systemic alkalinization to limit toxicity in tricyclic overdose
Adjunct in management of hyperkalemia

Protocols
MC – 4: Cardiac Arrest: Pediatric
MC – 5: Cardiac Arrest: Adult
MC – 6: Post Resuscitation Care
M – 6: Poisoning / Toxic Ingestion

Action
Systemic alkalinizing agent.

Adverse Effects
Serious: Metabolic alkalosis, tetany, hypernatremia, pulmonary edema

Administration Considerations
In tricyclic ingestion, bolus dose may be given as noted above, particularly if QRS widening is noted. QRS width should be monitored to determine if additional boluses are needed.
Medical control may elect to start a sodium bicarbonate drip following the bolus. The physician should order this specifically. Sodium bicarb should NOT be mixed in normal saline because the solution is too hyperosmotic. If D5W is not available, additional boluses may be ordered.
Sodium bicarbonate may be administered in cardiac arrest suspected due to significant hyperkalemia (i.e., in patients with renal failure who have not been dialyzed regularly or recently). Administration of bicarbonate should follow administration of calcium chloride.
Medical command may order bicarbonate administration (following calcium chloride) in suspected hyperkalemic patients who are not in arrest with ECG changes thought to be due to hyperkalemia (significantly enlarged and peaked T waves, acutely widened QRS).

Contraindications
Significant alkalosis
Hypocalcemia
Severe pulmonary edema
Hypersensitivity
Caution if: respiratory acidosis (worsens hypercapnia)

PRALIDOXIME

Routes of Administration: Intramuscular (IM) as "Duodote", combined with atropine. See **DUODOTE PROCEDURE** (P-36) also.

Class: Antidote

Dosage Range (Maximum)

Adult: Mild symptoms: 1 injection, if no severe symptoms appear in 10-15 minutes, no additional injections needed.
Severe symptoms: 3 injections in rapid succession

Pediatric: Do not use autoinjector

Dosage Adjustment Considerations: May require lower dose in renal impairment

Mild symptoms	**Severe symptoms**
Blurred vision, miosis (constricted pupils)	Strange or confused behavior
"Wet": Excessive, unexplained teary eyes Excessive, unexplained runny nose Increased salivation such as sudden drooling Increased airway secretions	Involuntary urination and defecation
Tachycardia or bradycardia	Loss of consciousness
Unexplained wheezing or coughing	Respiratory arrest
Chest tightness or difficulty breathing	Severe difficulty breathing or copious secretions from lungs/airway
Tremors throughout the body or muscular twitching	Convulsions, or severe muscular twitching and general weakness
Nausea and/or vomiting, acute onset of stomach cramps	

Standard Formulation: Duodote: Atropine 2.1 mg/0.7 ml with pralidoxime chloride 600 mg/2 ml

EMS Indications: Symptomatic organophosphate toxicity

Protocols: M6 – Poisoning / Toxic Ingestion: Adult and Pediatric

Action: Reactivates cholinesterase that was inactivated by phosphorylation by exposure to organophosphate pesticides and cholinesterase inhibiting nerve agents (such as sarin, tabun, soman). Removes the phosphoryl group from the active site of the inactivated enzyme.

Pertinent Pharmacokinetics:

Half life in poisoned patients: 3-4 hours. Time to peak serum (IM route): 35 min

Adverse Effects

Serious: Cardiac arrest, hypertension, tachycardia, apnea, laryngospasm, paralysis, seizure

Other: Nausea, decreased renal function, hyperventilation, blurred vision, fasciculations, weakness, muscle rigidity, headache

Drug Interactions: None in life-threatening organophosphate toxicity

Necessary Monitoring

Critical monitoring is required as soon as practical, but should not delay administration or place providers at risk by not properly decontaminating the patient if indicated.

Administration Considerations

Treatment should begin as soon as symptoms appear. Patients will be transported after administration.

Use with caution in patients with myasthenia gravis as it may precipitate a myasthenic crisis.

Not indicated for toxicity of organophosphates without anticholinesterase activity

May be given on standing order for self or buddy care

Contraindications

None, Pregnancy category C

PHENYLEPHRINE (Neosynephrine)

Routes of Administration: Intravenous (IV)

Class: Alpha agonist, sympathomimetic

Dosage Range

50-200 mcg (100 mcg/mL concentration) every 3-10 minutes (0.5-2 mL per dose), titrating to MAP >60.

Standard Formulation (alternate formulations): Phenylephrine 10 mg/ 1 mL

EMS Indications: Hypotension refractory to fluid administration. Hypotension with associated tachycardia. Prevention of hypotension during RSI procedure.

Protocols

MC6.2 –Advanced Post Resuscitation
P52 – Rapid Sequence Intubation

Action

Potent, selective agonist of alpha receptors. Alpha action produces arteriolar vasoconstriction.

Pertinent Pharmacokinetics

Onset of action within one minute. Duration is 3-20 minutes.

Adverse Effects

Extravasation
Hypertension
Reflex bradycardia
Anxiety
Headache
Burning
Rebound congestion
Sneezing
Pulmonary edema
Metabolic acidosis
Decreased renal perfusion
Reduced urine output
Nausea
Gastric irritation

Drug Interactions

Sympathomimetics: additive pharmacodynamic effects
MAOI, cocaine, tricyclic antidepressants: potentiate activity and risk hypertensive crisis

Administration Considerations

Preferred vasopressor for use in non-cardiac arrest patients with cardiac disease because of limited beta activation in the heart.
Take care to avoid extravasation when administering IV as it can cause severe tissue necrosis.
Phenylephrine should be mixed to a concentration of 100 mcg/mL. This is achieved by adding 10mg/1mL vial to a 100 mL IV bag. A 10 mL syringe is then used to draw up 10 mL of the 100 mcg/mL solution for push pressor dosing.
Phenylephrine is not recommended as first line vasopressor for septic shock. Use norepinephrine.

Contraindications

Hypersensitivity to phenylephrine or sulfites
Ventricular tachycardia
Closed angle glaucoma
Severe hypertension

NOREPINEPHRINE

Routes of Administration: Intravenous (IV)
Class: Sympathomimetic

Dosage Range (Maximum)

Adult Hypotension:
Initial: 5-30 mcg/min, titrate to SBP ≥ 90 mmHg or MAP ≥ 65 mmHg.

Pediatric: Hypotension:
Initial: 0.1 mcg/kg/min, titrate to SBP ≥ 70 + (pt age x 2) mmHg
Maintenance 0.05 -0.3 mcg/kg/min with a MAX of 6 mcg/min

Mixing infusion:

	Amount to add to 250 ml D5W	Solution Concentration	Equivalent Norepinephrine Concentration
Norepinephrine	4 mg	16 mcg/ml	16 mcg/ml

Dosage Adjustment Considerations: None for renal or hepatic impairment, geriatric should start at the bottom of the dosage range.

Standard Formulation (alternate formulations): 4 mg/4 ml

EMS Indications: Hypotension due to medical causes refractory to adequate fluid resuscitation, ONLY after volume repletion as per **FLUID RESUSCITATION Procedure (P-42).** May be used with physician order for suspected hypotension in PEA medical cardiac arrest after minimum 2L (adult) or 80 mg/kg (pediatric) fluid bolus.

Protocols

MC6.2 –Advanced Post Resuscitation
P52 – Rapid Sequence Intubation

Action

Alpha-adrenergic agonist, inotrope

Adverse Effects

Serious: Local extravasation leading to tissue necrosis, cardiac arrest, reflex bradycardia, arrhythmias, gangrene, severe peripheral and visceral vasoconstriction

Common: nausea, vomiting, hypersalivation, hypertension, anxiety, restlessness, weakness, urinary retention

Drug Interactions

MAOI, Tricyclic antidepressants: hypertension, increased risk of cardiac arrhythmia, tachycardia
Digoxin, Verapamil: increased risk of cardiac arrhythmia,

Administration Considerations

Titration in 0.02 mcg/kg/min increments are suggested every 1-2 min to achieve SBP or MAP goals, but larger increments may be needed

Caution:

- Norepinephrine is a pressor and should be administered through as large and central a vein as possible, where free fluid flow is noted without a pressure bag. Extreme diligence should be exercised to monitor for extravasation as it can cause significant tissue necrosis. Should extravasation occur, the infusion should be stopped and the receiving physician notified immediately so they can make a decision whether to administer the antidose (phentolamine). If an antecubital vein is used, strongly consider splinting the elbow to limit the tendency to bend and potentially crimp off the infusion. Leg veins should not be used.

If IO is used for norepinephrine infusion, humeral location is strongly preferred, both for the volume bolus and for the infusion itself.

Norepinephrine infusion line should not be used for administration of other medications, a separate medication line should be used. Particularly sodium bicarbonate should never be given through the same line.

If the concentrated norepinephrine solution contains precipitate or is brown in color, it should not be used.

Compared to dopamine:

- Norepinephrine is more effective for refractory hypotension in tricyclic overdose
- Norepinephrine produces less increase in intracranial pressure in severely head-injured patients than dopamine at the same mean arterial pressure.
- Mortality is not significantly different at 28 days between the two pressors for patients with septic shock or shock, and less patients developed dysrhythmias with norephinephrine

Contraindications

No absolute contraindications in a patient in extremis

Caution if: hypoxia or hypercarbia

ROCURONIUM

Routes of Administration: Intravenous (IV)

Class: Short Acting Non-Depolarizing skeletal muscle relaxant

Dosage Range (Maximum)

Adult 0.5-1.5 mg/kg I.V. push
Pediatric: Rocuronium is not to be administered to pediatric patients

Standard Formulation (alternate formulations): 100 mg/10 mL

EMS Indications: Facilitation of rapid sequence intubation. Ongoing maintenance of chemical paralysis.

Protocols

MC6.2 –Advanced Post Resuscitation
P52 – Rapid Sequence Intubation

Action

The agent is a non-depolarizing skeletal muscle relaxant. This agent acts by competing for cholinergic receptors which prevents acetylcholine from binding to the receptors on the muscle end plate, thus blocking depolarization and resulting in paralysis.

Pertinent Pharmacokinetics

Onset of flaccid paralysis occurs in 60-75 seconds. Single dose administration lasts 40 - 60 minutes.

Adverse Effects

Serious: Respiratory depression and apnea
As with other neuromuscular blockers, the potential for releasing histamine is present following administration. Serious histamine mediated flushing, hypotension and bronchoconstriction are, however, uncommon in normal clinical usage.
RESP: respiratory depression and apnea.
CV: transient increase in heart rate.
SKIN: rash and flushing.

Drug Interactions

Fentanyl and rocuronium are synergistic, one increasing the effect of the other.

Administration Considerations

The patient will be completely paralyzed and in respiratory arrest for at least 20 minutes following the administration of rocuronium - complete airway control and management will be necessary.
Rocuronium has no effect on consciousness, cerebration, or perception of pain. Patients must not be allowed to be conscious or receptive to pain when under the effects of a paralytic.

Contraindications

Known neuromuscular disease (relative)

TRANEXAMIC ACID (TXA)

Routes of Administration: Intravenous (IV)

Class: Antifibrinolytic Agent

Dosage Range (Maximum)

Adult 1 gram mixed into 100 mL, given over 10 minutes

Standard Formulation (alternate formulations): 500 mg/ 5 mL

EMS Indications:
- Uncontrolled hemorrhage
- Reversal of fibrinolytic therapy
- Multi-system trauma with high risk of internal bleeding
- Gastrointestinal bleeding with associated signs of shock
- Post-partum hemorrhage

Protocols

Action

Inhibits fibrinolysis by displacing plasminogen from fibrin. This results in more stable clot formation and enhances hemostasis.

Pertinent Pharmacokinetics

Peak plasma time 3 hours after administration. Half-life 2-11 hours.

Adverse Effects

- Visual abnormalities (color vision change or visual loss)
- Hypotension (with rapid injection)
- Nausea
- Vomiting
- Diarrhea
- Anaphylaxis

Drug Interactions

TXA and fibrinolytics have antagonistic mechanisms of action. TXA increases effects of factor IX and prothrombin complex.

Administration Considerations

Avoid rapid administration, as this may precipitate hypotension.

Contraindications

- Hypersensitivity

Etomidate

Routes of Administration: Intravenous (IV)

Class: General Anesthetic and adjunct to general anesthesia

Dosage Range (Maximum)

Adult 0.2-0.5 mg/kg IV

Dosage Adjustment Considerations: Per Critical Care Paramedic judgement and for safe and convenient administration of a therapeutic dose. Exact dose should be rounded to an easy to prepare and administer whole number.

Standard Formulation (alternate formulations): 40 mg/20 mL

EMS Indications: Facilitation of procedural sedation or RSI.

Protocols

P52 – Rapid Sequence Intubation

Action

Etomidate appears to facilitate GABAminergic neurotransmission by increasing the number of available GABA receptors, possibly by displacing endogenous inhibitors of GABA binding. Etomidate produces clinical responses such as hypnosis, elevations in arterial carbon dioxide tension, reduced cortisol plasma levels, and a transient 20—30% decrease in cerebral blood flow. Its effects are at least partially due to depression of the brainstem reticular formation. Etomidate also inhibits the enzymatic biosynthesis of steroid hormones, including corticosteroids.

Pertinent Pharmacokinetics

Onset of action: 10-15 seconds. Duration of action: 4-10 minutes

Adverse Effects

Skeletal muscle: Myoclonic skeletal muscle movements, tonic movements. These may easily be mistaken for seizure activity. Respiratory: Apnea of short duration, hyperventilation or hypoventilation, laryngospasm. CV: Either hypertension or hypotension; tachycardia or bradycardia; arrhythmias. GI: Postoperative N&V. Miscellaneous: Eye movements, averting movements, hiccoughs, snoring. Adrenal suppression of corticosteroids may occur after one dose and may last 4-8 hours.

Drug Interactions

Etomidate potentiates the effects of CNS depressants such as ethanol, general anesthetics, local anesthetics, antidepressants, H1-blockers, opiate agonists, skeletal muscle relaxants, phenothiazines, barbiturates, and benzodiazepines. Concurrent use of antihypertensive agents and etomidate can result in hypotension. This is particularly true if any of the following agents are used with etomidate: calcium-channel blockers, diazoxide, mecamylamine.

Administration Considerations

Profound decrease in level of consciousness and possible apnea should be anticipated. Aggressive airway management, continuous end tidal capnography and pulse oximetry should be utilized at all times surrounding administration of etomidate.

Muscle spasms and tonic movements may be seen with administration of etomidate. If you see this, don't automatically assume it is a seizure. This is a normal reaction to the medication seen in some individuals.

Contraindications

Use with caution in the elderly and in patients with hepatic disease. No absolute contraindications.

	Pediatric (Based on weight)										Adult		Geriatric
	5kg	7kg	9kg	10kg	12kg	15kg	20kg	30kg	40kg	50-74kg	≥75kg	Any weight
Adrenaline-first dose IV	0.5mg	0.7mg	0.9mg	1mg	1.2mg	1.5mg	2mg	3mg	4mg	6mg	6mg	6mg
Adrenaline-second dose IV	1mg	1.4mg	1.8mg	2mg	2.4mg	3mg	4mg	6mg	8mg	12mg	12mg	12mg
Amiodarone IV					80mg	75mg	100mg	150mg	150mg	150mg	150mg	150mg
Atropine IV	0.1mg	0.14mg	0.18mg	0.2mg	0.24mg	0.3mg	0.4mg	0.6mg	0.8mg	1mg	1mg	1mg
Calcium Chloride IV	10mg	15mg	17.5mg	20mg	25mg	30mg	40mg	60mg	80mg	100mg	1g	1g
Calcium Chloride 10% (1ml) IV	1ml	1.5ml	1.75ml	2ml	2.5ml	3ml	4ml	6ml	8ml	10ml	10ml	10ml
Cardioversion-Initial	2J	4J	5J	5J	6J	8J	10J	15J	20J	50J	50J	50J
Cardioversion-second+	4J	8J	10J	10J	12J	15J	20J	30J	40J	200J	200J	200J
Defibrillation-Initial	10J	14J	18J	20J	24J	30J	40J	60J	80J	300J	300J	300J
Defibrillation-second+	20J	28J	36J	40J	48J	60J	80J	120J	160J	300J	300J	300J
Dextrose IV	2gm	3.5gm	4.5gm	5gm	6gm	8gm	10gm	15gm	20gm	25gm	25gm	25gm
Dextrose 10% (1ml) IV	4ml	7ml	9ml	10ml	12ml	15ml	20ml	30ml	40ml	50ml	50ml	50ml
Dextrose 25% (1ml) IV					24ml	30ml	40ml	60ml	80ml			
Dextrose 10% (1ml) IV	20ml	35ml	45ml	50ml	60ml	75ml	100ml					
Diphenhydramine IV					62.5mg	62.5mg	125mg	125mg	125mg	50mg	50mg	125mg
Diphenhydramine IM					125mg	125mg	25mg	25mg	50mg	50mg	50mg	25mg

	Pediatric (Broselow codes)								Adult		Geriatric
	5kg	7kg	9kg	10kg	12kg	15kg	20kg	30kg	40kg	50-74kg	≥75kg	Any weight
Dopamine gtt (mcg/min) IV – starting dose of 5 mcg/kg/min										250 mcg/min	375 mcg/min	250 mcg/min
Epinephrine 1: 1000 SQ/IM	0.05ml	0.07ml	0.09ml	0.1ml	0.12ml	0.15ml	0.2ml	0.3ml	0.4ml	0.5ml	0.5ml	0.5ml
Epinephrine 1:10,000 IV	0.05mg	0.07mg	0.09mg	0.1mg	0.12mg	0.15mg	0.2mg	0.3mg	0.4mg	1mg	1mg	1mg
Epinephrine 1:10,000 (ml) IV	0.5ml	0.7ml	0.9ml	1ml	1.2ml	1.5ml	2ml	3ml	4ml	10ml	10ml	10ml
Epinephrine gtt (mcg/min) IV – starting dose of 0.1 mcg/kg/min	0.5 mcg/min	0.7 mcg/min	0.9 mcg/min	1 mcg/min	1.2 mcg/min	1.5 mcg/min	2 mcg/min	3 mcg/min	4 mcg/min			
Mix 4 mg/ml Epinephrine drip by adding 0.6 mg of Epinephrine to 150 ml bag												
Epinephrine 4 mg/ml gtt (gtt/min) IV – 0.1 mcg/kg/min on 60 gtt/ml set STARTING dose	8 gtt/min	11 gtt/min	14 gtt/min	15 gtt/min	18 gtt/min	23 gtt/min	30 gtt/min	45 gtt/min	60 gtt/min			
Epinephrine 4 mg/ml gtt (gtt/min) IV – 0.5 mcg/kg/min on 60 gtt/ml set MAX dose	40 gtt/min	55 gtt/min	70 gtt/min	75 gtt/min	90 gtt/min	115 gtt/min	150 gtt/min	225 gtt/min	300 gtt/min			
Fentanyl IV / IM				10mcg	10mcg	15mcg	20mcg	25mcg	25mcg	50mcg	75mcg	25mcg
Fentanyl IN	10mcg	15mcg	20mcg	20mcg	25mcg	30mcg	40mcg	50mcg	50mcg	100mcg	100mcg	50mcg
Glucagon IM/ IN	0.5mg	0.5mg	0.5mg	0.5mg	0.5mg	0.5mg	1mg	1mg	1mg	1mg	1mg	1mg
Glucagon IV (for POISONING only)	0.6mg			0.7mg	0.8mg	1mg	1.5mg	2mg	3mg	4mg	4mg	4mg
Haloperidol IV	2.5mg								25mg	5mg	5mg	25mg
Haloperidol IM	5mg								5mg	10mg	10mg	5mg
Hydroxocobalamin IV	350mg	500mg	630mg	700mg	830mg	1050mg	1400mg	2100mg	2800mg	5g	5g	5g

	Pediatric (Broselow colors)									Adult		Geriatric
	5kg	7kg	9kg	10kg	12kg	15kg	20kg	30kg	40kg	50-74kg	≥75kg	Any weight
Lidocaine 2% (for IO PAIN only) First dose	2mg	4mg	5mg	5mg	6mg	8mg	10mg	15mg	20mg	40mg	40mg	40mg
Lidocaine 2% (for IO PAIN only) Second and following doses	1mg	2mg	3mg	3mg	3mg	4mg	5mg	8mg	10mg	20mg	20mg	20mg
Lorazepam IV/IM				0.5mg	0.6mg	0.75mg	1mg	1.5mg	2mg	2mg	2mg	1mg
Magnesium Sulfate IV								750mg	1g	2g	2g	1g
Magnesium Sulfate 10% IV (ml)								7.5ml	10ml	20ml	20ml	10ml
Magnesium Sulfate 50% IV (ml)								1.5ml	2ml	4ml	4ml	2ml
Methylprednisolone	10mg	14mg	18mg	20mg	24mg	30mg	40mg	62.5mg	80mg	125mg	125mg	125mg
Midazolam IM				1mg	12mg	15mg	2mg	3mg	4mg	5mg	10mg	5mg
Midazolam IN	1mg	1.5mg	2mg	2mg	2.5mg	3mg	4mg	6mg	8mg	10mg	20mg	10mg
Morphine IV/IM	0.5mg	0.7mg	1mg	1mg	1.25mg	1.5mg	2mg	3mg	4mg	4mg	6mg	2mg
Naloxone IV/IM/IN	0.5mg	0.7mg	1mg	1mg	1.2mg	1.5mg	2mg	2mg	2mg	2mg	2mg	2mg
Ondansetron IV							2mg	3mg	4mg	4mg	4mg	4mg
Prednisone PO							20mg	20mg	40mg	60mg	60mg	60mg
Sodium Bicarbonate IV				10mEq	12mEq	15mEq	20mEq	30mEq	40mEq	50mEq	75mEq	50mEq
Sodium Bicarbonate IV (ml)				10ml	12ml	15ml	20ml	30ml	40ml	50ml	75ml	50ml
Normal Saline Module (20ml/kg)	100ml	140ml	180ml	200ml	240ml	300ml	400ml	600ml	800ml	2L	2L	1L

MEDICATION SCOPE BY PROVIDER

Key:

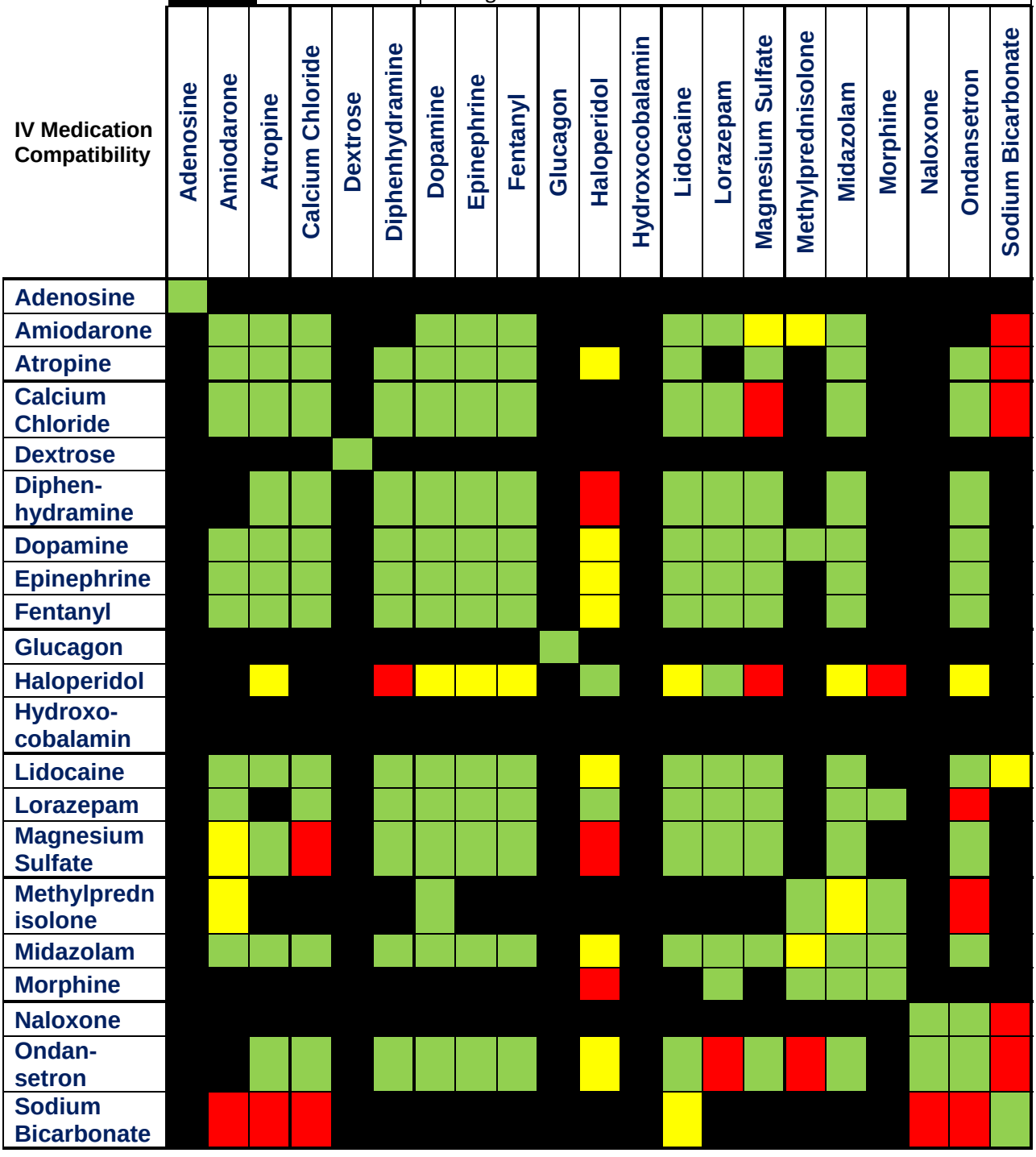
	Not permitted
SO	Standing order only if indicated by specific protocol
MD	MD order only--should only be requested if it is also appropriate within protocol for MICTs

	EMT	AEMT	MICT
Activated charcoal PO	SO	SO	SO
Adenosine IV			SO
Albuterol nebulization solution	SO	SO	SO
Amiodarone IV (V Fib Only)		SO	SO
Amiodarone IV (in non-cardiac arrest)			SO
Aspirin PO	SO	SO	SO
Atropine IM (Mark 1 or Duodote Only)	SO	SO	SO
Atropine IV			SO
Calcium Chloride 10% IV			SO
Dextrose IV		SO	SO
Diphenhydramine IV		SO	SO
Dopamine (Monitor IV drip in transit only)		MD	SO
Dopamine IV drip premix			SO
Epinephrine 1:1,000 (IM via Epi Pen only)	SO	SO	SO
Epinephrine 1:1,000 IM			SO
Epinephrine 1:10,000 IV (cardiac arrest)		SO	SO
Epinephrine 1:10,000 IV (non cardiac arrest)			MD
Fentanyl		SO	SO
Morphine			
Glucagon (autoinjector only)	SO	SO	SO
Glucagon IM		SO	SO
Glucose PO	SO	SO	SO
Haloperidol IV / IM			SO
Hydroxocobalamin IV (Cyanokit)			SO
Ipratropium nebulization solution		SO	SO

	EMT	AEMT	MICT
Lidocaine			SO
Lorazepam (backup, only when Midazolam unavailable)		MD	SO
Magnesium Sulfate			SO
Methylprednisolone IV			SO
Midazolam		MD	SO
Morphine (backup, only when Fentanyl unavailable)		SO	SO
Naloxone		SO	SO
Nitroglycerin SL	SO	SO	SO
Nitroglycerin paste transdermal			SO
Normal Saline IV		SO	SO
Ondansetron IV			SO
Oral Analgesics (Direct physician order only) (for DMSU / SWAT)			MD
Over the Counter Medicines (Direct physician order only) (for DMSU / SWAT)			MD
Pralidoxime (Mark 1 or Duodote Only) IV	SO	SO	SO
Prednisone PO			SO
Sodium Bicarbonate 8.4% IV			SO

Key:

	Compatible	May give in same syringe or same line without flush
	Variable	DO NOT give in same syringe. Avoid giving through same line. Flush at least 20 cc between meds.
	Incompatible	DO NOT give through same syringe or line. In emergency, may give with thorough line flush (> 20 cc) between meds.
	Not tested	Unknown. DO NOT give in same syringe. Avoid giving through same line.



DEFINITION OF A PATIENT R – 1

REFERENCE Effective 7-1-2012

Rationale:

To define who is considered a patient in the Wichita-Sedgwick County EMS System.

Definition:

A patient is a human being in any of the following situations:

- with a complaint which suggests potential for medical, traumatic, or psychiatric illness, who requests or whom another individual in direct contact with them requests evaluation for such a complaint on their behalf.
- with obvious evidence of medical, traumatic, or psychiatric illness, who has experienced an acute event that could reasonably lead to medical, traumatic, or psychiatric illness,
- in a circumstance that could reasonably lead to medical, traumatic, or psychiatric illness.

This definition is to be applied in the broadest sense. If there is any question, the individual should be considered a patient and treated accordingly. Medical alarms (i.e. fall out of wheelchair, etc) are considered patients.

Expectation:

- All patients will be assessed by an EMS provider in WSC EMSS.
- Patient care documentation will reflect assessment of all human beings who meet the definition of “patient” above.
- If an individual is evaluated and ultimately determined not to meet the definition of “patient”, the evaluation and description of the situation that supports this determination will be captured in patient care documentation.
- Any patient will be offered appropriate evaluation, treatment, and transport to an emergency department.

Documentation:

- The only time that “cancelled”, “other” or “no patient found” will be used for run disposition is if there is no patient as defined in this reference.

Rationale: To provide guidance on preferred communication methods to assure timely and accurate sharing of patient care information in verbal form, particularly for time critical illness (TCI). Consistency in format and content of verbal communications promotes better transfer of information among providers and better teamwork, both of which are in the best interest of quality, safe patient care.

Background:

The goal of radio / verbal report communication is to provide essential information in an easily understandable, consistent format. Using a consistent format assures that the listener is prepared and so that vital information is not lost and appropriate resources can be provided to the patient as required by their condition. Written patient care communication is covered in **PATIENT CARE DOCUMENTATION (P-2)**. Inclusion of unnecessary information, particularly in verbal communication, makes it more difficult for the listener to discern the critical information. The information contained in this procedure is consistent with the SCEMS Communication and Documentation Academy (March 2011).

The most important elements to providing a quality verbal report are:

- Do an appropriate history and physical assessment of the patient
- Decide on a specific course of action based on your assessment
- STOP and collect your thoughts on what is pertinent and critical
- Then communicate to other health care team members the critical components of your assessment and decision-making in a way that promotes continuity of patient care and appropriate responses to the patient's needs.

Indications:

Every patient shall have an appropriate verbal report of EMS assessment and care provided every time there is a transfer of patient care to another provider, or another provider joins the care team. This includes transfer of information from the first responder to the transport provider as well as from the transport provider to the hospital staff (via radio and in person).

Necessary Equipment

Method of communicating with hospitals: radio or phone

Procedure:

Alerts:

For time-critical illness (stroke, STEMI, trauma), the earlier the receiving facility can be notified, the better. This is most critical with STEMI, where a team of personnel may need to be brought in from home to prepare for the patient's arrival. As a result, as soon as the patient is identified as having a TCI, the receiving facility should be notified via dispatch so they can activate the appropriate response internally.

It is more important for the facility to know a patient with TCI is coming than it is for the patient to have "everything" done (i.e. IV, etc) before the call. You can do those things in transit.

The EMS communication should be that this is an **EMS** alert. If multiple patients, early alert of total number is important.

Prealerts via dispatch should include:

For all patients: Age / sex, ETA, GCS or AVPU, triage level, hospital destination

Trauma / Burn **EMS** alert:

Mechanism of injury (i.e. high speed MVC, thermal burn with inhalation)

Stroke **EMS** alert:

Time last seen normal

STEMI **EMS** alert:

Whether patient has cardiologist and if Via Christi clinic patient

Radio Report:

Each radio report to the ED should begin with:

- Medic unit number
- Provider's name
- Triage level (specify if trauma), i.e. "code yellow trauma"
- Patient chief complaint
- Patient age / sex

Triage Red or Yellow patient (limit to 30-45 seconds total):

- Request physician if needed for orders (before giving remainder of report to avoid repeating)
- Initial vital signs with oxygen saturation and EtCO2 if applicable
- Pertinent history / exam findings (mechanism of injury for trauma) and patient LOC
- Treatment summary including medications given and response to treatment
- Any pertinent change in vital signs
- Patient initials / DOB if asked
- ETA to hospital
- For STEMI: include 12-lead findings, pain level and change with treatment, whether ASA given
- For stroke: include last time seen normal, blood glucose, which new positive findings on stroke scale
- For trauma: GCS or AVPU scale

Triage Green patient:

- Vital signs only if abnormal
- Whether patient ok for triage

Triage Blue patient:

- Pertinent history
- Downtime / last seen, witnessed?
- Bystander CPR?
- # shocks (AED / LP)—was an initial shock advised on AED?
- Initial and current rhythm and any changes for > 5 minutes
- EtCO2 reading
- Meds / treatment summary and response
- Initials / DOB if asked

Interfacility transfer:

- Reason for transfer
- Unit accepting patient if known
- Vital signs if abnormal
- Initials / DOB if asked

Medication order requested from physician: Any orders requested, request EXACTLY what you want to give:

- Medication name (use generic name, not trade name)
- Medication dose
- Medication route and time to administer
- Medication indication
- Example: Fentanyl 50 micrograms IV slow push for pain due to suspected hip fracture
- For any orders given by physician, repeat back order to confirm

Verbal Report: to be given from first responder to transport provider or transport provider to hospital at bedside

- Provider's name and level (i.e. John, EMT) and unit number (Squad 37)
- Triage level
- Patient chief complaint
- Patient age / sex
- Pertinent history (i.e.: restrained driver of highspeed rollover, ambulatory on scene)
- Pertinent exam findings
  - initial vital signs, mental status and cardiac rhythm incl. shock/no shock on AED, if applicable
  - pertinent physical exam
- Assessment (i.e. chest injury due to MVC without evidence of respiratory distress)
- Treatment provided and any change noted with treatment
  - All medications
  - All interventions (immobilization, etc)

Considerations:

Note items that are missing from the radio report templates that providers should stop doing:

- "Do you have further questions or orders?"—If they have questions, they will ask.
- Giving medication lists and allergies unless immediately pertinent to the patient's acute complaint or requested orders

Additional Information:

Use Law Enforcement Phonetic alphabet for letters given verbally in order to be consistent and clear.

Law Enforcement Phonetic			
A - Adam	H - Henry	N - Nora	U - Union
B - Boy	I - Ida	O - Ocean	V - Victor
C - Charlie	J - John	P - Paul	W - William
D - David	K - King	Q - Queen	X - Xray
E - Edward	L - Lincoln	R - Robert	Y - Young
F - Frank	M - Mary	S - Sam	Z - Zebra
G - George		T - Tom	

A

AAA	abdominal aortic aneurysm
Ab	abortion
ACS	acute coronary syndrome
ADD	attention deficit disorder
AED	automated external defibrillator
AF	atrial flutter
AIC	attendant in charge
AICD	automatic implantable cardioverter defibrillator
AIVR	accelerated idioventricular rhythm
ALS	advanced life support
Ant	anterior
APGAR	appearance, pulse, grimace, activity, respiratory effort (scale)
A&O	alert and oriented (include what to—PPTE)
Abd	abdomen
ABC	airway, breathing, circulation
ACE	angiotensin converting enzyme
Afib	atrial fibrillation
AKA	above knee amputation
AIDS	acquired immunodeficiency syndrome
AMI	acute myocardial infarction
APS	adult protective services
ASA	acetylsalicylic acid (aspirin)
AV	atrioventricular
AVM	arteriovenous malformation
AVR	aortic valve replacement

B

BBB	bundle branch block
Bid	twice daily
BiPAP	bilevel positive airway pressure
BLS	basic life support
BP	blood pressure
BBS	bilateral breath sounds
BG	blood glucose
BKA	below knee amputation
BM	bowel movement
BS	breath sounds OR bowel sounds
BVM	bag valve mask

C

Ca++	calcium
CAD	Coronary artery disease
CC	chief complaint
CA	carcinoma, cancer
CAD	coronary artery disease
CBC	complete blood count
CABG	coronary artery bypass graft
CBT	combitube
cc	cubic centimeter
CCR	Cardio cerebral resuscitation
CCU	coronary OR critical care unit
CHF	congestive heart failure
CHI	closed head injury
CID	cervical immobilization device
Cm	centimeter
CNS	central nervous system
c/o	complains of
CO	Carbon Monoxide
COPD	chronic obstructive pulmonary disease
CO2	carbon dioxide
CPAP	continuous positive airway pressure
CPS	child protective services
CSF	cerebrospinal fluid
Cspine	cervical spine
CVA	cerebrovascular accident

D

D5W	Dextrose 5% in water
D10	10% Dextrose solution
D25	25% Dextrose solution
D50	50% Dextrose solution
DCAP BTLS	Deformities, contusions, abrasions, penetrations, paradoxical movement, burns, tenderness, lacerations, swelling
Diff	difficulty
DKA	diabetic ketoacidosis
DNAR	did not attempt resuscitation
DNI	Do not intubate
DNR	Do not resuscitate
DOB	Date of birth
DOS	Dead on scene
DT's	Delirium tremens
DVT	Deep vein thrombosis

E

ECG	Electrocardiogram
EEG	Electroencephalogram

EDC	Estimated date of confinement
Epi	Epinephrine
ER/ED	Emergency room/department
Est	Estimated
ETA	Estimated time of arrival
EtCO2	End-tidal carbon dioxide
ET	Endotracheal
ETOH	Ethyl alcohol
ETT	Endotracheal Tube
EXT	extremity

F

F	Female
F°	Fahrenheit
FBAO	Foreign body airway obstruction
FHR	Fetal Heart Rate
Fr	French
Fx	fracture

G

G +#	Gravida (G3, G4 etc)
GCS	Glasgow coma scale/score
GERD	Gastroesophageal reflux disease
GI	Gastrointestinal
Gm, g	Gram
Gtts	drops
GU	Genitourinary
GYN	Gynecology

H

h,hr	Hour
H/A	Headache
HAV	Hepatitis A virus
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HCTZ	Hydrochlorothiazide
HEENT	Head, eyes, ears, nose, throat
Hg	Mercury
H&H	Hemoglobin and hematocrit
HIV+	Human immunodeficiency virus
HR	heart rate
HRT	Hormone replacement therapy
hs	at bedtime
HTN	Hypertension
Hx	History

ICD	Implanted cardioverter defibrillator
ICP	Intracranial pressure
ICU	Intensive care unit
IDDM	Insulin dependent diabetes mellitus (Type I)
IM	intramuscular
IN	intranasal
IPPB	Intermittent positive pressure breathing
IV	Intravenous
IVR	Idioventricular rhythm

J

J	Joules
JVD	Jugular venous distension

K

K+	Potassium
KED	Kendrick extrication device
KG	kilogram
KVO	keep vein open

L

L	left or Liter
L&D	Labor and delivery
Lac	laceration
LAD	left anterior descending
LBS	pounds
LBBB	left bundle branch block
LGL	Lown-Ganong-Levine syndrome
Liq	liquid
LLQ	Left lower quadrant
LMA	laryngeal mask
LMP	last menstrual period
LOC	level / loss of consciousness
Lpm	liters per minute
LR	Lactated Ringer's
LSB	long spine board
LSD	lysergic acid diethylamide
LUQ	left upper quadrant
LVAD	left ventricular assist device
LVH	left ventricular hypertrophy

M

m	meter
M	male
mA	milliamperes
mg	milligram
MAE	moves all extremities

MAP mean arterial pressure
mcg microgram
MDC Medical Director Consult
MDI metered dose inhaler
mcl mid clavicular line
mEq milliequivalent
mL milliliter
mm millimeter
MMR measles, mumps, rubella
MOI mechanism of injury
MPH miles per hour
MS multiple sclerosis
MVA motor vehicle accident
MVC motor vehicle crash
MVP mitral valve prolapsed
MVR mitral valve replacement

N

Na+ Sodium
NAD no apparent / acute distress
N/C nasal canula
NES non-English speaking
NGT nasogastric tube
NICU neonatal / neurological intensive care
NIDDM non insulin dependent diabetes mellitus (type II)
NKA no known allergies
NKDA no known drug allergies
NMB neuromuscular blockade
NOI no obvious injury/nature of illness
NPA nasopharyngeal airway
NPO nothing by mouth
NRB non-rebreather mask
NS normal saline
NSAID non-steroidal anti-inflammatory drug
NT nasaotracheal
NTG Nitroglycerin
N/V/D nausea/vomiting/diarrhea

O

O2 Oxygen
OB obstetrics
OBS organic brain syndrome
OD Overdose, right eye (oculus dexter)
OGT orogastric tube
OOH out of hospital
OPA oropharyngeal airway
OPP Organophosphate poisoning
OPQRST pain assessment – onset, provocation, quality, radiation, severity, time
OS left eye (oculus sinister)
OR operating room
Oz. ounce

P

p.c. after meals
P +# parity (P3, P4…)
PA physicians assistant
PCP primary care physician, phencyclidine
PE physical exam, pulmonary emboli, pulmonary edema
PEA pulseless electrical activity
PEEP positive end expiratory pressure
PERRL pupils equal round reactive to light
PICU pediatric intensive care unit
PID pelvic inflammatory disease
PO by mouth
POC Position of comfort
Post. Posterior
PRN as needed
PSVT paroxysmal supraventricular tachycardia
Pt patient
PTA prior to arrival
PVC premature ventricular contraction
P/W/D pink, warm, dry

Q

Q every
Qh every hour
q.i.d. 4 times a day

R

R right
RAD reactive airway disease, right axis deviation
RBBB right bundle branch block
RBC red blood cell /count
RCA right coronary artery
RLQ right lower quadrant
ROSC return of spontaneous circulation
+ROM positive range of motion
RN registered nurse

RR respiratory rate
RSV respiratory syncytial virus
RUQ right upper quadrant
Rx prescription

S

s/s signs / symptoms
SaO2 oxygen saturation of arterial oxyhemoglobin
SARS severe acute respiratory syndrome
SBP systolic blood pressure
SC, SQ subcutaneous
SCI spinal cord injury
SCUBA self contained underwater breathing apparatus
SIDS sudden infant death syndrome
SL sublingual, saline lock
SOB shortness of breath
SROM spontaneous rupture of membranes
STD sexually transmitted disease
SUV sport utility vehicle
SVT supraventricular tachycardia
Sx symptoms

T

T spine thoracic spine
TBI traumatic brain injury
Temp temperature
Tab tablet
TB tuberculosis
TBI traumatic brain injury
Tbsp tablespoon
TCP transcutaneous pacing
TCA tricyclic antidepressant
TIA Transient ischemic attack
t.i.d three times a day
TKO to keep open
tsp teaspoon
Tx treatment

U

UA urinanalysis
URI upper respiratory infection
UTI urinary tract infection

V

VOL volume
VO verbal order
VF ventricular fibrillation
VS vital signs
Vt tidal volume
VT ventricular tachycardia

W

w/ with
w/o without
WDWN well developed, well nourished
WNL within normal limits
WPW Wolff-Parkinson-White

X / Y

X-fer transfer
X-port transport
Y/o years old

ACCEPTABLE SYMBOLS

α alpha
β beta
@ at
? possible, questionable
1° first degree
2° second degree
3° third degree
X times
Δ delta (change)
+ positive
- negative
= equal
≠ not equal to
≈ approximately
↓ Decreased, lower, below
↑ increased, upper, elevated
number

Pediatric Vital Sign Reference

Source: Pediatric Advanced Life Support Provider Manual, American Heart Association, 2006.

Respiratory Rate

Age	Respiratory Rate
Infant (< 1 yr)	30-60
Toddler (1-3 yr)	24-40
Preschooler (4-5 yr)	22-34
School age (6-12)	18-30
Adolescent (13-18)	12-16

Pulse

Age	Pulse
Newborn – 3 months	85-205
3 months – 2 yr	100-190
2 yr – 10 yr	60-140
> 10 yr	60-100

Blood Pressure

Age	Systolic	Diastolic
1 day	60-76	30-45
4 days	67-84	35-53
1 month	73-94	36-56
3 months	78-103	44-65
6 months	82-105	46-68
1 year	67-104	20-60
2 years	70-106	25-65
7 years	79-115	38-78
15 years	93-131	45-85

Definition of Systolic Hypotension

Age	SBP
0-28 days	< 60
1-12 months	< 70
1 yr – 10 yr	< 70 + (age in years x 2)
> 10 yr	< 90

Mini Mental Status Exam		
1	Orientation to time – weekday, date, season, month, year	1 point each (total 5)
2	Orientation to place – building, street, city, state, county	1 point each (total 5)
3	Say “boy, dog, ball” and have them repeat it (1 second to repeat each)	1 point each (total 3)
4	Spell “world” backward, or do serial 3’s backward from 20 (20, 17, 14, 11, 8)	1 point each (total 5)
5	Without repeating the words, ask them to repeat the previous 3 words from #3	1 point each (total 3)
6	Ask the patient to do the following after you have completed the 3 step command “stick out your tongue and touch your right hand to your left ear”	1 point each (total 3)
7	Point to your pen and watch and ask the patient what each is called	1 point each (total 2)
8	Ask the patient to read the following sentence and then do as it says: “shut your eyes”	1 point
9	Ask the patient to write a sentence.	1 point
10	Ask the patient to draw two overlapping pentagons (show them an example)	1 point
	TOTAL	Over 21 is considered competent

MEDICAL DIRECTOR AUTHORIZATION R – 17

REFERENCE Effective 11-1-2012

Rationale: To provide specific medical authorization for patient care to EMS providers currently certified by the Kansas Board of Emergency Medical Services who are acting in their official capacity as members of agencies of the Wichita-Sedgwick County EMS System. Patient care provided under these protocols and within the provider's scope of practice and System credentialing level shall be considered as use of standing physician orders for care of individual patients as specified in Kansas Statute and Board of EMS regulation. Within the Wichita-Sedgwick County EMS System, these protocols are to be construed as standing orders for patient care authorized by Sabina Braithwaite, MD, MPH, Kansas License 04-34617. Treatments and interventions that may be indicated for patient care but are not included or covered in these protocols require specific physician orders by Medical Command before being implemented.

Responsibilities:

EMS System Medical Director: will provide oversight to assure that EMS providers are competent to employ these protocols. Medical Director will advocate with the Medical Society for patient care protocols that maintain medical care in Sedgwick County at the highest level possible.

Agency Administrators and Chiefs: will assure through education and quality assurance measures that EMS providers are prepared to competently apply these protocols. They will also provide feedback on trends within their organization and the EMS system to appropriate committees when requested to assure the protocols remain an effective patient care tool.

Physician Advisory Committee of the Medical Society of Sedgwick County: Will review the medical protocols at appropriate intervals, consider and act on recommendations from the EMS System Medical Director and the physician community to modify protocols in order to maintain current patient care practices.

Considerations:

All interventions included in these protocols (including those which require specific medical command orders under normal circumstances) within the provider's scope of practice and System credentialing level may be utilized as standing orders in the following situations only:

- In case of a Mass Casualty Incidents in which resources are overwhelmed and the Medical Director is so advised by the duty Medic Captain.
- In case of a disaster (natural or otherwise) that disables standard communication methods

Sabina A. Braithwaite, MD, MPH
Wichita-Sedgwick County EMS System Medical Director

John McMaster, MD
Chair, Medical Society of Sedgwick County Physician Advisory Council

Thrombolysis in Myocardial Infarction (TIMI) Risk Scoring Prediction Tool for patients with unstable angina and non-ST elevation MI		
1	Age ≥ 65 years	1 point
2	≥ 3 CAD risk factors • Family history of CAD • Hypertension • Hypercholesterolemia • Diabetes • Current smoker	1 point
3	Known CAD (≥ 50% stenosis)	1 point
4	≥ 2 anginal episodes in prior 24 hours	1 point
5	Aspirin use in last 7 days	1 point
6	ST deviation (elevation or depression) ≥ 0.5 mm • High risk: ST	1 point
7	Elevated cardiac markers (CKMB or cardiac-specific troponin)	1 point

Total TIMI Score	Risk of ≥ 1 endpoint (new MI, recurrent MI, or need for urgent revascularization) in ≤ 14 days	Risk Status
0-1	5%	Low
2	8%	
3	13%	Intermediate
4	20%	
5	26%	High
6-7	41%	

From: Antman EM, Cohen m, Bernink PJLM, et al. 2000. The TIMI Risk Score for Unstable Angina / Non-ST Elevation MI: A Method for Prognostication and Therapeutic Decision Making. JAMA 284(7):835-842.

A	Age over 75	1 point
C	Congestive heart failure history	1 point
H	Hematocrit < 30%	1 point
E	ECG abnormal (non-sinus rhythm, or new changes)	1 point
S	Shortness of breath	1 point
S	Systolic BP <90mmHg	1 point
	Any score ≥ 1 is <u>high risk</u> for any of the following serious outcomes to occur within 7 days: • death, • myocardial infarction, • arrhythmia, • pulmonary embolism, • stroke, • subarachnoid hemorrhage, • significant hemorrhage, • any cause of repeat ED visit or hospitalization, or • acute intervention that would require admission (i.e. pacemaker, ruptured AAA, etc)	

From:
Martin TP, Hanusa BH, Kapoor WN. 1997. Risk stratification of patients with syncope. Ann Emerg Med 29(7):459-66.

<u>Note</u>: This is the San Francisco Syncope Rule (CHESS) with the addition of age criteria to be more conservative. The San Francisco Syncope Rule has a sensitivity of 96%, and a specificity of 62%. Addition of the age criterion raises sensitivity to 100%, decreases specificity to 44%.

This rule was created to assist in predicting the need for hospital admission and was not designed as an EMS tool. Lacking an EMS-specific tool, this rule at least provides some specific information that providers can share with patients as to their risk of having a serious outcome (as noted in the chart above) if they refuse treatment and transport. Should they still refuse, it should serve to encourage them to seek medical evaluation promptly.

LEFT VENTRICULAR ASSIST DEVICE R – 20

REFERENCE Effective11-1-2012

Rationale: To provide specific guidance on management of various types of left ventricular assist devices that patients in the community may have implanted, as management of cardiac arrest or arrhythmias may vary from the standard. The only local patient that has self-identified has a HeartMate II.

Indications: Patient with LVAD devices who have LVAD-related or cardiac complaints that may require CPR, defibrillation, or better understanding of whether patient should be expected to have palpable pulses, audible cardiac activity and other exam findings that may not be the same as in patients without LVAD.

Procedure:

1. Assess patient using **PATIENT ASSESSMENT Protocols (A-1, A-2).**
2. Auscultate heart sounds to determine if device is functioning. A functioning continuous flow device should create a "whirling" sound.
3. Assess device for any alarms
4. Look on controller around patient's waist for tag color, device type, name of institution that placed the device, and the contact number.

5. Match device tag color to appropriate information in this reference. Call number on device if needed for advice on hospital destination.
6. Bring all of patient's equipment and significant other with patient to hospital.

FAQs

What is a Ventricular Assist Device (VAD)? A ventricular assist device (VAD) is a mechanical pump that's used to support heart function in people who have weakened hearts.
How does a VAD work? The device takes blood from a lower chamber of the heart and helps pump it to the body and vital organs, just as a healthy heart would.
What are the parts of a VAD? The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver the blood to your body; and a power source.
What is the power source? The power source is either batteries or AC power. The power source is connected to a control unit that monitors the VAD's functions. The batteries are carried in a case usually located in a holster in a vest wrapped around the patient's shoulders.
What does the control unit or controller do? The control unit gives warnings, or alarms, if the power is low or if it senses that the device isn't working right. It is a computer.

Source: Mechanical Circulatory Support Organization, January 2012. **Note there are some grammar and spelling errors in the information copied from this document**
http://www.mylvad.com/assets/ems_docs/00003528-2012-field-guide.pdf

HEARTMATE II (ORANGE TAG)

1. **Can I do external CPR?**
   Only if absolutely necessary
2. **If not, is there a "hand pump" or external device to use?**
   No.
3. **If the device slows down (low flow state), what alarms will go off?**
   A red heart alarm light indicator and steady audio alarm will sound if less than 2.5 lmp. Can give a bolus of normal saline and transport to an LVAD center.
4. **How can I speed up the rate of the device?**
   No, it is a fixed speed.
5. **Do I need to heparinize the patient if it slows down?**
   Usually no, but you will need to check with implanting center.
6. **Can the patient be defibrillated while connected to the device?**
   Yes.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   No.
8. **Does the patient have a pulse with this device?**
   May have weak pulse or lack of palpable pulse.
9. **What are acceptable vital sign parameters?**
   MAP 70 - 90 mm Hg with a narrow pulse pressure
10. **Can this patient be externally paced?**
    Yes.

FAQs

- May not be able to obtain cuff pressure (continuos flow pump).
- Pump connected to electric line exiting patient's abdominal area and is attached to computer which runs the pump.
- Pump does not affect EKG
- All ACLS drugs may be given.
- No hand pump is available.
- A set of black batteries last approximately 3 hours, gray batteries last 8-10 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring **ALL** of the patient's equipment with them.

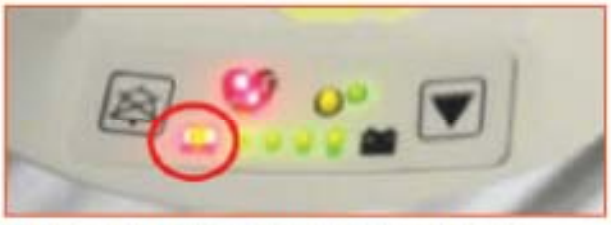
Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

Trouble Shooting HeartMate II®

When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. *(see changing batteries section on next page)*
- If pump does not restart, change controllers. *(see changing controllers section on next page)*

Alarms: Emergency Procedures



Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.

HEARTMATE II (ORANGE TAG)

Changing Batteries

WARNING: At least one power lead must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 3 and 4)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 1)
- Controller will start beeping and flashing green signals.
- Replace with new battery by lining up RED arrows on battery and clip. (Figure 2)
- Slide a new, fully-charged battery (Figure 4) into the empty battery clip by aligning the RED arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and green flashing will stop.
- Repeat previous steps with the second battery and battery clip.


Figure 1


Figure 2


Figure 3


Figure 4

Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the RED arrows. **ALARMS WILL SOUND-THIS IS OK.**

- Depress the silence alarm button (upside-down bell with circle) until the alarm is silenced on the new, replacement Controller.
- Rotate the perc lock on the replacement controller in the direction of the "unlocked" icon until the perc lock clicks into the fully- unlocked position. Repeat this same step for the original Controller until the perc lock clicks into the unlocked position.

- Disconnect the perc lead/driveline from the original controller by pressing the metal release tab on the connector socket. The pump will stop and an alarm will sound.

Note: The alarm will continue until power is removed from the original Controller. ***Getting the replacement Controller connected and the pump restarted is the first priority.***

- Connect the replacement Controller by aligning the BLACK LINES on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.

Step 2. Check the powersource to assure that power is going to the controller.

Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.

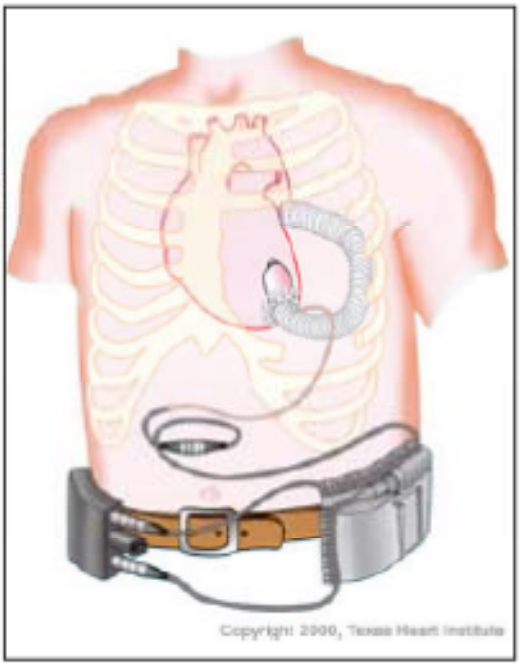
- After the pump restarts, rotate the perc lock on the new controller in the direction of the "locked" icon until the perc lock clicks into the fully-locked position. If unable to engage perc lock to the locked position, gently push the driveline into the controller to assure a proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.

JANUARY 2012

JARVIK 2000 FLOWMAKER (LAVENDER TAG)

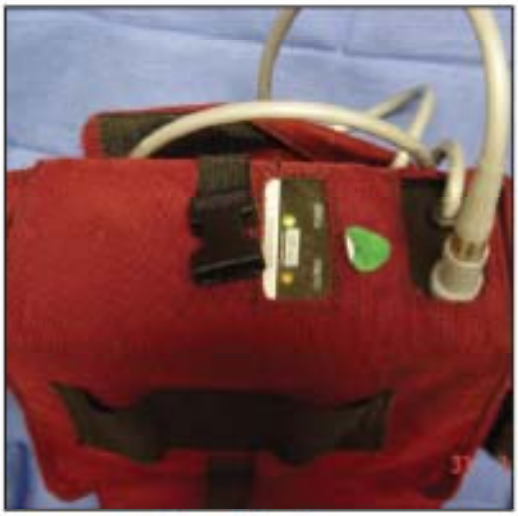
1. **Can I do external CPR?**
   Yes.
2. **If not, is there a "hand pump" or external device to use?**
   No.
3. **If the device slows down (low flow state), what alarms will go off?**
   The Underspeed indicator light. If the pump is stopped you will hear a steady alarm and the pump stopped symbol will light up red. This symbol is shaped like a stop sign with a bell in it.. See next page for symbols and locations. Change to a fully charged battery or change from the reserve battery to the L-ion battery.
4. **How can I speed up the rate of the device?**
   Jarvik has an indicator dial usually at a speed set at 3.
5. **Do I need to heparinize the patient if it slows down?**
   No.
6. **Can the patient be defibrillated while connected to the device?**
   Yes.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   No.
8. **Does the patient have a pulse with this device?**
   Yes. Palpable pulse depends on ventricular contractility, preload and afterload.
9. **What are acceptable vital sign parameters?**
   Jarvik suggest MAP 65 - 75mm Hg.
10. **Can this patient be externally paced?**
    Yes.

-- All ACLS medications can be administered.
-- The Li-Ion battery can provide up to 10 hours of power when fully charged.
-- When switching to the reserve battery be sure to follow the color coding of the cables



Jarvik 2000 FlowMaker® system

Controller attached to the protable Li-ion battery.

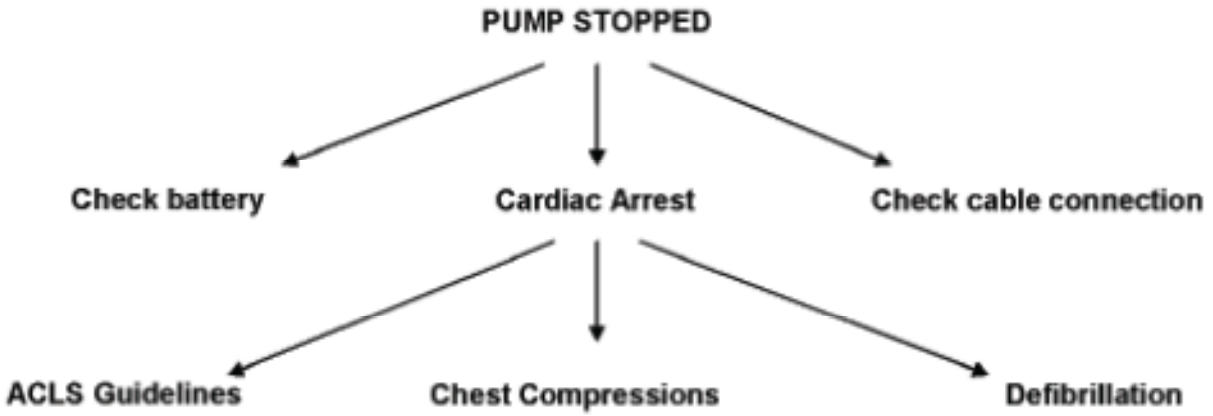


Reserve Battery Pack

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press. This guide does not supersede manufacturer instructions. Copy with permission only: March 2009 Jarvik 2000 FlowMaker®

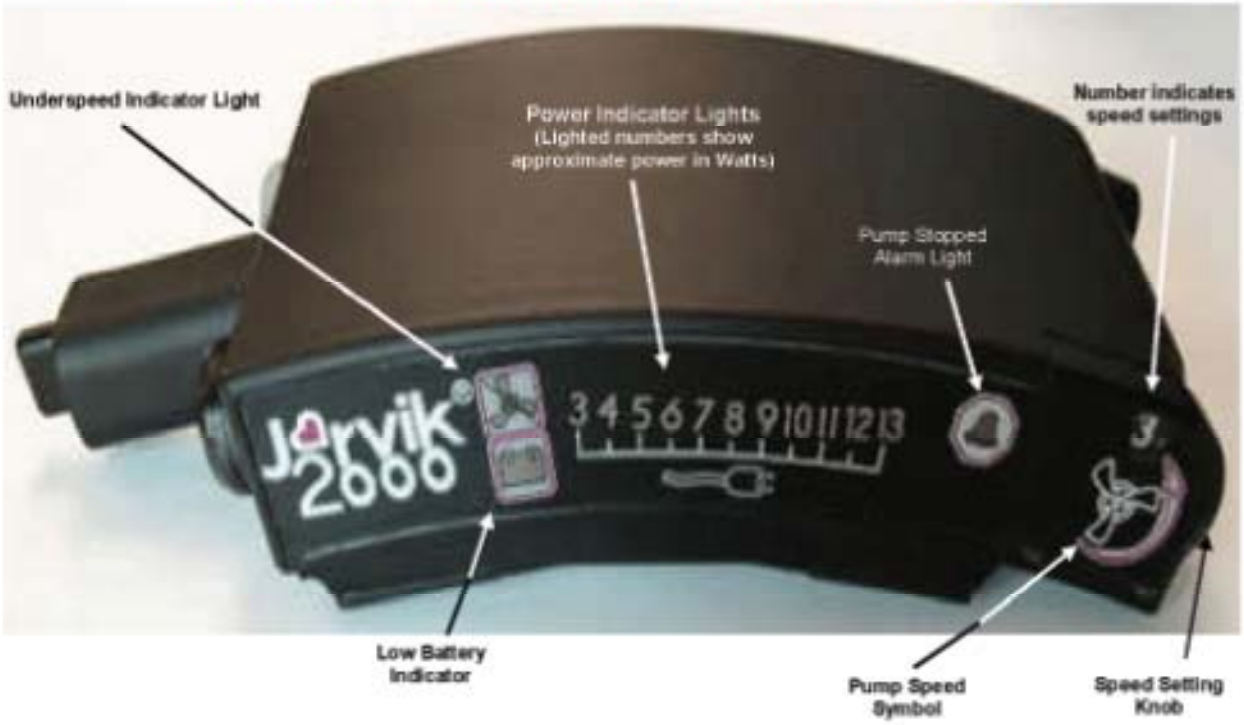
JARVIK 2000 FLOWMAKER (LAVENDER TAG)

Emergency Response Algorithm



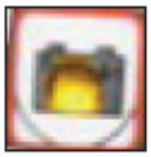
If a patient does present with V-tach / V-fib, they are often conscious, but very weak and upon assessment have the classic low output signs.

Jarvik 2000 FlowMaker Controller Indicators and Troubleshooting



JARVIK 2000 FLOWMAKER (LAVENDER TAG)

If unsure whether pump is working, listen near apex with stethoscope (should hear high-pitched buzz/hum).



A. Low Battery Alarm *(intermittent beep): 5-10 min on Li-Ion; >=15 min on Reserve.*

To change battery, remove blue/gray cap from unused Y-cable port.
Insert end of new battery cable into open port on Y-cable.
Disconnect old battery & put blue cap on open port.

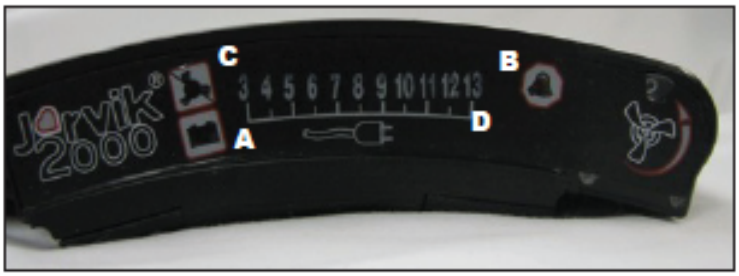
B. Pump Stopped Alarm *(continuous alarm): Pump not connected or running < 5,000 RPM.*

1. Change to a fresh, fully charged battery;
2. If not resolved, check all cables for proper connection & for damage, including the portion of the abdominal cable that connects to the percutaneous lead at the patient's abdomen. If damaged cable, replace with backup (usually attached to patient's spare contoller);
3. If not resolved, change controller & all cables. Spare controller should have back-up Y-cable & abdominal cable attached to it. If not attached & pt symptomatic, do not worry about finding them.
4. Disconnect old abdominal cable (black) from percutaneous lead at patient's abdomen. Set old system, including battery, aside. It will continue to alarm.
5. Connect new battery to Y-cable (gray to gray; or connect battery directly to gray port on spare controller if unable to locate spare Y-cable). New controller will begin to alarm.
6. Connect new controller's abdominal cable to percutaneous lead at abdomen, or connect percutaneous lead directly to black port on controller if unable to find spare abdo cable. New controller should cease alarming and pump power should be > 3W.

7. If controller continues to alarm, check all connections again. If unresolved, attempt to manipulate percutaneous lead & connector (may be lead damage). If still unresolved, transport emergently; contact implanting center to see if IV anticoagulation & inotropes are indicated.

C. Underspeed Alarm *(no audible alarm): pump running below set speed.*

If no other alarms are present, not an emergency. Change to a fully charged Li Ion battery. If unresolved, contact implanting center.



D. High Power Alarm
(13W light will be amber w/audible alarm): Power too high for any speed.Auscultate pump to check for operation.

Change all cables & controller as above. If unresolved, transport emergently. Contact implanting center to see if IV anticoagulation/inotropes are indicated. Most likely cause is pump thrombosis.

HEARTWARE (DARK BLUE TAG)

1. **Can I do external CPR?**

   Chest compressions may pose a risk of dislodgment – use clinical judgment. If chest compressions are administered, confirm function and positioning of the pump.

2. **If not, is there a "hand pump" or external device to use?**

   No.

3. **If the device slows down (low flow state), what alarms will go off?**

   The device runs at a fixed speed. If a low flow state occurs, an alarm will be heard, and the controller display will show a yellow triangle and "Low Flow – Call" message.

4. **How can I speed up the rate of the device?**

   It is not possible to adjust the pump speed in the prehospital setting. Okay to give IV fluids.

5. **Do I need to heparinize the patient if it slows down?**

   Call the accepting VAD facility for guidance.

6. **Can the patient be defibrillated while connected to the device?**

   Yes.

7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**

   No, defibrillate per protocol.

8. **Does the patient have a pulse with this device?**

   The patient may not have a palpable pulse. Depending on the patient's own heart function, you may be able to feel a thready pulse.

9. **What are acceptable vital sign parameters?**

   Goal Mean Arterial Pressure (MAP) is 75 to 90 mmHg. Use a Doppler as the first option to assess blood pressure. If that is not available, use a non-invasive BP (NIBP). If you are using a doppler, place the blood pressure cuff on the patient arm. As you release the pressure in the blood pressure cuff, the first sound you hear with the Doppler is the MAP.

10. **Can this patient be externally paced?**

    Yes

FAQs

- May not be able to obtain cuff pressure (continuous flow pump)
- Pump connected to electric line (driveline) exiting patient's abdominal area and is attached to computer (controller) which runs the pump.
- Pump does not affect EKG
- All ACLS drugs may be given.
- No hand pump is available. This is a rotary (continuous flow) pump with typical speed ranges of 2400 – 3200 RPMs.
- The controller draws power from one battery at a time. A fully charged battery will provide 4-6 hours of power. Both the battery and controller have status lights to indicate the amount of power remaining.
- Transport by ground to implanting facility if possible.
- Be sure to bring **ALL** of the patient's equipment with them.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in AIRTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

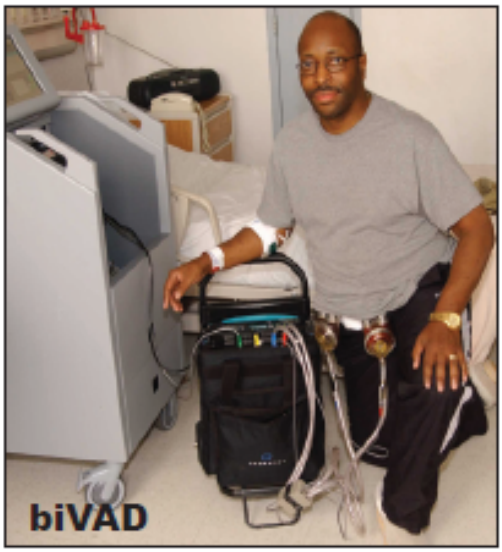
HEARTWARE (DARK BLUE TAG)

HeartWare® Ventricular Assist System Troubleshooting

ALARM TYPE	ALARM DISPLAY (Line 1)	ACTION (Line 2)
High - Critical (FLASHING RED)	VAD STOPPED	CONNECT DRIVELINE
	VAD STOPPED	CHANGE CONTROLLER
	CRITICAL BATTERY 1	REPLACE BATTERY 1
	CRITICAL BATTERY 2	REPLACE BATTERY 2
	CONTROLLER FAILED	CHANGE CONTROLLER
MEDIUM (FLASHING YELLOW)	CONTROLLER FAULT	CALL ACCEPTING VAD HOSPITAL
	CONTROLLER FAULT	CALL: ALARMS OFF
	HIGH WATTS	CALL ACCEPTING VAD HOSPITAL
	ELECTRICAL FAULT	CALL ACCEPTING VAD HOSPITAL
	LOW FLOW	CALL ACCEPTING VAD HOSPITAL
	SUCTION	CALL ACCEPTING VAD HOSPITAL
LOW (SOLID YELLOW)	LOW BATTERY 1	REPLACE BATTERY 1
	LOW BATTERY 2	REPLACE BATTERY 2
	POWER DISCONNECT	RECONNECT POWER 1
	POWER DISCONNECT	RECONNECT POWER 2

THORATEC PVAD (LIGHT BLUE TAG)

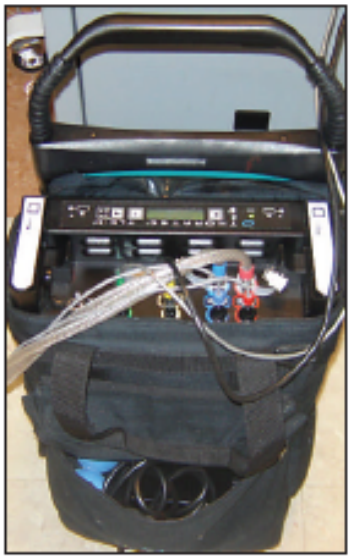
1. **Can I do external CPR?**
   No.
2. **If not, is there a "hand pump" or external device to use?**
   Yes, find the blue or red hand bulbs.
3. **If the device slows down (low flow state), what alarms will go off?**
   Low flow alarms: Loss of fill alarm will occur
4. **How can I speed up the rate of the device?**
   Give volume of IV fluids.
5. **Do I need to heparinize the patient if it slows down?**
   Only if it stops. Patient will be anticoagulated on Coumadin.
   Only heparize if the pump stops.
6. **Can the patient be defibrillated while connected to the device?**
   Yes. Nothing needs to be disconnected. Patient should be placed on battery power BEFORE defibrillation.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   No. If the defibrillation is unsuccessful, disconnect pump and continue to defibrillate.
8. **Does the patient have a pulse with this device?**
   Yes.
9. **What are acceptable vital sign parameters?**
   Normal blood pressure parameters.
10. **Can this patient be externally paced?**
    Usually in BiVAD configuration, if yes the ECG not important to treat. Because both sides of the heart are supported, there is little need to pace regardless of the rhythm seen on ECG.



IVAD is implanted inside the abd cavity and is attached to the same TLC II driver on the outside.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

- These patients have biventricular support through 2 pumps: right and left.
- EKG will NOT correlate with the patient's pulse.
- Patient may be in any arrhythmia, but because they have biventricular support — DO NOT TREAT arrhythmias. Only RVAD or LVAD patients should be treated for arrhythmias.
- Bring all extra batteries & electrical adaptor along during transport. This system is electrically driven.
- The pumps are driven by a compressor called the TLC II driver. The pneumatic hoses and cables plug into the top of the TLC II driver.
- If the Driver loses power, malfunctions, or stops, use the hand pump(s). (hand pump instructions on back of this page)
- Continue hand pumping and then, as soon as possible, replace the TLC II Driver with the backup Driver.



TCL-II Driver

Battery Charger

Batteries loaded into battery slots on TLC-II Driver

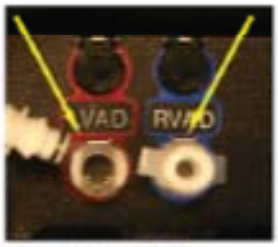
AC Power adapter – plug into yellow port on driver

- Backup Driver accompanies the patient at all times. (Driver replacement instructions on back of this page)
- **WARNING:** If the pump has stopped and blood is stagnant in the device for more than a few minutes (depending on the coagulation status of the patient), there is a risk of stroke or thromboembolism. BEFORE the device is restarted or hand pumping is initiated, contact the implanting center for anticoagulation direction.

JANUARY 2012

THORATEC PVAD (LIGHT BLUE TAG)

Step 1: Obtain hand pump(s) from carrying case. Note: One (1) hand pump is needed for each VAD.



Step 2: Depress metal clip(s) to disconnect the pneumatic lead(s) from the TLC II Driver.

Step 3: Connect the hand pump(s) to the pneumatic lead(s).

Step 4: Squeeze hand pump(s) once per second. Use your foot if necessary.
Note: For 2 VADs (BiVADs), squeeze each hand pump at the same rate. Never hand pump the right VAD (RVAD) faster than the left VAD (LVAD), as this may cause pulmonary edema.

Switching to Backup TLC-II Driver

Step 1: Insert a fully-charged battery (stored in carrying case) into each battery slot of backup TLC-II driver.

Step 2: Turn on key switch

Step 3: Depress metal clip(s) to remove white occluder from pneumatic port(s) :

- LVAD port is RED.
- RVAD port is BLUE.
- Note: for BiVADS, switch LVAD first. Do NOT remove occluder caps from both ports at the same time (or from unused port during single VAD support), or system will depressurize.

Step 4: Disconnect pneumatic lead(s) from primary Driver (or hand pump) and connect to backup Driver.

Step 5: Disconnect electric lead(s) from primary Driver and connect to backup Driver.

Step 6: Place Driver in AUTO mode, if necessary.
Note: Backup Drivers are preprogrammed with a patient's unique settings.

Step 7: Verify full signal(s) is/are ejecting completely.

Step 8: Remove key and place in carrying case pocket.

Step 9: Connect to external power, if available by using the AC power adapter cord.

All modes of emergency transport are acceptable for VAD patients.
Aviation electronics will NOT interfere with VAD operation (and vice versa).

Air Transport Consideration: In rotor wing and fixed wing aircraft flying at heights lower than 10,000 feet-when using the hand pump for external CPR, you must re-purge the bulb every 2000 feet in ascent and 1000 feet in descent. This will assure you have consistent cardiac output.

JANUARY 2012

HEARTMATE XVE (YELLOW TAG)

1. **Can I do external CPR?**
   No.
2. **If not, is there a "hand pump" or external device to use?**
   Yes. Pump at a rate of 60 -90 beats per minute.
3. **If the device slows down (low flow state), what alarms will go off?**
   A red heart alarm light indicator and steady audio alarm will sound if less than 1.5 lpm. Check for hypovolemia or right heart failure and treat if red heart alarm persist after treatment consider performing a controller exchange.
4. **How can I speed up the rate of the device?**
   Give volume of IV fluids.
5. **Do I need to heparinize the patient if it slows down?**
   Please check with the accepting hospital.
6. **Can the patient be defibrillated while connected to the device?**
   No.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   Yes, disconnect from power/batteries first, initiate hand pumping, disconnect controller from driveline, defibrillate the patient, remove hand pump, reattach driveline to controller, and then reattach the power source.
8. **Does the patient have a pulse with this device?**
   Yes, the device produces a Pulsatile flow. Heart rate is independent of pump rate.
9. **What are acceptable vital sign parameters?**
   The BP will vary. 110/80 -140/80. If greater, call the accepting hospital.
10. **Can this patient be externally paced?**
    Yes, keep MA less than 40.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport In ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

Heartmate XVE Controller showing Yellow Wrench & Red Heart Indicator lights

Hand pump & white purge valve

HAND PUMPING PROCEDURE

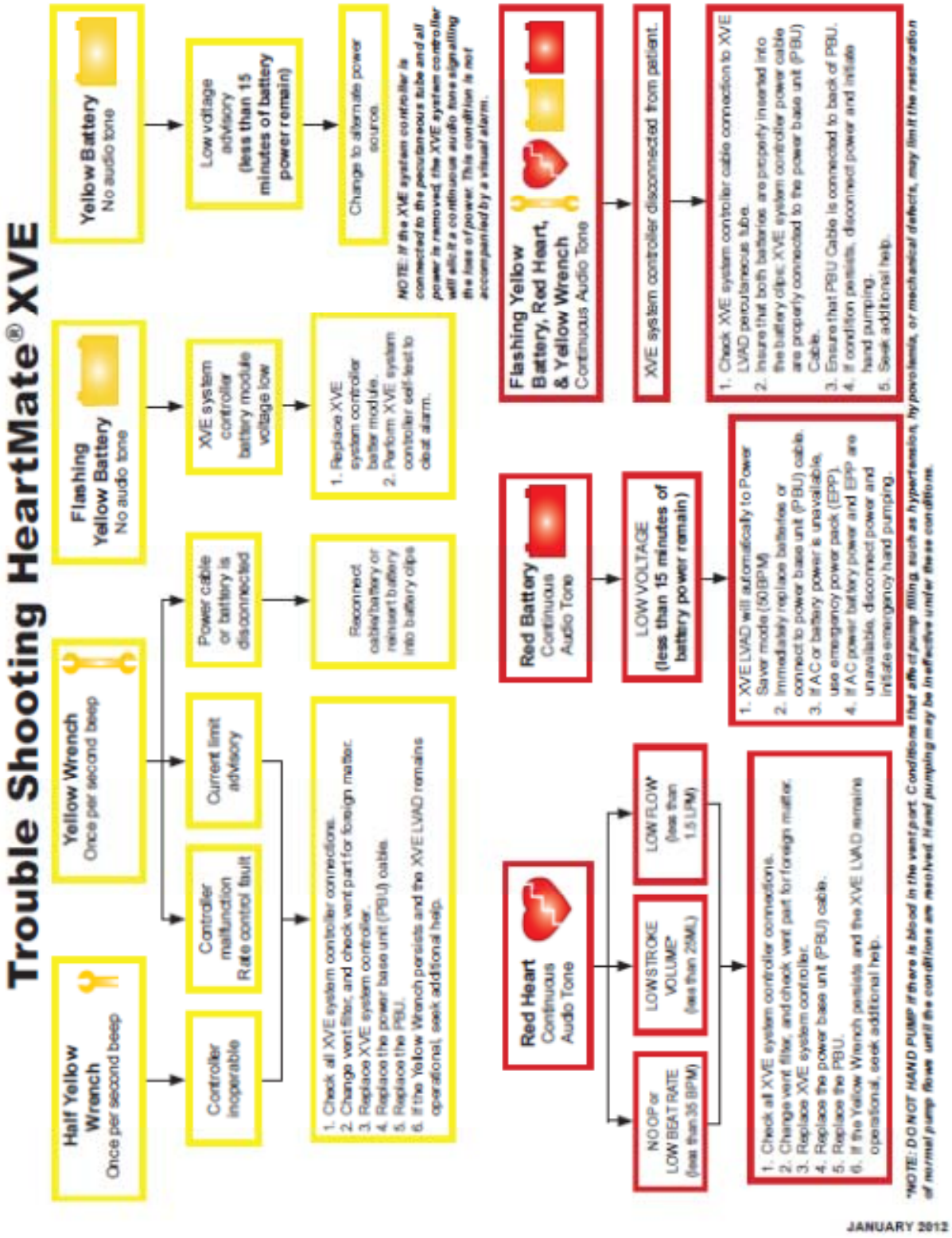
Push in white purge valve

Press the black ball while holding down the white purge valve.

Release purge valve.

Count to 10, push white purge valve & black bulb should re-inflate.

HEARTMATE XVE (YELLOW TAG)



CARDIAC ARREST CHECKLIST AND PIT CREW R – 21 - LUCAS MODIFICATION

REFERENCE V2.0 (12-1-14) Effective 11-1-2012

BLS [No pauses over 10 seconds]

- ☐ Designate and Announce BLS Team Leader (first name included) to all providers on scene upon arrival

Compressions

- ☐ Metronome (Ensure 110 per minute setting)
- ☐ SWITCH every 220 compressions to new compressor, NO EXCEPTIONS
- ☐ Determine who is next for compressions immediately after each switch and move into position

Cycle	1	2	3	★ 4	5	6	7	8	9	10	11	12

Ventilations and Airway Management

- ☐ Non-Hypoxic Arrest | High flow O_2 by NonRebreather Mask/OP for first three (3) cycles of arrest (660 compressions)
- ☐ Hypoxic Arrest | High flow O_2 by BVM/OP for entire code with interposed ventilations at 6/minute (20:1)
- ☐ ★ Switch from CCR to CPR with BVM/OP after 660 compressions and interpose ventilations at 6/minute (20:1)
- ☐ Place $EtCO_2$ immediately upon availability

Defibrillation

- ☐ Attach AED & power on Shock ☐ 1 ☐ 2 ☐ 3 ☐ 4

ALS [Do not interfere with BLS triangle]

- ☐ Designate and Announce Code Commander (first name included) to all providers on scene upon arrival

ECG

- ☐ Verify monitor is in PADDLES mode at all times unless actively pacing
- ☐ Announce ECG interpretation and Protocol for rhythm found on ECG

ETCO2

- ☐ Place $ETCO_2$ filter line to BVM immediately
- ☐ Verify $ETCO_2$ waveform is present and being monitored
- ☐ Print $ETCO_2$ waveform [Upon airway placement | Any patient movement | Termination of care]

Airway

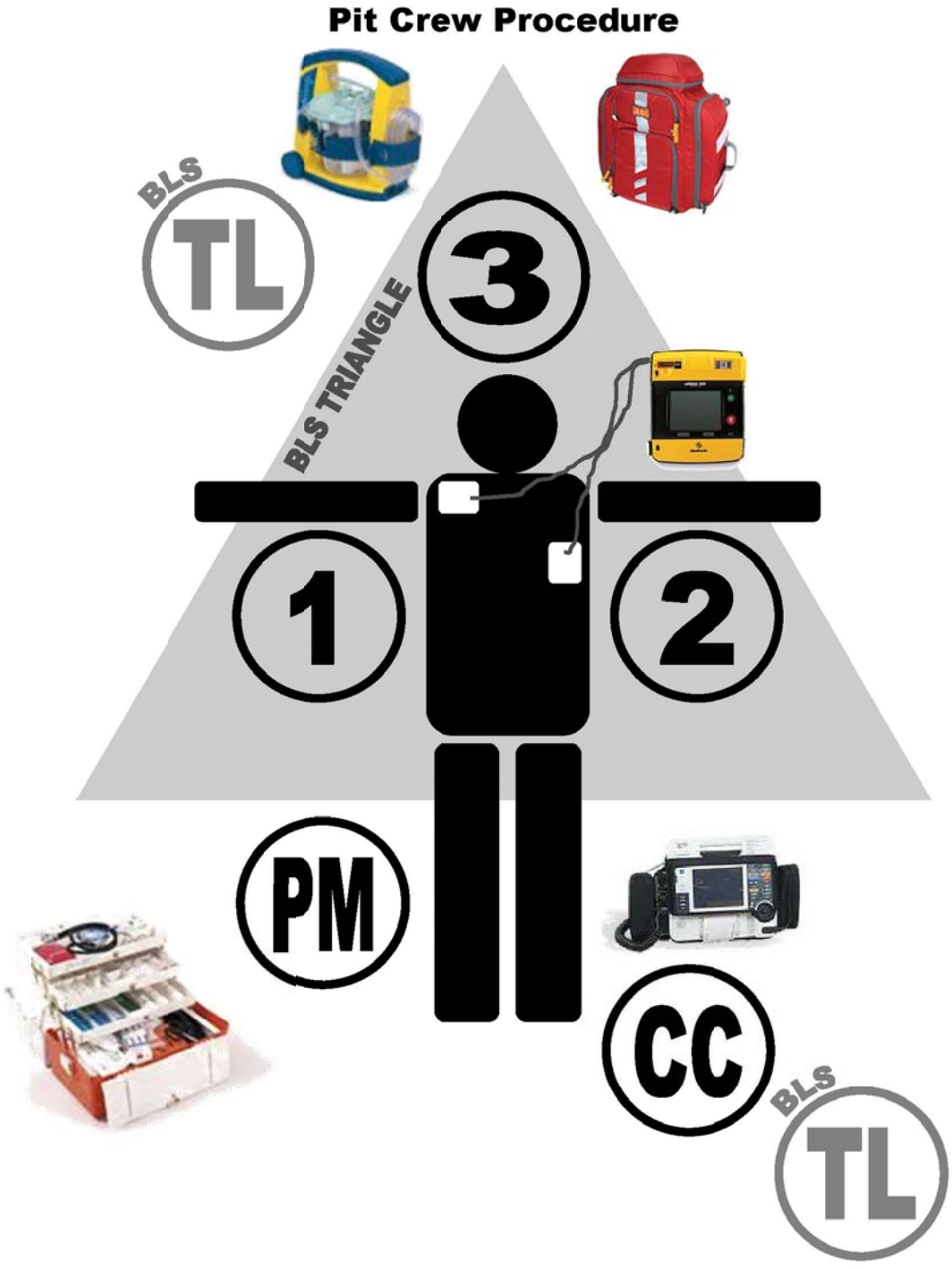
- ☐ After 660 compressions, place advanced airway if needed.
  (Do not stop compressions for airway management).

Address Complications

- ☐ Assess blood glucose
- ☐ Gastric distention has been considered/addressed
- ☐ If unresolved or persistent arrest situation, look for and treat if indicated:
  - ☐ Hypovolemia
  - ☐ Hypo/Hyperkalemia
  - ☐ Hydrogen Ion (Acidosis)
  - ☐ Hypoxia
  - ☐ Tension pneumothorax
  - ☐ Toxins
  - ☐ Thrombosis

ROSC

- ☐ 12 Lead ECG following ROSC
- ☐ Initiate chilled saline bolus if not already started intra-arrest per protocol


Pit Crew Procedure
BLS
TL
3
BLS TRIANGLE
1
2
PM
CC
BLS
TL

CARDIAC ARREST CHECKLIST AND PIT CREW - LUCAS MODIFICATION R – 21

REFERENCE V2.0 (12-1-14) Effective 11-1-2012

Cardiac Arrest Pit Crew Roles and Responsibilities

Position #1

Role	Responsibilities
To facilitate continuous compressions in cardiac arrest and assist with airway/ventilation. Positioned at patient RIGHT Assigned to fire fighter or paramedic on first in unit.	▪ Assess unresponsiveness/pulselessness and initiate compressions ▪ Alternates compressions every 220 compressions with Position #2 ▪ Counts compressions in 20's and calls out 17, 18, 19, 20 each time ▪ Ventilates with BVM in off cycle (20:1) ▪ Assists with airway management as needed

Position #2

Role	Responsibilities
To facilitate continuous compressions in cardiac arrest and assist with airway/ventilation. Positioned at patient LEFT. Assigned to fire fighter or paramedic on first in unit.	▪ Brings and operates AED or LP 12, applies defib pads ▪ Initiates metronome ▪ Applies oxygen via NRM at high flow ▪ Alternates compressions every 220 compressions with Position #1 ▪ Counts compressions in 20's and calls out 17, 18, 19, 20 each time ▪ Ventilates with BVM in off cycle (20:1) ▪ Assists with airway management as needed

Position #3

Role	Responsibilities
To facilitate airway patency and ventilations. Positioned at Patient HEAD. Assigned to fire fighter or paramedic on non-transporting response unit.	▪ Monitors and manages airway for duration of arrest to ensure patency. Maintains invasive airway during patient movement to prevent dislodgement ▪ Reacts to problems ▪ Calls out compressions in increments of 20 (20, 40, 60, 80 . . . 220) ▪ Assembles and applies all airway equipment except ETT ▪ Applies BVM/OP at 660 compression mark with two handed seal on mask ▪ Monitors $EtCO_2$ values and communicates with team ▪ Calls patient movement by team to assure airway maintenance

** Personnel can rotate in and out of Positions 1, 2, and 3 as needed so long as this does NOT interfere with care or interrupt CPR.

Code Team Commander (CC) – Paramedic in control of monitor

Role	Responsibilities
Ownership of all clinical care. Directs all ALS care in coordination with BLS Team Leader oversight of all BLS care. Holds the final responsibility for patient well being. Positioned outside BLS triangle near patient's LEGS Assigned to Paramedic on transport vehicle.	▪ Communicates/coordinates with Team Leader ▪ Makes all patient treatment decisions ▪ Rhythm analysis, interpretation, and application of electrical therapy ▪ Assure accurate on-going documentation of care (written & LP 12) ▪ Determine when patient is moved/transported ▪ Coordinate cease resuscitation issues ▪ Responsible for all clinical communications including medical direction ▪ Responsible for overall conduct of resuscitation ▪ Owns any advanced airway interventions (ETT or Combitube) ▪ Overall documentation of care for entire call

BLS Team Leader (TL)

Role	Responsibilities
Responsible for all BLS efforts in cooperation with Code Team Commander. Monitors clock and communicates times. Owns BLS care. Positioned outside BLS triangle. Assigned to EMT or higher provider.	▪ Works Checklist and calls out times to Code Commander (6, 10, 15, 20 min) ▪ Ensure great BLS, specifically a $\geq$ 90% compression fraction ▪ Tracks compression cycles and ensures switching compressors every 220 ▪ Tracks and calls for ventilations at the 660 compression mark (3rd cycle) ▪ Ensures integrity of BLS triangle ▪ Assists with airway setup if needed ▪ Overall documentation of care for all BLS activities and assists CC with ALS documentation

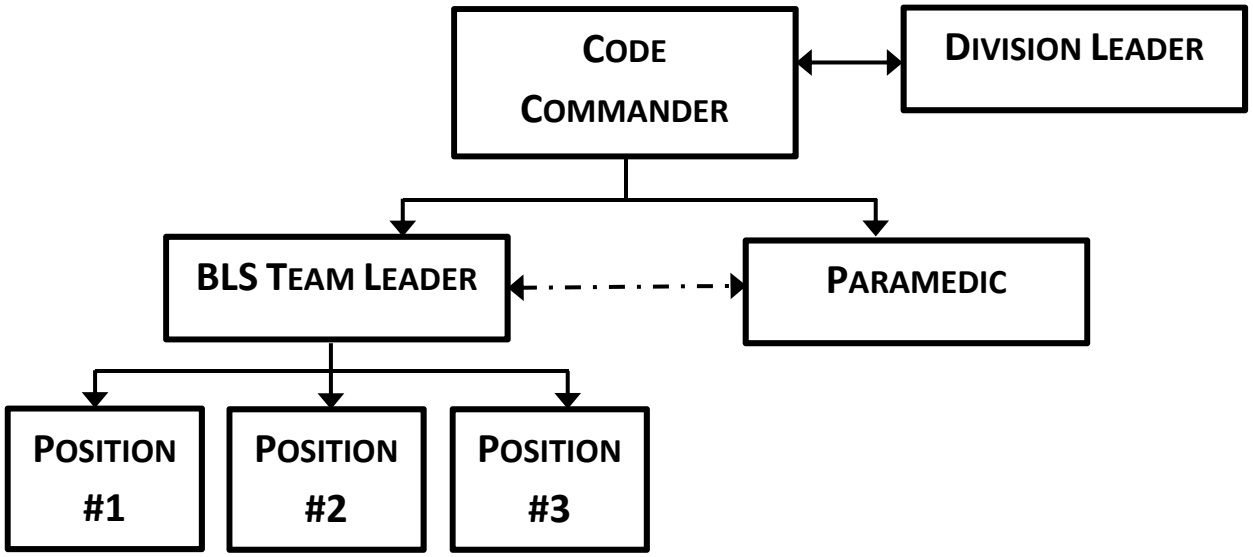
Paramedic (PM)

Role	Responsibilities
Assists and advises Code Commander in the delivery of advanced life support care. Works predominantly outside of the BLS triangle. Assigned paramedic on transport unit or any credentialed paramedic.	▪ Initiates IV/IO access ▪ Applies ALS interventions requested by Code Commander ▪ Communicates with and anticipates needs of Code Commander ▪ Assists with advanced airway as directed by Code Commander ▪ Monitors $EtCO_2$ values and communicates with team ▪ Back stops Code Commander on patient care

Division Leader (DL)

Role	Responsibilities
Supports team as needed When available, applies and operates LUCAS device if patient is transported.	▪ Directs application and operation of LUCAS device per P-37 ▪ Assures ongoing correct placement of LUCAS suction cup ▪ Directs patient movement with LUCAS in place ▪ Back stops Code Commander as needed

Work Flow for Cardiac Arrest



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WESLEY Medical Center

Via Christi HEALTH

November 12, 2013

All hospital and EMS partners in Kansas

Dear Colleagues:

The Kansas Trauma System continues to work in partnership with all who contribute to providing the best care possible to our patients. By continually evaluating best evidence and best practices, we strive to maintain the highest level of patient care. The National Association of EMS Physicians and the American College of Surgeons Committee on Trauma have recently issued a joint position statement entitled "EMS Spinal Precautions and the Use of the Long Backboard." We are moving forward as a state in adopting the recommendations in this joint position statement and would like to share our rationale and vision with you, our partners in patient care. The intent of this letter to is to provide the basis for a unified change in approach to patients with potential spinal injury.

Background: Recommendations for appropriate management of the patient with potential spinal injury has recently shifted considerably from the traditional methods which involved use of long backboards and immobilization for nearly every patient who sustained blunt or penetrating trauma. This has been the default and has historically been considered "standard of care". It was thought to be a precaution that was in the patient's best interest until definitive evaluation could be completed by a physician in a community hospital or even trauma center. It has become increasingly clear that not only is there no benefit to use of long backboards, there is clear evidence of harm, particularly with prolonged use and in specific patient populations.

Definitions:
Spinal motion restriction or **spinal stabilization** is defined as application of a cervical collar and maintenance of the spine in neutral alignment in a patient who meets indications.
Spinal immobilization is defined as application of a cervical collar and long backboard for immobilization of the spine.

We do wish to be clear that "spinal immobilization" using backboards should be conceptually separated from use of "spinal motion restriction / stabilization" in the patient with potential spinal injury. We continue to recommend spinal motion restriction and use of cervical collars in patients meeting specific indications for this intervention consistent with the current literature and with the resources as noted below. Backboards (short or long) should not be considered therapeutic interventions. Rather, their use should be limited to maintaining

neutral spine alignment for extrication purposes in conjunction with use of a cervical collar. Patients should be removed from long or short backboard or KED as soon as possible and maintained in neutral spine alignment to limit morbidity and mortality.

Indications for Spinal Motion Restriction:

- Focal neuro deficit on motor or sensory exam
- High risk patients:
  - Ejection from vehicle
  - Motorcycle crash > 20 mph
  - Auto vs. pedestrian or bike at > 20 mph
  - Axial load to head (i.e. diving)
  - Fall from 3x patient's height
- Low risk patients who:
  - have point tenderness on palpation of spinous processes
  - are not reliable and competent:
    - are not at baseline level of alertness
    - have evidence of clinical intoxication
    - have a distracting injury
    - are unable to communicate adequately

Specific management strategies:

1. Patients who do not meet indications for spinal motion restriction should not receive this intervention at any point during their patient encounter, either in the EMS or hospital environment.
2. Patients who meet indications for spinal motion restriction should have a properly sized cervical collar applied and be maintained in neutral spine alignment until they receive definitive assessment for spinal injury. This may be accomplished in a number of ways. Any method that allows the patient to lay flat and limits unnecessary spinal motion is acceptable. Definitive assessment does not necessarily imply radiologic assessment, and may be as simple as a physician evaluation.
3. Providers should determine and practice methods of patient movement from cot to stretcher and similar typical movements that meet the goal of maintaining neutral spine alignment. Movement aids such as slider boards may be useful in accomplishing this goal, but coordinated patient movement strategies by a team of providers are central to success.
4. Ambulatory patients who meet indications for spinal motion restriction may be managed with a cervical collar and being laid flat until definitive assessment can occur.
5. Patients who meet indications for spinal motion restriction who are transferred to trauma centers for definitive care **SHOULD NOT EVER** be immobilized to a backboard for transfer. They should have their cervical collar left in place and be maintained in neutral spine alignment (which includes reverse Trendelenburg position if needed for patient comfort) for transfer to allow the receiving trauma surgeon to review any radiologic studies of the spine before clearing the patient of need for further spinal motion restriction. This applies even to patients with known spinal fractures.

We appreciate your support as we unify to implement this new "standard of care" in the management of patients with potential spinal injury. We look forward to continued partnership with you as we provide the best care possible to our patients. If we can offer any additional information to facilitate your adoption of these recommendations, please do not hesitate to ask.

Respectfully,

Paul Harrison, MD
Director, Trauma Care
Wesley Medical Center

James Haan, MD
Medical Director, Trauma Services
Via Christi Hospitals

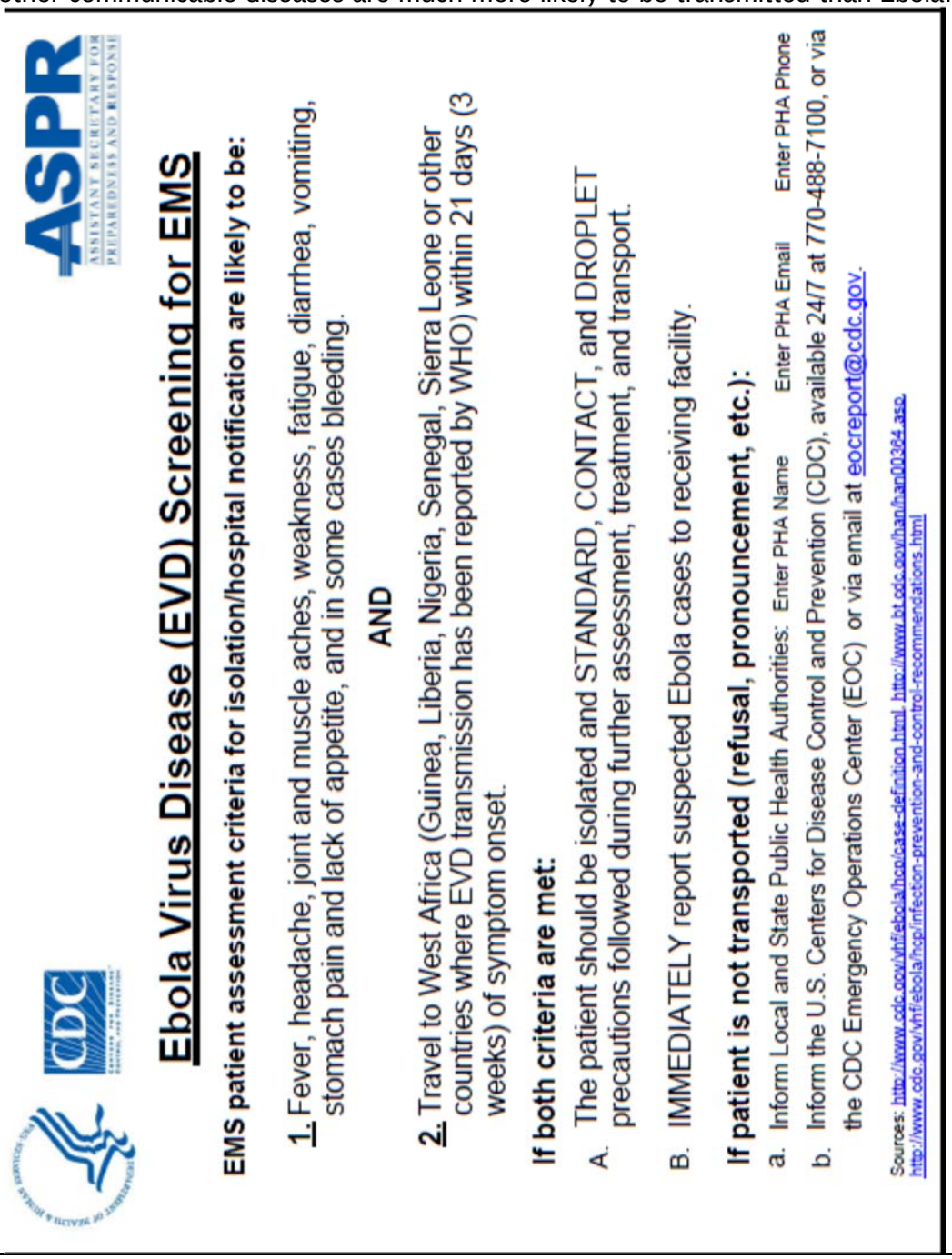
John McMaster, MD
Chair, Medical Society of Sedgwick County
EMS Physician Advisory Committee

Sabina Braithwaite, MD
Sedgwick County
EMS System Medical Director

Resources:

1. Spinal Motion Restriction position statement from the Medical Advisory Board of the Kansas Board of EMS, approved by MAC November 12, 2013, pending KSBEMS approval December 4, 2013.
2. Johnson County Medical Society and Medical Society of Sedgwick County have officially supported the concepts in the Spinal Motion Restriction position statement and have recently approved their own statements / procedures pertaining to this issue.
4. 2011 CDC Field Triage Decision Scheme:
www.cdc.gov/fieldtriage/pdf/decisionscheme_poster_a.pdf
5. EMS Spinal Precautions and the Use of the Long Backboard: National Association of EMS Physicians and American College of Surgeons Committee on Trauma Position Statement. Prehospital Emergency Care 2013; 17:392-393
6. Stuke LE, Pons PT, Guy JS, Chapleau WP, Butler FK, McSwain NE. Prehospital Spine Immobilization for Penetrating Trauma--Review and Recommendations From the Prehospital Trauma Life Support Executive Committee. J Trauma 2011; 71(3):763-770.
7. Theodore N, Hadley MN, Aarabi B, Dhall SS, Gelb DE, Hurlbert RJ, Rozzelle CJ, Ryken TC, Walters BC. Prehospital Cervical Spinal Immobilization After Trauma. Neurosurgery 2013; 72:22-34.

Bottom Line: **WEAR APPROPRIATE PPE around ANY potentially infectious / febrile individual,** other communicable diseases are much more likely to be transmitted than Ebola.



Ebola Virus Disease (EVD) Screening for EMS

EMS patient assessment criteria for isolation/hospital notification are likely to be:

1. Fever, headache, joint and muscle aches, weakness, fatigue, diarrhea, vomiting, stomach pain and lack of appetite, and in some cases bleeding.

AND

2. Travel to West Africa (Guinea, Liberia, Nigeria, Senegal, Sierra Leone or other countries where EVD transmission has been reported by WHO) within 21 days (3 weeks) of symptom onset.

If both criteria are met:

A. The patient should be isolated and STANDARD, CONTACT, and DROPLET precautions followed during further assessment, treatment, and transport.

B. IMMEDIATELY report suspected Ebola cases to receiving facility.

If patient is not transported (refusal, pronouncement, etc.):

a. Inform Local and State Public Health Authorities: Enter PHA Name Enter PHA Email Enter PHA Phone

b. Inform the U.S. Centers for Disease Control and Prevention (CDC), available 24/7 at 770-488-7100, or via the CDC Emergency Operations Center (EOC) or via email at eocreport@cdc.gov.

Sources: http://www.cdc.gov/vhf/ebola/hcp/case-definition.html http://www.bt.cdc.gov/han/han00364.asp http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html

Other Sources – look at weblinks for most current CDC recommendations, they are updated frequently during outbreaks.
http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering-points-management-patients-known-suspected-united-states.html
http://www.cdc.gov/vhf/ebola/hcp/case-definition.html
http://www.bt.cdc.gov/han/han00364.asp
http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html

DEATH NOTIFICATION: GRIEV-ING R – 24

REFERENCE Effective 11-1-2014

Rationale: To provide a standardized method of death notification for EMS providers to support empathic and clear communication with bereaved family members in this difficult situation.

G = Gather	Gather the family, ensure that all members are present. When large numbers of people are present, you may need to ask them to choose closest representatives of the family for the initial notification. Offer to wait if family members will be arriving soon (within reason).
R = Resources	Call for support resources available to assist the family with their grief, i.e., minister, family, friends. Contact Division Leader if it appears that the scene time may need to be extended.
I = Identify	Clearly identify yourself and your role in caring for the patient. Identify the deceased patient by name Determine what the family's understanding of events surrounding the patient's resuscitation and death is
E = Educate	Clearly state the sequence of events leading up to the patient's death, educate them about the current state of their loved one. Use language that is appropriate to the survivors' culture and educational level.
V = Verify	Verify that their family member has died. Be very clear by using the specific **words "dead" or "died**". Do not use unclear words such as "passed away" or "didn't make it". Avoid technical medical terms.
= space	Give the family personal space and time for an emotional moment, allow them time to absorb the information.
I = Inquire	Ask if there are any questions, and answer them all. Immediately but appropriately correct any misconceptions of survivors.
N = Nuts and bolts	Inquire about whether the family wishes to say goodbye / view the body if appropriate. Introduce them to the law enforcement officer (LEO) who responds if possible. Discussions regarding organ donation, funeral services etc can be had by the LEO.
G = Give	Give them a contact, let them know what to expect next (i.e. coroner/ medical examiner role, mortuary, etc). This is likely to be the law enforcement officer that responds to take the report.

Adapted for use in WSC EMSS - taken from Hobgood C, Mathew D, Woodyard D, Shofer F, Brice J. 2013. Death in the field: Teaching paramedics to deliver effective death notifications using the educational intervention "GRIEV-ING". The GRIEV-ING mnemonic is copyright C. Hobgood, MD.