STATE OF OHIO

EMERGENCY MEDICAL, FIRE, AND TRANSPORTATION SERVICES BOARD

REGIONAL PHYSICIANS ADVISORY BOARD

EMERGENCY MEDICAL SERVICES

ADULT GUIDELINES AND PROCEDURES MANUAL

INTRODUCTION

Ohio emergency medical services (EMS) providers strive every day to deliver the highest standard of emergency medical services to the people of Ohio. On behalf of the State Board of Emergency Medical, Fire, and Transportation Services (EMFTS Board), the Regional Physician Advisory Board (RPAB) was charged with drafting proposed guidelines that EMS agencies could use in setting that standard.

The original State of Ohio EMS Guidelines and Procedures Manual was created in 1998 under the esteemed leadership of Dr. Michael Mackan, the chairman of the former RPAB Region VIII, which was comprised of Stark and Summit counties. The EMFTS Board commends Dr. Mackan and his contributing RPAB colleagues for a guideline document that has served Ohio's patients and EMS systems well for many years.

In 2016, the EMFTS Board approved utilization of the National Association of State EMS Officials (NASEMSO) National Model EMS Clinical Guidelines, the first evidence-based, consensus-based, and patient-centric EMS guideline document ever created, as a foundation for all of the State of Ohio EMS guideline documents. This edition of the State of Ohio Adult EMS Guidelines and Procedures Manual incorporates elements of the third edition of the NASEMSO National Model EMS Clinical Guidelines, and it will support the EMFTS Board's goal to adopt evidence-based measures that demonstrate improved patient care and outcomes.

Please note that the proposed guidelines are not mandatory for Ohio EMS agencies. The guidelines and procedures manual is meant to assist in the development of local protocols. It is the Board's hope that individual regions or agencies will review these guidelines with their medical directors and legal counsel when drafting their own individualized protocols. The guidelines will be periodically reviewed by the Regional Physician Advisory Board in order to maintain the most current information available.

Reviewed by: Regional Physician Advisory Board Chairs
Approved by: State Board of Emergency Medical, Fire, and Transportation Services
February 13, 2018
Updated: April 18, 2018; February 13, 2020; December 16, 2020; June 16, 2021, December 15, 2021, April 20, 2023

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REGIONAL PHYSICIAN'S ADVISORY BOARD

EMERGENCY MEDICAL SERVICES BOARD

ADULT GUIDELINES AND PROCEDURES

The initial level of Ohio EMS certification level that applies to a psychomotor skill within a guideline is color coded. The emergency medical technician (EMT) is denoted in green, the advanced emergency medical technician (AEMT) is in blue, and the paramedic is in yellow. Likewise, all algorithms are color coded accordingly to denote procedures that may be performed for the associated level of Ohio EMS certification. For procedures that are color coded in red, medical direction should be contacted to obtain permission and guidance.

Higher levels of EMS certification will perform lower level evaluations and procedures when interpreting the guidelines and algorithms.

KEY TO GUIDELINES

Emergency Medical Technician: EMT

Advanced Emergency Medical Technician: AEMT

Paramedic: PARAMEDIC

KEY TO ALGORITHMS

EMERGENCY MEDICAL TECHNICIAN (EMT)

ADVANCED EMERGENCY MEDICAL TECHNICIAN (AEMT)

PARAMEDIC

ON-LINE MEDICAL DIRECTION

GENERAL CONSIDERATIONS

A. It is important to remember that abdominal pain can be caused by a large number of different disease processes. The organ systems that may be involved in abdominal pain include esophagus, stomach, intestinal tract, liver, pancreas, spleen, kidneys, male and female genital organs, bladder, as well as referred pain from the chest that can involve the heart, lungs or pleura. Abdominal pain may also be caused by muscular and skeletal problems. This guideline addresses abdominal pain that is not due to or related to trauma or to second or third trimester pregnancy.

B. There are a limited number of problems that present with abdominal pain that are life-threatening or may become life-threatening.
   1. Myocardial Infarction
   2. Perforated stomach, gallbladder, or bowel
   3. Gastrointestinal bleeding with pain - usually due to an ulcer
   4. Hemorrhagic pancreatitis
   5. Appendicitis
   6. Diabetic ketoacidosis
   7. Ruptured esophagus (this usually presents with chest pain)
   8. Dissecting or ruptured abdominal aortic aneurysm
   9. Certain toxic mushrooms ingestion and other toxic ingestion
   10. Ectopic pregnancy
   11. Acute cholecystitis
   12. Pyelonephritis
   13. Ischemic or necrotic bowel

C. Abdominal pain emergencies are likely to lead to death due to blood or fluid loss with resultant shock. There may also be severe electrolyte abnormalities that can cause arrhythmias. Abdominal pain in patients who are elderly, immunocompromised, and those with bleeding disorders or are taking anticoagulant medications (blood thinners) may be a warning sign for severe illness.

NOTE: Myocardial infarction may present as abdominal pain especially in the diabetic or elderly patients.

EMT

A. Secure airway
   1. Administer oxygen as needed to treat shock and/or respiratory distress
   2. Apply pulse oximeter and treat per pulse oximeter procedure, if available.

B. Obtain vital signs, including temperature if feasible, and assess neurologic status

C. Evaluate patient's general appearance, relevant history of condition and determine:

Onset of the event	**S**igns and symptoms
Provocation or palliation	**A**llergies
Quality of the pain	**M**edications
Region and radiation	**P**ast Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Severity	
Time	**L**ast oral intake
	Events leading to present illness

D. Assess additional associated signs and symptoms:
   1. Nausea / vomiting blood or coffee grounds
   2. Constipation / diarrhea - black, tarry or bloody bowel movements
   3. Problems with urination
   4. Menstrual abnormality
   5. Fever
   6. Tenderness, rigidity, and presence or absence of bowel sounds.
   7. Cardiac associated symptoms: Dyspnea, diaphoresis, shortness of breath (SOB)
   8. Rebound tenderness

9. Guarding
10. Abdominal distension
11. Abdominal tympany to percussion
12. Tenderness focal to a specific abdominal quadrant
13. Presence of a “pulsatile” abdominal mass
14. Absence of or significant inequality of the femoral or distal arterial pulses in the lower extremities
15. Hyperthermia or hypothermia
16. Rectal or vaginal bleeding, hematemesis (vomiting blood)
17. Jaundice

E. Obtain a blood glucose if hyperglycemia is suspected

F. Transport in position of comfort, preferable supine with knees flexed, unless there is respiratory distress. If transport time is not significantly prolonged, consider specialty destination centers for conditions such as suspected abdominal aortic aneurysm or aortic dissection.

G. Give nothing by mouth

H. Reassess the patient’s vital signs and response to therapeutic interventions throughout transport

AEMT

A. Start an IV as deemed necessary to provide fluid resuscitation and/or analgesia. If the patient is hypotensive or if there is concern or evidence of blood or fluid loss, administer IV fluids at a rate to maintain perfusion/

B. Evaluate the patient’s pain and administer analgesia per the pain management guideline.

C. Administer antiemetics for nausea or vomiting as deemed necessary.

D. Apply a cardiac monitor during transport if appropriate.

PARAMEDIC

A. Start an IV as deemed necessary to provide fluid resuscitation and/or analgesia. If the patient is hypotensive or if there is concern or evidence of blood or fluid loss, administer IV fluids at a rate to maintain perfusion/

B. Evaluate the patient’s pain and administer analgesia per the pain management guideline.

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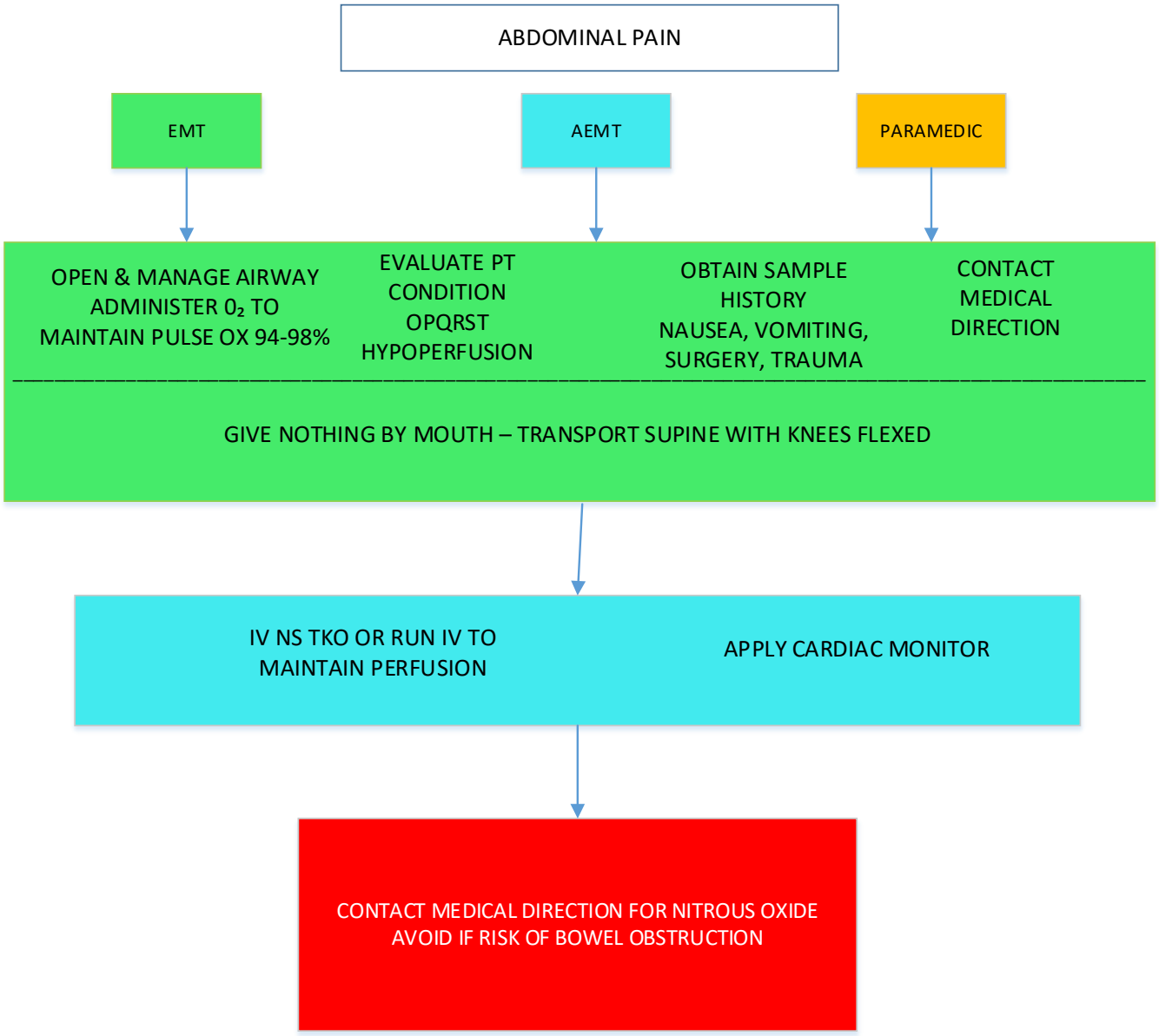
D. Apply a cardiac monitor during transport if appropriate.


ABDOMINAL PAIN
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER 0_2 TO
MAINTAIN PULSE OX 94-98%
EVALUATE PT
CONDITION
OPQRST
HYPOPERFUSION
OBTAIN SAMPLE
HISTORY
NAUSEA, VOMITING,
SURGERY, TRAUMA
CONTACT
MEDICAL
DIRECTION
GIVE NOTHING BY MOUTH – TRANSPORT SUPINE WITH KNEES FLEXED
IV NS TKO OR RUN IV TO
MAINTAIN PERFUSION
APPLY CARDIAC MONITOR
CONTACT MEDICAL DIRECTION FOR NITROUS OXIDE
AVOID IF RISK OF BOWEL OBSTRUCTION

EMT

A. Secure airway, and consider cervical spine injury
   1. Administer 100% oxygen by NRB mask
   2. Apply pulse oximeter and/or capnography device and use measurements to guide treatment
   3. Be prepared to hyperventilate and/or assist ventilations with an oral or nasal airway and bag valve mask (BVM) or positive pressure ventilation (PPV)
   4. If available, apply a CO-oximeter to assess for carbon monoxide poisoning

B. Evaluate patient's general appearance, relevant history of condition and determine:

Onset of the event
Provocation or palliation
Quality of the pain
Region and radiation
Severity
Time

Signs and symptoms
Allergies
Medications
Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Last oral intake
Events leading to present illness

The mnemonic AEIOU TIPS is one tool that is commonly used to determine the cause of a patient's altered mental status.

A - Alcohol
E - Epilepsy
I - Insulin
O – Overdose
U – Underdose/Uremia

T - Trauma
I - Infection
P - Psychiatric
S- Stroke/Shock

For trauma patients, particularly those with a suspected brain injury, assess the patient using the Glasgow Coma Scale (GCS). Patients with GCSs of 8 or less have poor prognosis and need advanced life support (ALS) as soon as possible.

In possible stroke patients who are alert, assessment of language, motor responses and sensation must be completed to establish baselines for future changes.

Pulseless patients or those with a weak or slow pulse following a known or suspected opioid overdose should be managed as cardiac arrest patients. Standard resuscitative measures should be initiated immediately and should take priority over naloxone administration or waiting for a response from previously administered naloxone.

C. Obtain a blood glucose measurement if the equipment is available. Consider administration of glucose with intact gag reflex.

D. If an opioid overdose is suspected, administer naloxone (Narcan®) 2 mg intranasally (IN) or 0.4 mg via auto-injector (EVZIO®). Contact medical direction if the patient's mental status does not improve or if the patient's mental status deteriorates following transient improvement.

E. Transport immediately unless an ALS unit is enroute and has an ETA of less than 5 minutes to the scene.

AEMT

A. Assist EMS professionals, obtain patient condition and circumstance

B. If the patient does not have a secure, protected airway, intubate per Intubation Procedure

C. Apply monitor and check rhythm

D. Start heplock/saline lock or IV normal saline TKO while enroute to hospital

E. Consider determination of blood sugar level, if available.
   1. Blood sugar less than 60 mg/dl, administer D50 50 ml IV push immediately or glucagon 1 mg IM (alternate treatment of D10 100 ml IV). Repeat dose if blood sugar remains < 60 mg/dl.
   2. If blood sugar greater than 400 mg/dl and signs of hypoperfusion are present, administer IV fluid bolus of at least 250 ml of saline. The bolus may be repeated if no response in 10 minutes.
   3. If unable to check blood sugar and level of consciousness (LOC) is decreased, administer dextrose 25 gm IV push or glucagon 1 mg IM.

F. If respirations are impaired, or there is a high index of suspicion of narcotic overdose and patient does not respond to dextrose or fluid bolus, administer naloxone (Narcan®) 2 mg by IV push, nebulizer, IO, IM, IN, or SQ or administer naloxone 0.4 mg via auto-injector (EVZIO®). If the patient has been intubated, administration of naloxone 2 mg via the endotracheal route is an option. If the patient improves somewhat with naloxone but is not fully awake, repeat dose

CONSIDER PHYSICAL AND/OR CHEMICAL PATIENT MANAGEMENT
BEFORE ADMINISTRATION OF NALOXONE
SEE MANAGENT OF AGITATED/VIOLENT PATIENTS AND BEHAVIORAL EMERGENCIES GUIDELINE

H. Re-evaluate patient condition, contact medical direction, and transport to hospital
Check blood sugar or draw blood chemistry tube.

F. If blood sugar greater than 400 mg/dl and signs of hypoperfusion are present, administer IV fluid bolus of at least 250 ml of saline. The bolus may be repeated if no response in 10 minutes.

DO NOT DELAY TRANSPORT

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. If patient does not have a secure, protected airway, intubate per Intubation Procedure

C. Apply monitor and check rhythm

D. Start heplock/saline lock or IV normal saline TKO.

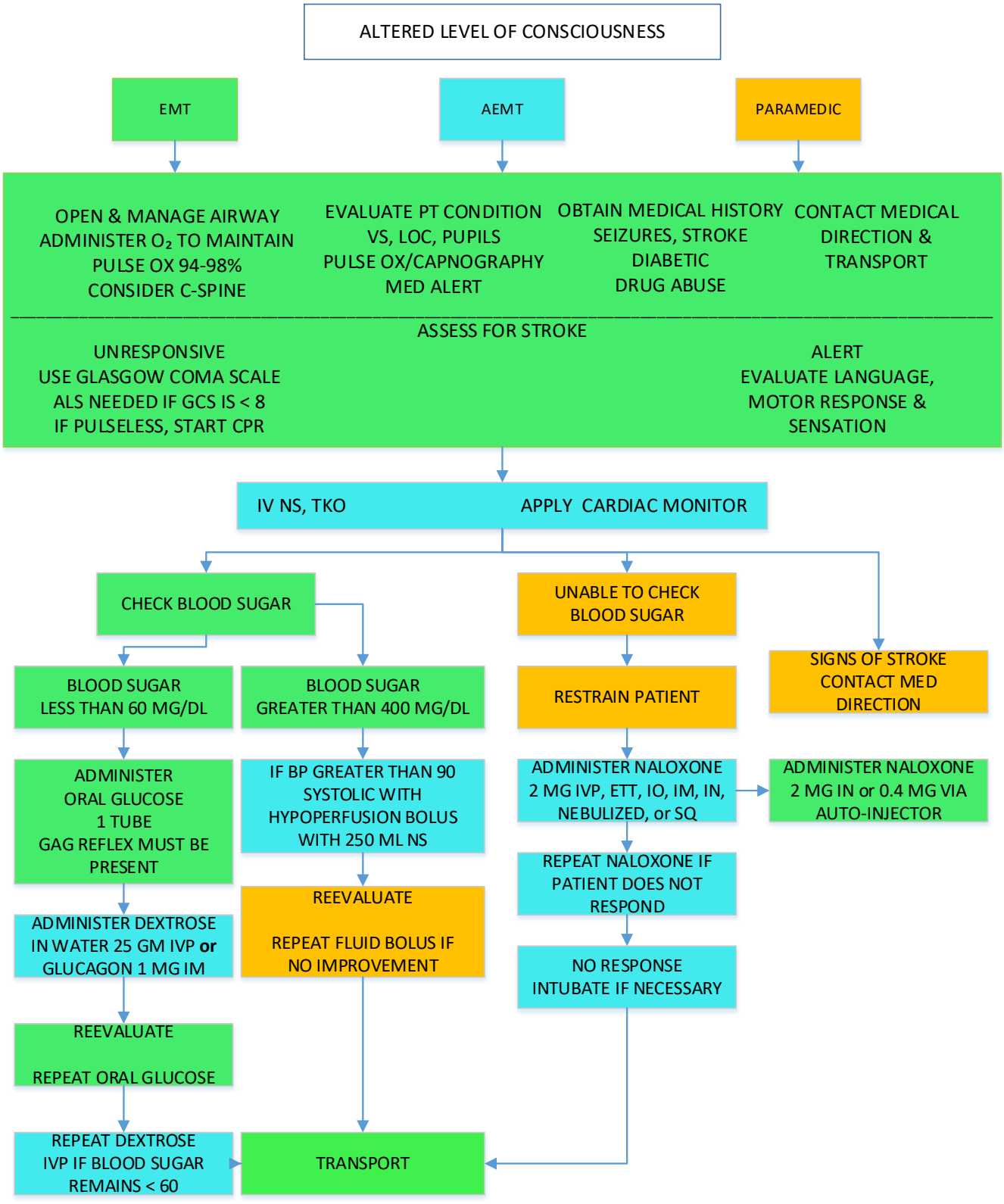
E. If signs of stroke, contact medical direction.

F. Consider determination of blood sugar level, if available.
   1. Blood sugar less than 60 mg/dl, administer D50 50 ml IV push immediately or glucagon 1 mg IM (alternate treatment of D10 100 ml IV for adult). Repeat dose if blood sugar remains < 60 mg/dl.
   2. If blood sugar greater than 400 mg/dl and signs of hypoperfusion are present, administer IV fluid bolus of at least 250 ml of saline. The bolus may be repeated if no response in 10 minutes.
   3. If unable to check blood sugar and LOC is decreased administer dextrose 25 gm IV push or glucagon 1 mg IM.

G. If respirations are impaired or there is a high index of suspicion of narcotic overdose and patient does not respond to dextrose or fluid bolus, administer naloxone (Narcan®) 2 mg by IV push, nebulizer, IO, IM, IN, or SQ or administer naloxone 0.4 mg via auto-injector (EVZIO®). If the patient has been intubated, administration of naloxone 2 mg via the endotracheal route is an option. If patient improves somewhat with naloxone but is not fully awake, repeat dose.

CONSIDER PHYSICAL AND/OR CHEMICAL PATIENT MANAGEMENT
BEFORE ADMINISTRATION OF NALOXONE
SEE MANAGENT OF AGITATED/VIOLENT PATIENTS AND BEHAVIORAL EMERGENCIES GUIDELINE

H. Re-evaluate patient condition, contact medical direction, and transport to hospital


ALTERED LEVEL OF CONSCIOUSNESS
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O_2 TO MAINTAIN
PULSE OX 94-98%
CONSIDER C-SPINE
EVALUATE PT CONDITION
VS, LOC, PUPILS
PULSE OX/CAPNOGRAPHY
MED ALERT
OBTAIN MEDICAL HISTORY
SEIZURES, STROKE
DIABETIC
DRUG ABUSE
CONTACT MEDICAL
DIRECTION &
TRANSPORT
ASSESS FOR STROKE
UNRESPONSIVE
USE GLASGOW COMA SCALE
ALS NEEDED IF GCS IS < 8
IF PULSELESS, START CPR
ALERT
EVALUATE LANGUAGE,
MOTOR RESPONSE &
SENSATION
IV NS, TKO
APPLY CARDIAC MONITOR
CHECK BLOOD SUGAR
UNABLE TO CHECK
BLOOD SUGAR
SIGNS OF STROKE
CONTACT MED
DIRECTION
BLOOD SUGAR
LESS THAN 60 MG/DL
BLOOD SUGAR
GREATER THAN 400 MG/DL
RESTRAIN PATIENT
ADMINISTER
ORAL GLUCOSE
1 TUBE
GAG REFLEX MUST BE
PRESENT
IF BP GREATER THAN 90
SYSTOLIC WITH
HYPOPERFUSION BOLUS
WITH 250 ML NS
ADMINISTER NALOXONE
2 MG IVP, ETT, IO, IM, IN,
NEBULIZED, or SQ
ADMINISTER NALOXONE
2 MG IN or 0.4 MG VIA
AUTO-INJECTOR
ADMINISTER DEXTROSE
IN WATER 25 GM IVP or
GLUCAGON 1 MG IM
REEVALUATE
REPEAT FLUID BOLUS IF
NO IMPROVEMENT
REPEAT NALOXONE IF
PATIENT DOES NOT
RESPOND
REEVALUATE
REPEAT ORAL GLUCOSE
NO RESPONSE
INTUBATE IF NECESSARY
REPEAT DEXTROSE
IVP IF BLOOD SUGAR
REMAINS < 60
TRANSPORT

GENERAL CONSIDERATIONS

A. In the treatment of cardiac arrhythmias, the current American Heart Association guidelines were referenced for guideline development

B. Always provide oxygen support, make the patient comfortable, and provide reassurance

C. Transport is essential when Advanced Cardiac Life Support is not available within 10 minutes of receipt of the call

EMT / AEMT

A. Open and manage the airway and provide 100% oxygen by non-rebreather (NRB) mask. Apply pulse oximeter titrating the oxygen flow to achieve an oxygen saturation of 94-98%

B. Make patient comfortable, provide reassurance, and check a blood glucose

C. Evaluate patient's general appearance, relevant history of condition and determine:

Onset of the event
Provocation or palliation
Quality of the pain
Region and radiation
Severity
Time

Signs and symptoms
Allergies
Medications
Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Last oral intake
Events leading to present illness

D. If patient is experiencing an unusual and/or irregular heart rate or pulse, if available, application of the cardiac monitor may be applied by the AEMT with assistance from the EMT if necessary. The AEMT may obtain a monitor strip for evaluation by the physician at the emergency department. This should only be done during transport, and the EMS professional must advise the patient the monitor strip is being obtained solely for the physician and the EMS professional cannot provide the patient with an interpretation of the strip.

E. Establish communications with medical direction and advise them of patient condition. Transport immediately unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. Apply cardiac monitor and determine arrhythmia

C. Start IV/IO normal saline (NS)

D. Treat arrhythmia as follows:

1. Bradycardia

   If heart rate is < 60 beats per minute, assess patient's perfusion. Signs or symptoms of poor perfusion include:

   - Hypotension
   - Acutely altered mental status
   - Signs of shock
   - Ischemic chest discomfort
   - Acute heart failure
   - If patient is taking calcium channel blockers or is a possible beta blocker overdose, consider calling medical direction for appropriate antidote.

   a. Good perfusion
      i. Transport
      ii. If second degree heart block type II or third-degree heart block, prepare patient for external pacing by applying external pacer pads. If the patient develops signs of poor perfusion, initiate external pacing.

   b. Poor perfusion:
      i. Consider sedation Valium®/Versed® 3-5 mg IV
      ii. External pacemaker set at 80 beats per minute and start at 20 milliamps. Increase by 20 milliamperes every ten seconds until mechanical capture is obtained;

      NOTE: Atropine may be administered while preparing for pacing

      iii. Atropine 0.5 mg IVP, subsequent doses 0.5 mg every 3-5 minutes up to 3 mg (0.04 mg/kg), or until heart rate is 60 and an adequate systolic blood pressure (SBP) is obtained (SBP greater than 90 with adequate level of consciousness).
      iv. If perfusion is poor after maximum dose of atropine, these three therapeutic interventions can be initiated to achieve the goal of a systolic BP of 90, a mean arterial pressure of 65, or improvement in the patient's level of consciousness.
         - Epinephrine 0.2-2 mcg/kg/minute IV
         - Epinephrine 10-20 mcg IV push doses every 2 minutes
         - Norepinephrine 0.02-0.04 mcg/kg/minute IV

2. Narrow complex tachycardias:

   If heart rate is < 150 beats per minute, assess patient's perfusion. Signs/symptoms of poor perfusion include:

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

   a. Good Perfusion
      i. Vagal maneuver or carotid massage
      ii. Adenosine (Adenocard®) 6 mg rapid IV push followed immediately by a 20 ml bolus of saline
      iii. If no response in 1-2 minutes, adenosine 12 mg rapid IV push followed immediately by a 20 ml bolus of saline.

iv. If the patient does not respond to adenosine, consider contacting medical direction for orders for additional medications.
v. If patient remains stable, observe and transport.

NOTE: If at any time the patient becomes unstable with poor perfusion, go directly to synchronous cardioversion.

b. Poor perfusion:

NOTE: Based on assessment findings, the Paramedic may choose to administer adenosine before attempting synchronized cardioversion if the ventricular complexes are regular and narrow. If the patient is unstable with poor perfusion, the Paramedic may omit adenosine administration and proceed directly to synchronized cardioversion immediately.

i. Adenosine 6 mg rapid IV push followed immediately by a 20 ml NS bolus IV.
ii. If no response in 1-2 minutes, adenosine 12 mg rapid IV push followed immediately by a 20 ml NS bolus IV.
iii. Consider sedation Valium®/Versed® 5mg IV
iv. Initial synchronized cardioversion:
(a) 50-100 J (monophasic or biphasic) for narrow regular complexes or at the energy recommended by the manufacturer
(b) 200 J monophasic or 120-200 J biphasic for narrow irregular complexes or at the energy recommended by the manufacturer

3. Wide complex tachycardias (with a pulse):

Assess patient's perfusion. Signs or symptoms of poor perfusion include

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

Antiarrhythmics that are indicated for a wide complex tachycardia are amiodarone, procainamide, lidocaine, or adenosine. The choice of the antiarrhythmic to be administered should be predetermined by the medical director for your organization. Please follow these guidelines for the administration.

- Amiodarone 150 mg IVP over 2- 3 minutes
  - If the patient's condition is unchanged ten minutes after the first dose, a second dose of amiodarone and a maintenance infusion of 1 mg/minute may be administered by medical direction order.
- Procainamide IV infusion of 20-50 mg/minute
  - Maximum dose is 17 mg/kg
  - Discontinue infusion if the arrhythmia becomes suppressed, hypotension or signs and symptoms of CHF develop, development of a prolonged QRS complex greater than 50%, or the maximum dose of 17 mg/kg has been administered.
  - Consider contacting medical direction for orders to begin a maintenance IV infusion of procainamide at 1-4 mg/minute.
- Lidocaine 1-1.5 mg/kg IVP
  - May repeat the dose every 5 minutes to a maximum dose of 3 mg/kg IVP
- Adenosine 6 mg rapid IVP followed by a 10 ml fluid bolus
  - If monomorphic tachycardia continues, give adenosine 12 mg rapid IVP

NOTE: If at any time the patient becomes unstable and/or has poor perfusion, go directly to synchronous cardioversion.

NOTE: Do not administer more than one antiarrhythmic simultaneously to a patient. The choice of the antiarrhythmic to be administered should be predetermined by the medical director for your organization.

i. Consider sedation Valium®/Versed® 5mg IV

iii. Initial synchronized cardioversion:
(a) 100 J (monophasic or biphasic) for wide regular complexes or at the energy recommended by the manufacturer

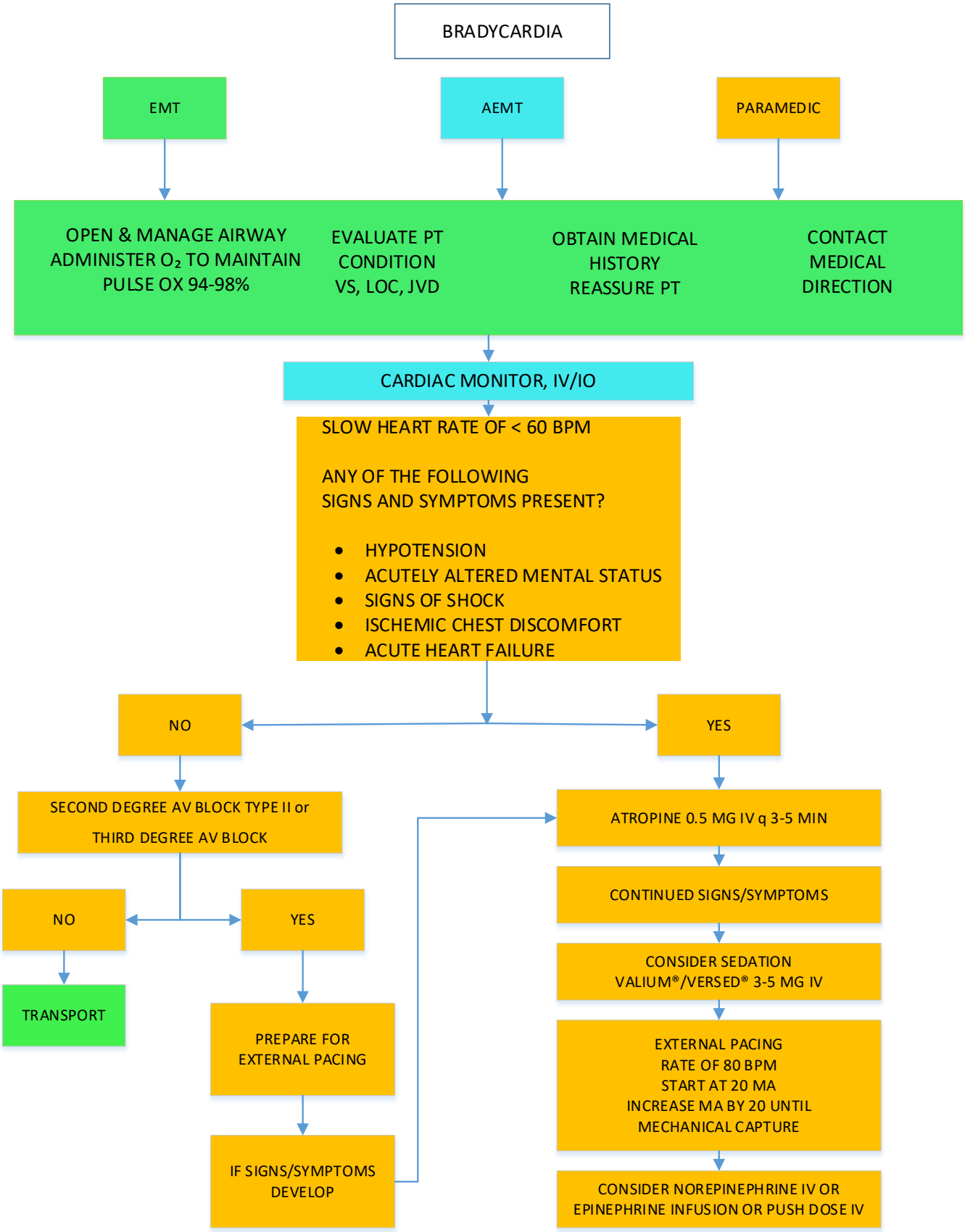
Wide irregular complexes are typically not associated with a stable patient with normal perfusion. Contact medical direction for advice on these rare cases.

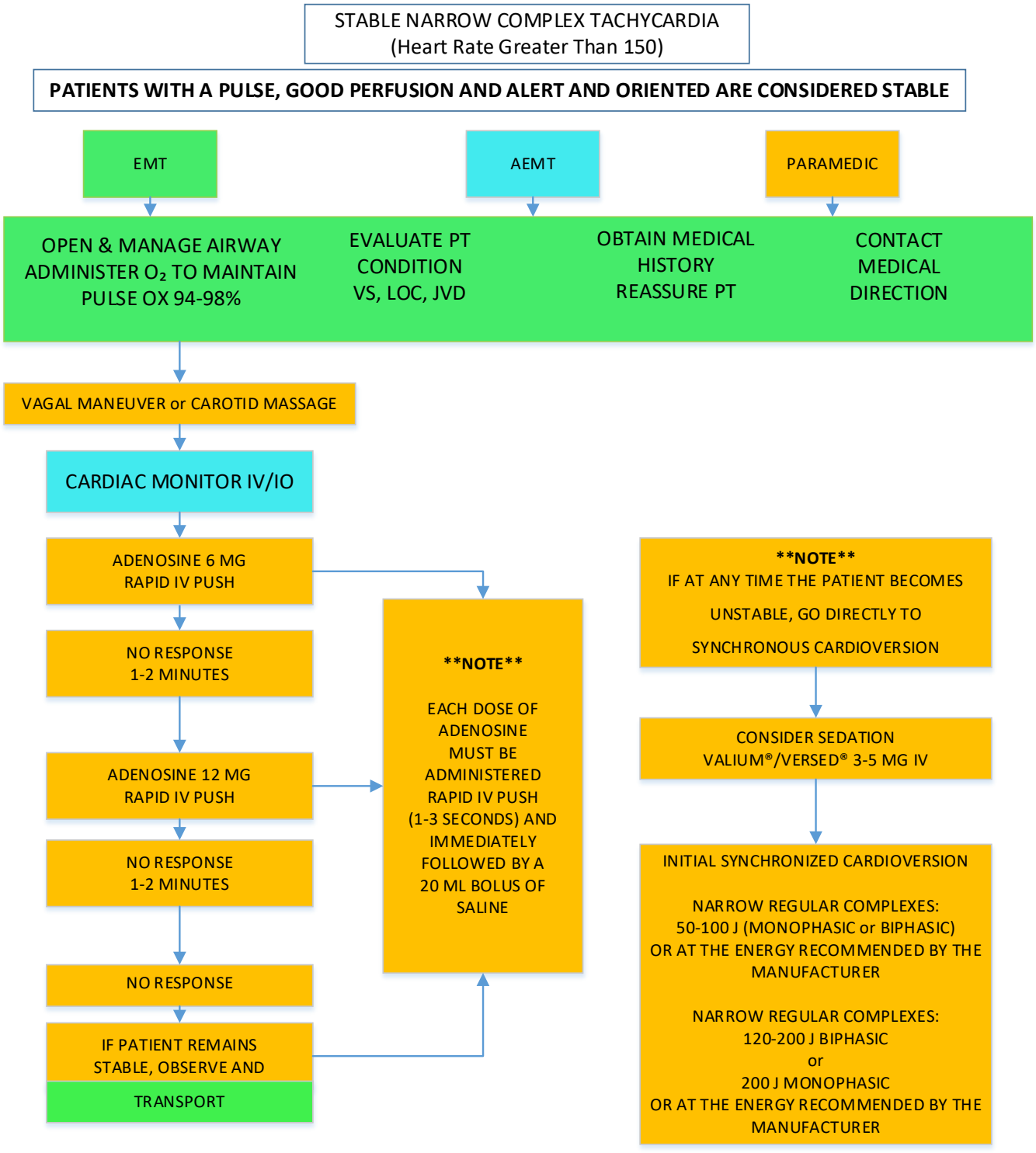
a. Poor perfusion (with a pulse):
   i. Prepare for immediate synchronized cardioversion
   ii. Consider sedation Valium®/Versed® 5mg IV
   iii. Synchronous cardioversion:
      (a) 100 J (monophasic or biphasic) for wide regular complexes or at the energy recommended by the manufacturer
      (b) Defibrillation with high-energy (unsynchronized) shocks for wide irregular complexes
   iv. Administer an antiarrhythmic. Antiarrhythmics that are indicated for a wide complex tachycardia are amiodarone or procainamide. The choice of the antiarrhythmic to be administered should be predetermined by the medical director for your organization. Please follow these guidelines for the administration.
      - Amiodarone 150mg IVP over 2- 3 minutes
        - If the patient's condition is unchanged ten minutes after the first dose, a second dose of amiodarone and a maintenance infusion of 1 mg/minute may be administered by medical direction order.
      - Procainamide IV infusion of 20-50 mg/minute
        - Maximum dose is 17 mg/kg
        - Discontinue infusion if the arrhythmia becomes suppressed, hypotension or signs and symptoms of CHF develop, development of a prolonged QRS complex greater than 50%, or the maximum dose of 17 mg/kg has been administered.
        - Consider contacting medical direction for orders to begin a maintenance IV infusion of procainamide at 1-4 mg/minute

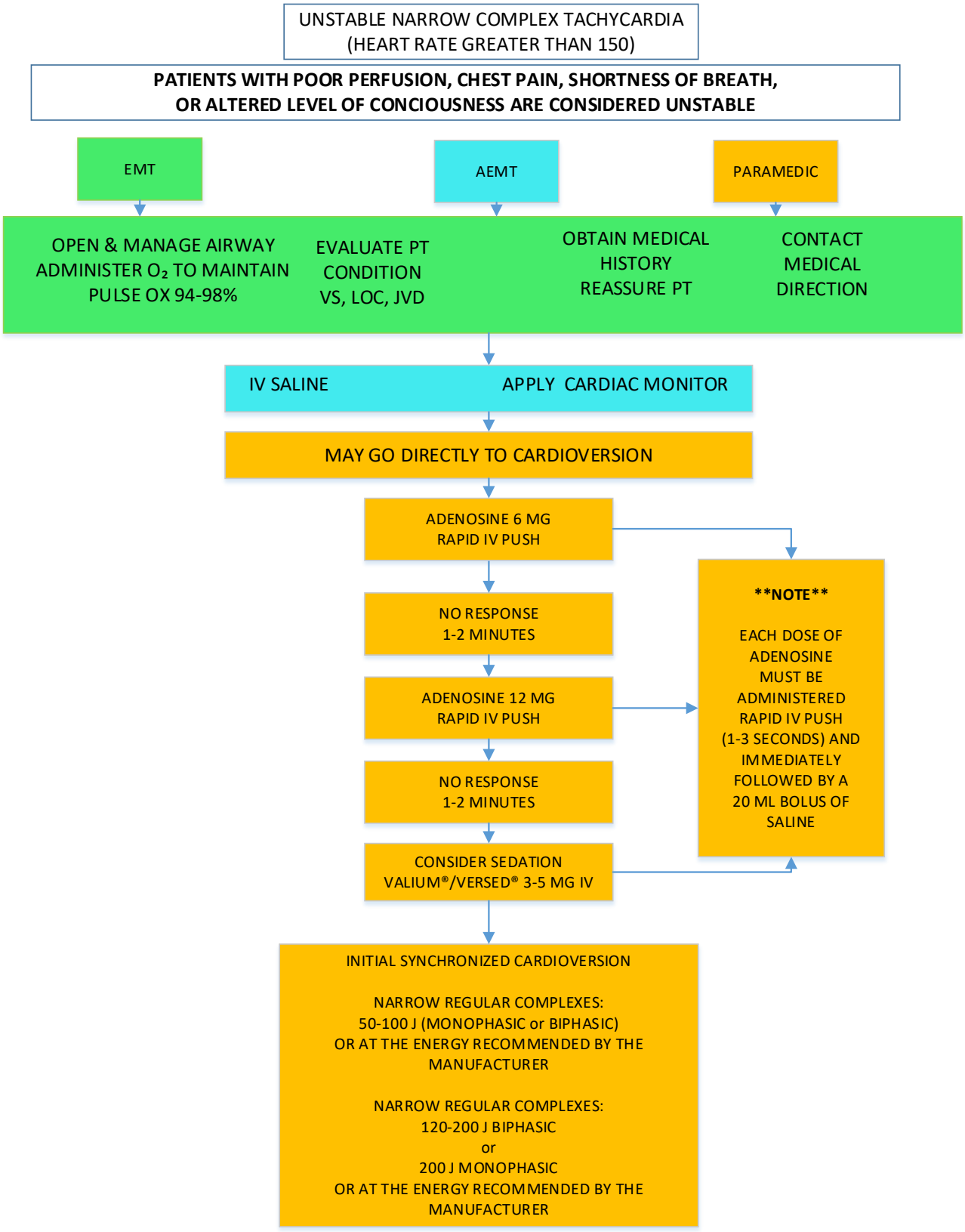
NOTE: If at any time the patient becomes unstable, prepare for immediate cardioversion.

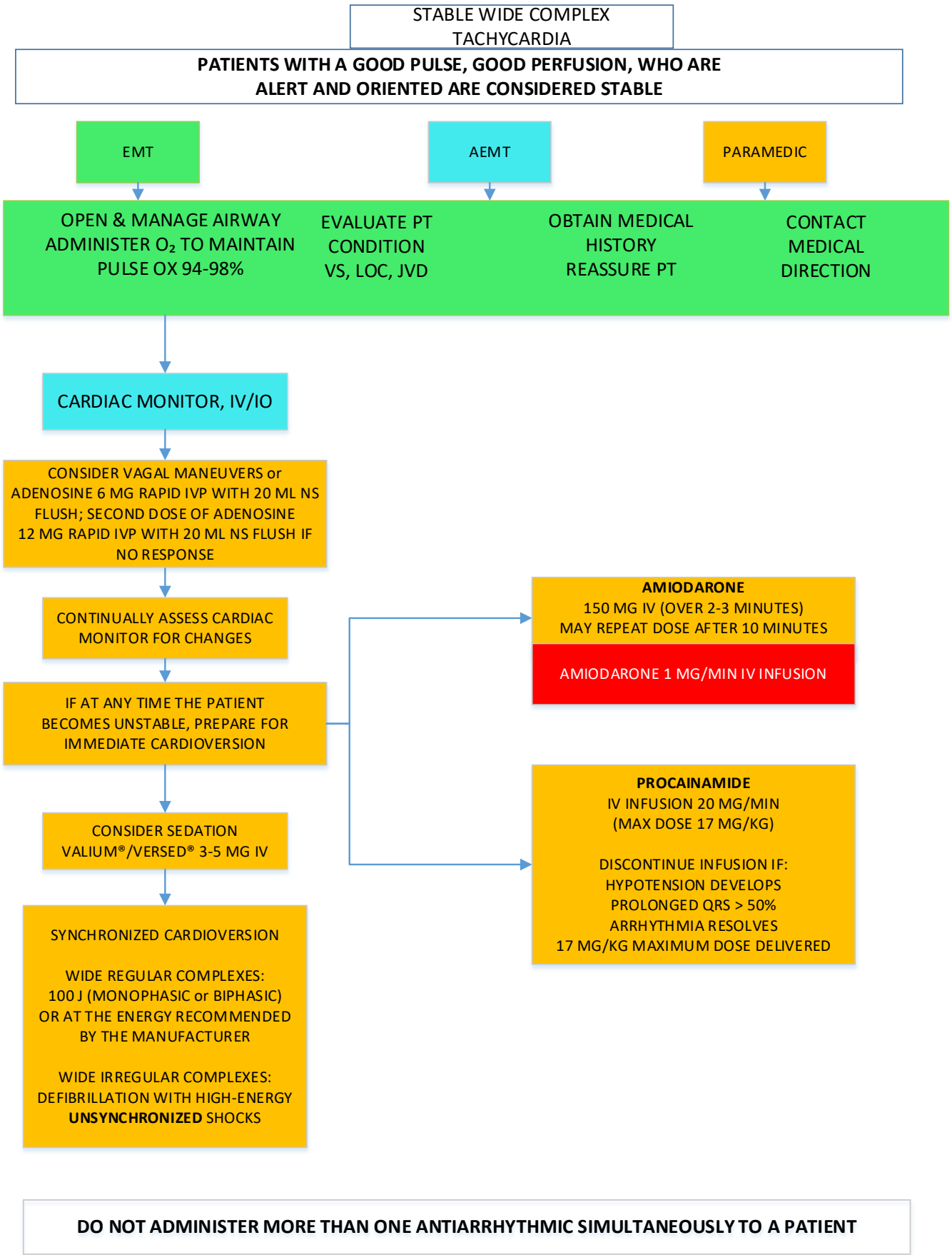
NOTE: Do not administer more than one antiarrhythmic simultaneously to a patient. The choice of the antiarrhythmic to be administered should be predetermined by the medical director for your organization.

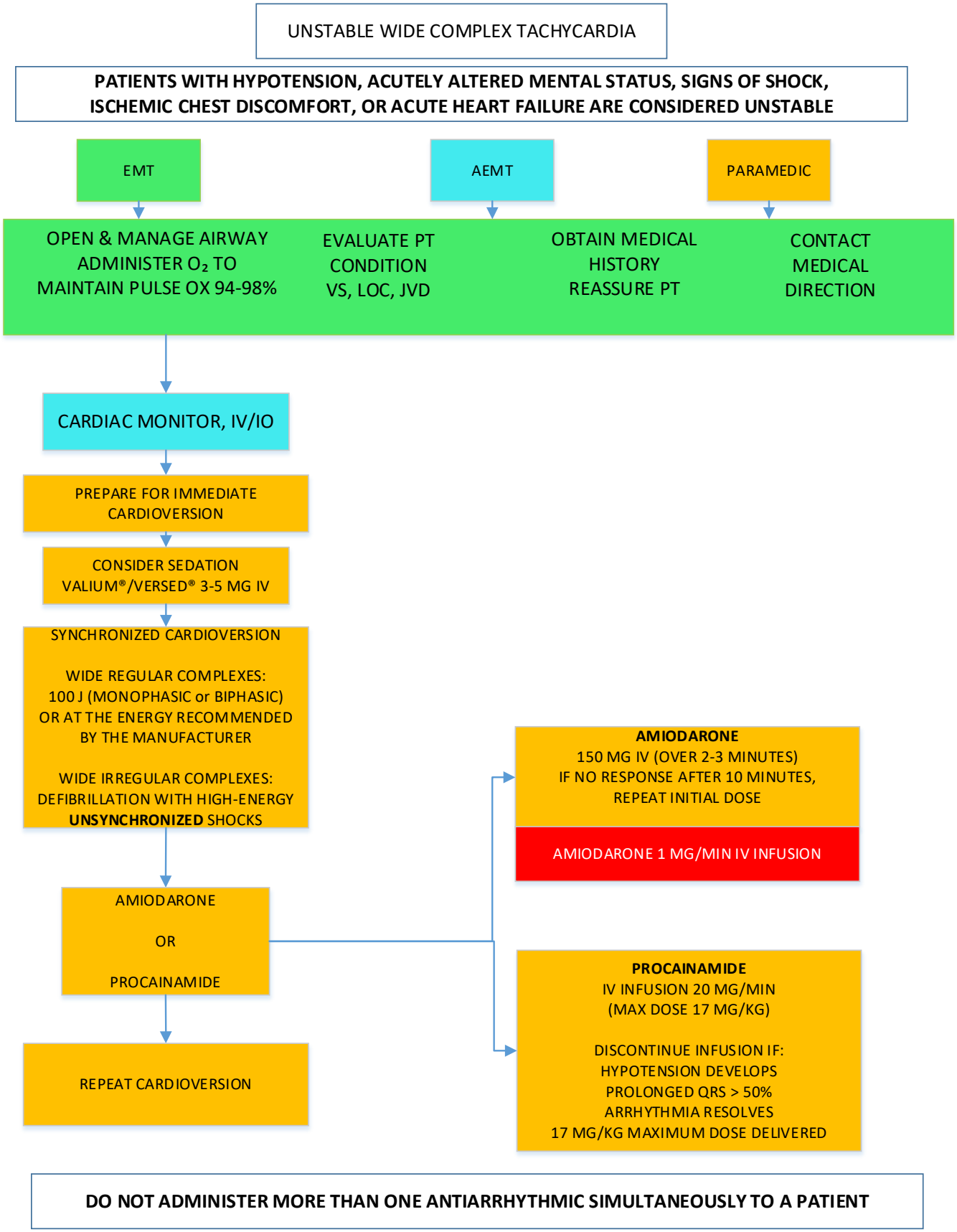
v. Repeat synchronized cardioversion if the patient has a pulse


BRADYCARDIA
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O_2 TO MAINTAIN
PULSE OX 94-98%
EVALUATE PT
CONDITION
VS, LOC, JVD
OBTAIN MEDICAL
HISTORY
REASSURE PT
CONTACT
MEDICAL
DIRECTION
CARDIAC MONITOR, IV/IO
SLOW HEART RATE OF < 60 BPM
ANY OF THE FOLLOWING
SIGNS AND SYMPTOMS PRESENT?
HYPOTENSION
ACUTELY ALTERED MENTAL STATUS
SIGNS OF SHOCK
ISCHEMIC CHEST DISCOMFORT
ACUTE HEART FAILURE
NO
YES
SECOND DEGREE AV BLOCK TYPE II or
THIRD DEGREE AV BLOCK
NO
YES
TRANSPORT
PREPARE FOR
EXTERNAL PACING
IF SIGNS/SYMPTOMS
DEVELOP
ATROPINE 0.5 MG IV q 3-5 MIN
CONTINUED SIGNS/SYMPTOMS
CONSIDER SEDATION
VALIUM®/VERSED® 3-5 MG IV
EXTERNAL PACING
RATE OF 80 BPM
START AT 20 MA
INCREASE MA BY 20 UNTIL
MECHANICAL CAPTURE
CONSIDER NOREPINEPHRINE IV OR
EPINEPHRINE INFUSION OR PUSH DOSE IV


STABLE NARROW COMPLEX TACHYCARDIA
(Heart Rate Greater Than 150)
PATIENTS WITH A PULSE, GOOD PERFUSION AND ALERT AND ORIENTED ARE CONSIDERED STABLE
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O_2 TO MAINTAIN
PULSE OX 94-98%
EVALUATE PT
CONDITION
VS, LOC, JVD
OBTAIN MEDICAL
HISTORY
REASSURE PT
CONTACT
MEDICAL
DIRECTION
VAGAL MANEUVER or CAROTID MASSAGE
CARDIAC MONITOR IV/IO
ADENOSINE 6 MG
RAPID IV PUSH
NO RESPONSE
1-2 MINUTES
ADENOSINE 12 MG
RAPID IV PUSH
NO RESPONSE
1-2 MINUTES
NO RESPONSE
IF PATIENT REMAINS
STABLE, OBSERVE AND
TRANSPORT
NOTE
EACH DOSE OF
ADENOSINE
MUST BE
ADMINISTERED
RAPID IV PUSH
(1-3 SECONDS) AND
IMMEDIATELY
FOLLOWED BY A
20 ML BOLUS OF
SALINE
NOTE
IF AT ANY TIME THE PATIENT BECOMES
UNSTABLE, GO DIRECTLY TO
SYNCHRONOUS CARDIOVERSION
CONSIDER SEDATION
VALIUM®/VERSED® 3-5 MG IV
INITIAL SYNCHRONIZED CARDIOVERSION
NARROW REGULAR COMPLEXES:
50-100 J (MONOPHASIC or BIPHASIC)
OR AT THE ENERGY RECOMMENDED BY THE
MANUFACTURER
NARROW REGULAR COMPLEXES:
120-200 J BIPHASIC
or
200 J MONOPHASIC
OR AT THE ENERGY RECOMMENDED BY THE
MANUFACTURER


UNSTABLE NARROW COMPLEX TACHYCARDIA
(HEART RATE GREATER THAN 150)
PATIENTS WITH POOR PERFUSION, CHEST PAIN, SHORTNESS OF BREATH,
OR ALTERED LEVEL OF CONCIOUSNESS ARE CONSIDERED UNSTABLE
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O2 TO MAINTAIN
PULSE OX 94-98%
EVALUATE PT
CONDITION
VS, LOC, JVD
OBTAIN MEDICAL
HISTORY
REASSURE PT
CONTACT
MEDICAL
DIRECTION
IV SALINE
APPLY CARDIAC MONITOR
MAY GO DIRECTLY TO CARDIOVERSION
ADENOSINE 6 MG
RAPID IV PUSH
NO RESPONSE
1-2 MINUTES
ADENOSINE 12 MG
RAPID IV PUSH
NO RESPONSE
1-2 MINUTES
CONSIDER SEDATION
VALIUM®/VERSED® 3-5 MG IV
NOTE
EACH DOSE OF
ADENOSINE
MUST BE
ADMINISTERED
RAPID IV PUSH
(1-3 SECONDS) AND
IMMEDIATELY
FOLLOWED BY A
20 ML BOLUS OF
SALINE
INITIAL SYNCHRONIZED CARDIOVERSION
NARROW REGULAR COMPLEXES:
50-100 J (MONOPHASIC or BIPHASIC)
OR AT THE ENERGY RECOMMENDED BY THE
MANUFACTURER
NARROW REGULAR COMPLEXES:
120-200 J BIPHASIC
or
200 J MONOPHASIC
OR AT THE ENERGY RECOMMENDED BY THE
MANUFACTURER


STABLE WIDE COMPLEX TACHYCARDIA
PATIENTS WITH A GOOD PULSE, GOOD PERFUSION, WHO ARE ALERT AND ORIENTED ARE CONSIDERED STABLE
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY ADMINISTER O_2 TO MAINTAIN PULSE OX 94-98%
EVALUATE PT CONDITION VS, LOC, JVD
OBTAIN MEDICAL HISTORY REASSURE PT
CONTACT MEDICAL DIRECTION
CARDIAC MONITOR, IV/IO
CONSIDER VAGAL MANEUVERS or ADENOSINE 6 MG RAPID IVP WITH 20 ML NS FLUSH; SECOND DOSE OF ADENOSINE 12 MG RAPID IVP WITH 20 ML NS FLUSH IF NO RESPONSE
CONTINUALLY ASSESS CARDIAC MONITOR FOR CHANGES
IF AT ANY TIME THE PATIENT BECOMES UNSTABLE, PREPARE FOR IMMEDIATE CARDIOVERSION
CONSIDER SEDATION VALIUM®/VERSED® 3-5 MG IV
SYNCHRONIZED CARDIOVERSION
WIDE REGULAR COMPLEXES: 100 J (MONOPHASIC or BIPHASIC) OR AT THE ENERGY RECOMMENDED BY THE MANUFACTURER
WIDE IRREGULAR COMPLEXES: DEFIBRILLATION WITH HIGH-ENERGY UNSYNCHRONIZED SHOCKS
AMIODARONE
150 MG IV (OVER 2-3 MINUTES)
MAY REPEAT DOSE AFTER 10 MINUTES
AMIODARONE 1 MG/MIN IV INFUSION
PROCAINAMIDE
IV INFUSION 20 MG/MIN
(MAX DOSE 17 MG/KG)
DISCONTINUE INFUSION IF:
HYPOTENSION DEVELOPS
PROLONGED QRS > 50%
ARRHYTHMIA RESOLVES
17 MG/KG MAXIMUM DOSE DELIVERED
DO NOT ADMINISTER MORE THAN ONE ANTIARRHYTHMIC SIMULTANEOUSLY TO A PATIENT


UNSTABLE WIDE COMPLEX TACHYCARDIA
PATIENTS WITH HYPOTENSION, ACUTELY ALTERED MENTAL STATUS, SIGNS OF SHOCK, ISCHEMIC CHEST DISCOMFORT, OR ACUTE HEART FAILURE ARE CONSIDERED UNSTABLE
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O2 TO
MAINTAIN PULSE OX 94-98%
EVALUATE PT
CONDITION
VS, LOC, JVD
OBTAIN MEDICAL
HISTORY
REASSURE PT
CONTACT
MEDICAL
DIRECTION
CARDIAC MONITOR, IV/IO
PREPARE FOR IMMEDIATE
CARDIOVERSION
CONSIDER SEDATION
VALIUM®/VERSED® 3-5 MG IV
SYNCHRONIZED CARDIOVERSION
WIDE REGULAR COMPLEXES:
100 J (MONOPHASIC or BIPHASIC)
OR AT THE ENERGY RECOMMENDED
BY THE MANUFACTURER
WIDE IRREGULAR COMPLEXES:
DEFIBRILLATION WITH HIGH-ENERGY
UNSYNCHRONIZED SHOCKS
AMIODARONE
OR
PROCAINAMIDE
REPEAT CARDIOVERSION
AMIODARONE
150 MG IV (OVER 2-3 MINUTES)
IF NO RESPONSE AFTER 10 MINUTES,
REPEAT INITIAL DOSE
AMIODARONE 1 MG/MIN IV INFUSION
PROCAINAMIDE
IV INFUSION 20 MG/MIN
(MAX DOSE 17 MG/KG)
DISCONTINUE INFUSION IF:
HYPOTENSION DEVELOPS
PROLONGED QRS > 50%
ARRHYTHMIA RESOLVES
17 MG/KG MAXIMUM DOSE DELIVERED
DO NOT ADMINISTER MORE THAN ONE ANTIARRHYTHMIC SIMULTANEOUSLY TO A PATIENT

BURNS

GENERAL INFORMATION

A. The first priority is to assure scene safety and then remove the patient from heat and flame, electrical, or chemical exposure. Fires in enclosed spaces increase the risk for cyanide toxicity.

B. Airway, breathing, and circulation must be stabilized before attending to the burn

C. Patient with extensive burns must be monitored for hypothermia and the use of ice and/or prolonged cold compresses should be avoided. When in doubt, always cover with dry dressing.

D. In caring for the burn, the EMS professional should:
   1. Stop the burning
   2. Reduce the pain
   3. Prevent contamination

E. Patients with critical burns must be transported per local protocol.

F. When dealing with contaminated environments, EMS professionals must have appropriate protective clothing. If not available, contact appropriate hazardous materials (HAZMAT) service for such equipment.

G. Gross decontamination must be done at the scene. Advise receiving facility if complete decontamination was not done at the scene, and be prepared to transport to decontamination area.

EMT

A. Open and manage airway and provide oxygen as appropriate.

B. Determine type of burn and treat as follows:
   1. Thermal (dry and moist):
      a. Stop burning process: i.e. remove patient from heat source, cool skin, remove clothing
      b. If patient starts to shiver or skin is cool, stop cooling process
      c. Estimate extent (% of body surface area) and depth of burn (see chart). Determine seriousness of burn (see chart). Contact medical direction and transport accordingly.
      d. Cover burn areas with sterile dressing

   2. Radiation Burns:
      a. Treat as thermal burns except when the burn is contaminated with a radioactive source. If contaminated with radioactive material, treat as chemical burn
      b. Wear appropriate protective clothing when dealing with contamination
      c. Contact HAZMAT team for assistance in contamination cases

3. Chemical Burns:

   a. EMS professionals must wear appropriate protective clothing and respirators
   b. Remove patient from contaminated area and move the patient to the decontamination site (Do not move the patient directly into the squad)
   c. Determine chemicals involved; contact appropriate agency for chemical information
   d. Remove patient's clothing and flush skin
   e. Leave contaminated clothes at scene. Cover patient over and under before loading into squad.
   f. Patient should be transported by personnel not involved in decontamination process
   g. Determine severity (see chart), contact medical direction and transport accordingly
   h. Relay type of substance involved to medical direction.

4. Electrical Burns

   a. Shut down electrical source; do not attempt to remove patient until electricity is confirmed to be completely turned off.
   b. Assess for visible entrance and exit wounds and treat as thermal burns
   c. Assess for internal injury, i.e., vascular damage, tissue damage, fractures, and treat accordingly
   d. Determine severity of burn, contact medical direction and transport accordingly

5. Inhalation Burns:

   a. Always suspect inhalation burns when the patient is found in closed smoky environment and/or exhibits any of the following: burns to face/neck, singed nasal hairs, cough and/or stridor, soot in sputum,
   b. Provide oxygen therapy, contact medical direction and transport

AEMT

A. Assist EMS professional with airway. Intubate if necessary per the endotracheal intubation guideline

B. Assist in determining type of burn and its treatment

C. For hypovolemia, start IV per shock guideline

DO NOT DELAY TRANSPORT FOR IV PLACEMENT

PARAMEDIC

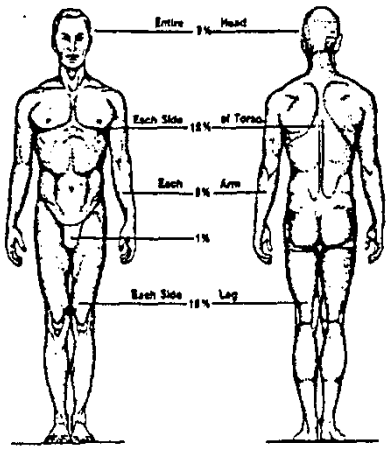
A. Assume charge and confer with EMS professionals about patient condition and circumstances

B. Apply cardiac monitor and treat arrhythmia, especially with electrical burns

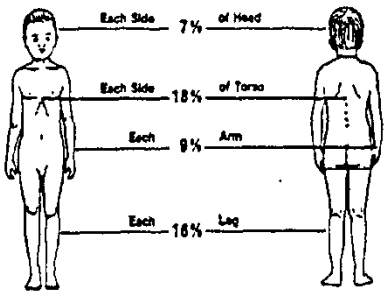
C. Provide endotracheal intubation per the endotracheal intubation guideline if clinically indicated

D. Consider pain relief per local protocol.

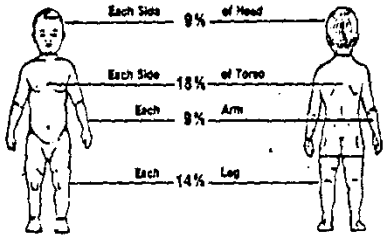
RULE OF NINES



Percentage of Adult Body Surface



Percentage of Child Body Surface



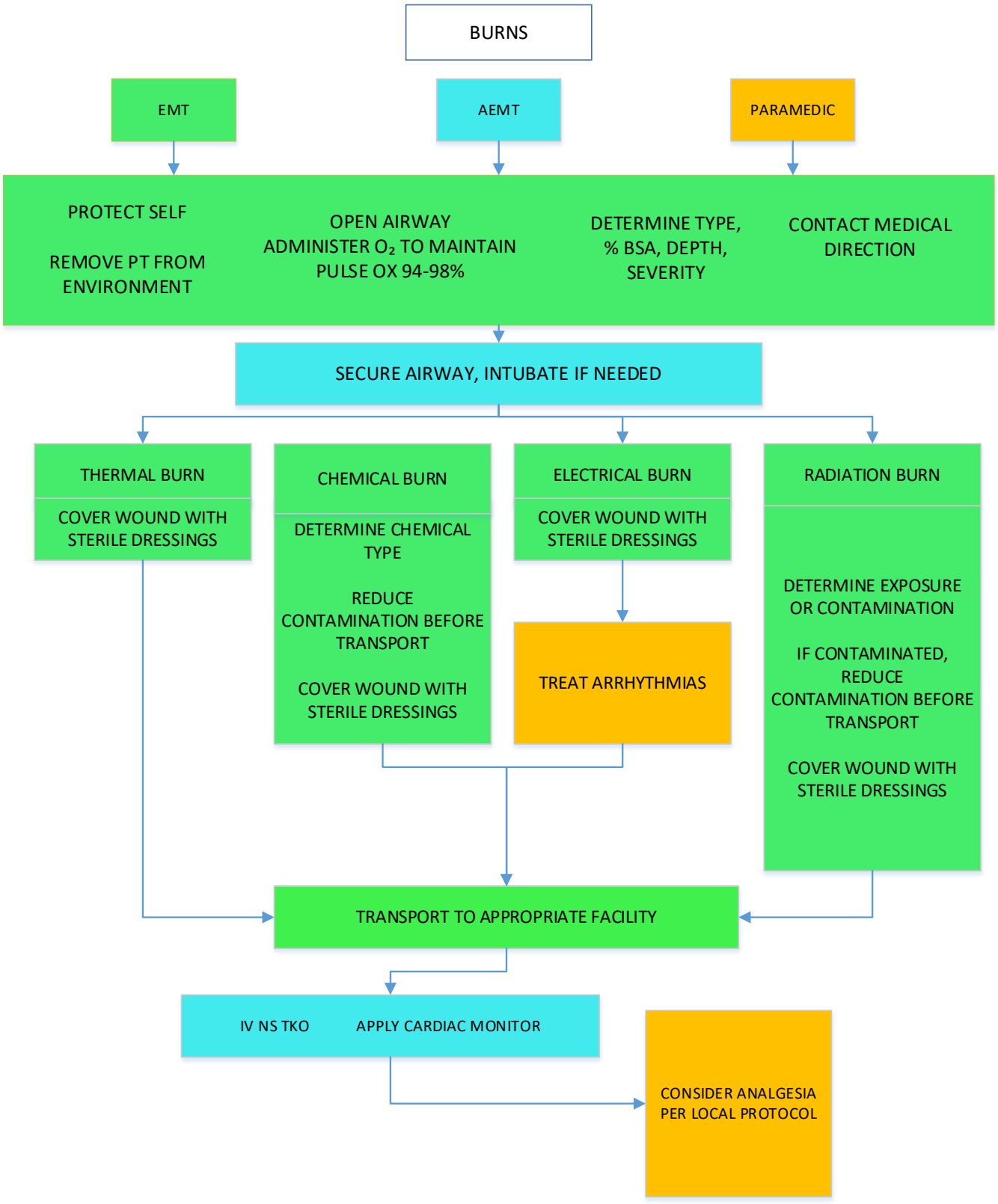
Percentage of Infant Body Surface

NOTE: 1% is equal to the surface of the palm of the patient's hand. If unsure of %, describe injured area.

SERIOUSNESS OF BURNS

MINOR	MODERATE	CRITICAL
1st degree < 70%	1st degree > 70%	2nd degree > 30%
2nd degree < 10%	*2nd degree 10-30%	3rd degree > 2%
*3rd degree < 2%		Any burns with trauma.
		Any burns with involvement of head, face, hands, feet, or genitalia

*Only if face, hands, feet or genitalia are **not** involved.


BURNS
EMT
AEMT
PARAMEDIC
PROTECT SELF
REMOVE PT FROM ENVIRONMENT
OPEN AIRWAY
ADMINISTER O_2 TO MAINTAIN PULSE OX 94-98%
DETERMINE TYPE, % BSA, DEPTH, SEVERITY
CONTACT MEDICAL DIRECTION
SECURE AIRWAY, INTUBATE IF NEEDED
THERMAL BURN
COVER WOUND WITH STERILE DRESSINGS
CHEMICAL BURN
DETERMINE CHEMICAL TYPE
REDUCE CONTAMINATION BEFORE TRANSPORT
COVER WOUND WITH STERILE DRESSINGS
ELECTRICAL BURN
COVER WOUND WITH STERILE DRESSINGS
TREAT ARRHYTHMIAS
RADIATION BURN
DETERMINE EXPOSURE OR CONTAMINATION
IF CONTAMINATED, REDUCE CONTAMINATION BEFORE TRANSPORT
COVER WOUND WITH STERILE DRESSINGS
TRANSPORT TO APPROPRIATE FACILITY
IV NS TKO
APPLY CARDIAC MONITOR
CONSIDER ANALGESIA PER LOCAL PROTOCOL

GENERAL INSTRUCTIONS

A. Quality CPR should be initiated immediately and should not be interrupted for more than 15 seconds, including for advanced airway management, until a spontaneous pulse is established.
Compression Ratio for Adult - 30:2
Consider administration of two minutes of quality CPR prior to defibrillation.

B. Quantitative waveform capnography is recommended for monitoring the quality of CPR (with the goal of maintaining end tidal CO_2 (P_{ETCO2}) greater than 10 mmHg), detection of the return of spontaneous circulation, and is required for the confirmation of tracheal tube placement. Hyperventilation should be avoided and tidal volumes should be limited.

C. If IV/IO cannot be established, epinephrine, and atropine may be administered through the endotracheal tube.

D. When a defibrillator (automated or manual) is immediately available, a single shock should be delivered, if indicated after assessment and a shockable rhythm identified.

E. If there is no response to an adequate trial of ALS on scene or if the end tidal CO_2 remains low (P_{ETCO2} less than 10 mmHg) in an intubated patient after 20 minutes of CPR with other factors as determined by the medical director, termination of resuscitation should be considered (see Termination of Resuscitation guideline).

F. Each IV/IO push medication should be followed by a 20 ml NS or LR flush.

G. The ideal defibrillation dose using a biphasic defibrillator is the dose at which the device waveform has been shown to be effective in terminating VF. If this information is not readily available, defibrillations should be administered at 200 J. if the patient remains clinically unchanged following defibrillation, CPR should resume immediately in a quality manner by ensuring adequate depth of chest compressions, adequate time for chest recoil, and rotating rescuers or using a mechanical chest compression device to mitigate physical fatigue of the responders tasked with performing CPR.

H. The induction of targeted temperature management following a successful resuscitation with a target temperature between 32°C and 36°C may be considered if the patient can be transported to a facility that can continue this therapeutic measure. The infusion of cold IV fluids is not recommended.

I. The acquisition and/or transmission of a 12-lead EKG, completed in accordance with the Ohio EMS scope of practice, following a successful resuscitation should be considered. If the 12-lead EKG demonstrates an acute ST segment myocardial infarction (STEMI), medical direction should be contacted immediately to facilitate the patient's transport to directly to a facility with percutaneous cardiac intervention (PCI) capability if possible.

J. In patients who are comatose following an out-of-hospital cardiac arrest of suspected cardiac origin and have a 12-lead EKG that does not demonstrate a STEMI, medical direction should be contacted immediately to potentially facilitate the patient's transport directly to a facility with PCI capability.

K. Pulseless patients or those with a weak or slow pulse following a known or suspected opioid overdose should be managed as cardiac arrest patients. Standard resuscitative measures should be initiated immediately and should take priority over naloxone administration or waiting for a response from previously administered naloxone.

L. The provision of standard resuscitative measures is a top priority in pregnant patients in cardiac arrest. Relief of aortocaval compression can be achieved with manual uterine displacement to the left if the fundal height is at or above the umbilicus.

EMT

A. If an Automated External Defibrillator (AED) is available:

1. Assess patient for respiratory and cardiac arrest

2. Immediately provide quality CPR

3. Apply AED and activate device. Start verbal documentation which must include:

- EMS unit delivering care and ID of EMT
- Initial call information (i.e. man down, drowning, etc.)
- Initial patient assessment, findings, and impression
- Care given to this point
- Ongoing outcomes of care delivered to patient

a. "No Shock Advised"
   i. Resume quality CPR
   ii. Ventilate with 100% oxygen by two-person BVM of oxygen-powered, manually-triggered ventilation device and an oral or nasal airway adjunct. Ventilation should be delivered over two seconds.
   iii. Contact medical direction and advise of cardiac arrest
   iv. Transport immediately unless an advanced life support unit is enroute and has ETA less than 5 minutes

b. "Shock Advised"
   i. Deliver single shock
   ii. Resume quality CPR for two minutes. Manage airway and oxygenate.
   iii. Contact medical direction and advise of cardiac arrest
   iv. After two minutes of quality CPR, analyze the rhythm with the AED and deliver a single shock, if indicated
      - Defibrillate 120-200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer
   v. Continue quality CPR and transport patient to ambulance

TURN AED OFF DURING PATIENT MOVEMENT

   vi. Before transport – analyze the rhythm with the AED and deliver single shock, if indicated
      - Defibrillate 120-200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer
   vii. Transport immediately unless an advanced life support unit is enroute and has ETA less than 5 minutes
   viii. If the patient is pulseless and apneic, consider the insertion of a dual lumen or extraglottic airway device

AEMT

A. Assume charge and confer with EMS professional as to patient condition and circumstances

ALLOWS AED TO COMPLETE "SHOCK" SEQUENCE IF IN PROGRESS

B. Apply cardiac monitor and check rhythm

C. If monitor shows ventricular fibrillation or pulseless ventricular tachycardia:

1. Defibrillate with 200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer
2. Deliver two minutes of quality CPR.
3. Check rhythm
4. Defibrillate with 200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer
5. Resume quality CPR, manage the patient's airway and provide 100% oxygen, start NS IV/IO, contact medical direction and advise of patient condition
6. Continue quality CPR
7. Assess rhythm and pulse
8. No change – defibrillate with 200 J biphasic or 360J monophasic or at the energy level recommended by the manufacturer
9. Assess rhythm and pulse, no change
10. Resume quality CPR
11. No change – defibrillate with 200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer

D. After an advanced airway is placed, rescuers no longer deliver "cycles" of CPR. Give continuous chest compressions without pauses for breaths. Give 10 breaths/minute. Check rhythm every two minutes.

PARAMEDIC

A. Assume charge and confer with EMS professional as to patient condition and circumstances

ALLOWS AED TO COMPLETE "SHOCK" SEQUENCE IF IN PROGRESS
ALLOWS AEMT TO COMPLETE MANUAL DEFIBRILLATION CYCLE IN PROGRESS

B. Apply cardiac monitor and check rhythm

C. If monitor shows ventricular fibrillation of pulseless ventricular tachycardia:

1. Defibrillate with 200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer
2. Deliver two minutes of quality CPR.
3. Check rhythm
4. Defibrillate with 200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer
5. Resume quality CPR, manage patient's airway and provide 100% oxygen, start NS IV/IO, contact medical direction, and advise of patient condition

6. Administer epinephrine 1 mg (0.1mg/1ml) IV/IO every 3-5 min

7. Resume quality CPR

8. Assess rhythm and pulse

9. If no change, defibrillate with 200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer

10. Assess rhythm and pulse. If no change, continues quality CPR

11. Administer antiarrhythmic

    - Amiodarone 300 mg IV/IO (second dose 150 mg IV/IO)
    - If amiodarone is not available, lidocaine 1-1.5 mg/kg IV/IO [(second dose 0.5 - 0.75 mg/kg IV/IO) max 3 mg/kg]
    - Magnesium 1-2 g IV/IO (only for torsades de pointes)

12. Continue CPR

13. Assess rhythm and pulse

14. If no change, defibrillate with 200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer

D. After an advanced airway is placed, rescuers no longer deliver “cycles” of CPR. Provide continuous chest compressions without pauses for breaths. Provide 10 breaths/minute. Check rhythm every two minutes.

E. Consider reversible causes:
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypokalemia/Hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade (cardiac)
- Toxins
- Thrombosis (pulmonary)
- Thrombosis (coronary)

NOTE: Value of sodium bicarbonate has not been demonstrated during cardiac arrest, and it is not recommended for the routine cardiac arrest sequence. Consideration of its use is appropriate with during special resuscitation situations only, specifically when preexisting metabolic acidosis, hyperkalemia, or tricyclic antidepressant overdose is suspected.

Pulseless Electrical Activity (PEA)/Asystole

a. Check pulse, immediately initiate quality CPR, and minimize any interruption in CPR

b. Apply the cardiac monitor/defibrillator and reassess rhythm every 2 minutes

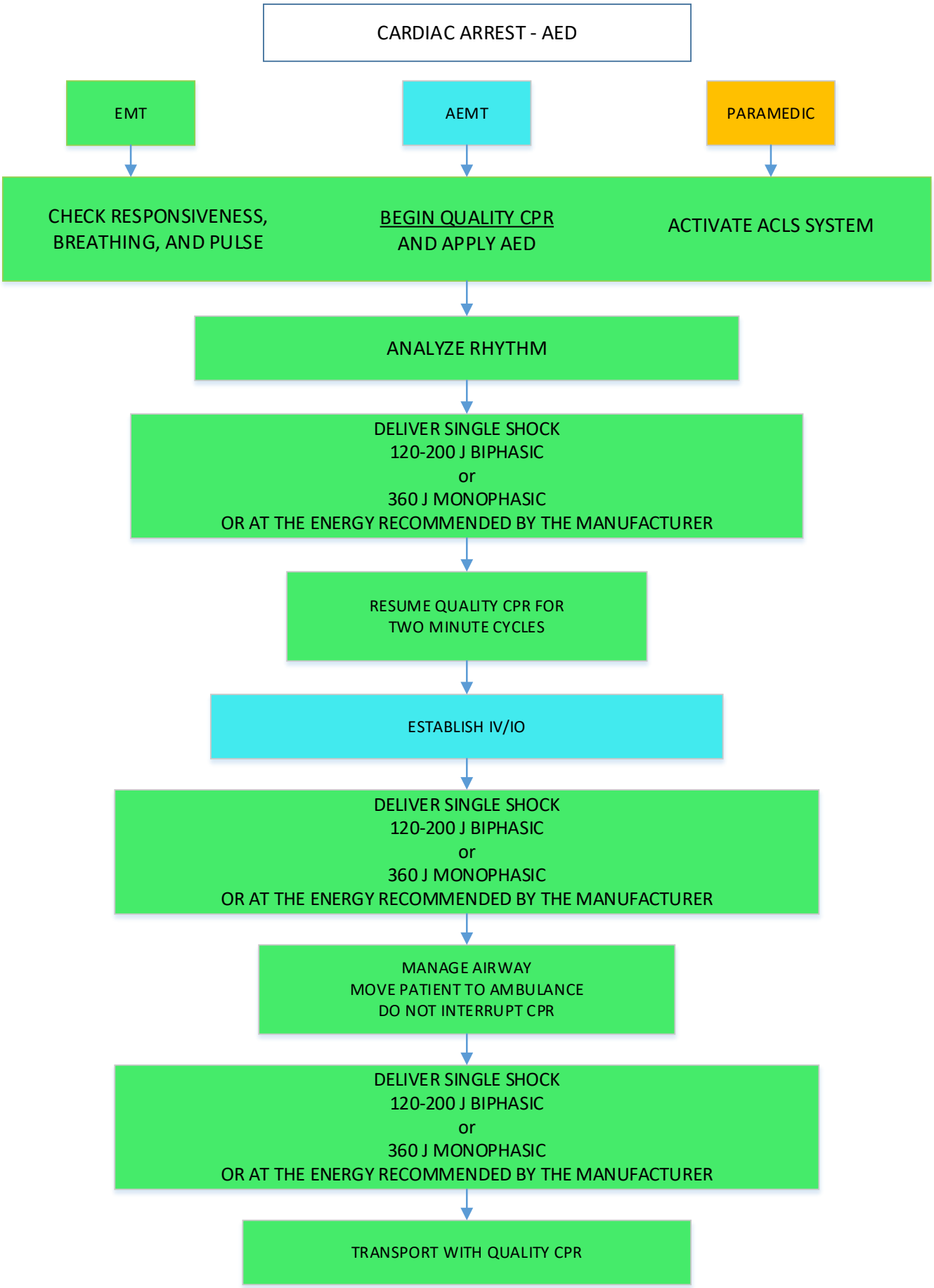
c. Obtain IV/IO access

d. Administer epinephrine 1 mg (0.1mg/1ml) IVP immediately (with a goal of within 1 to 3 minutes) for patients who present with an initial non-shockable rhythm with repeat doses every 3 to 5 minutes. Administer epinephrine 1 mg (0.1mg/1ml) IVP every 3 to 5 minutes to patients who present with an initial shockable rhythm

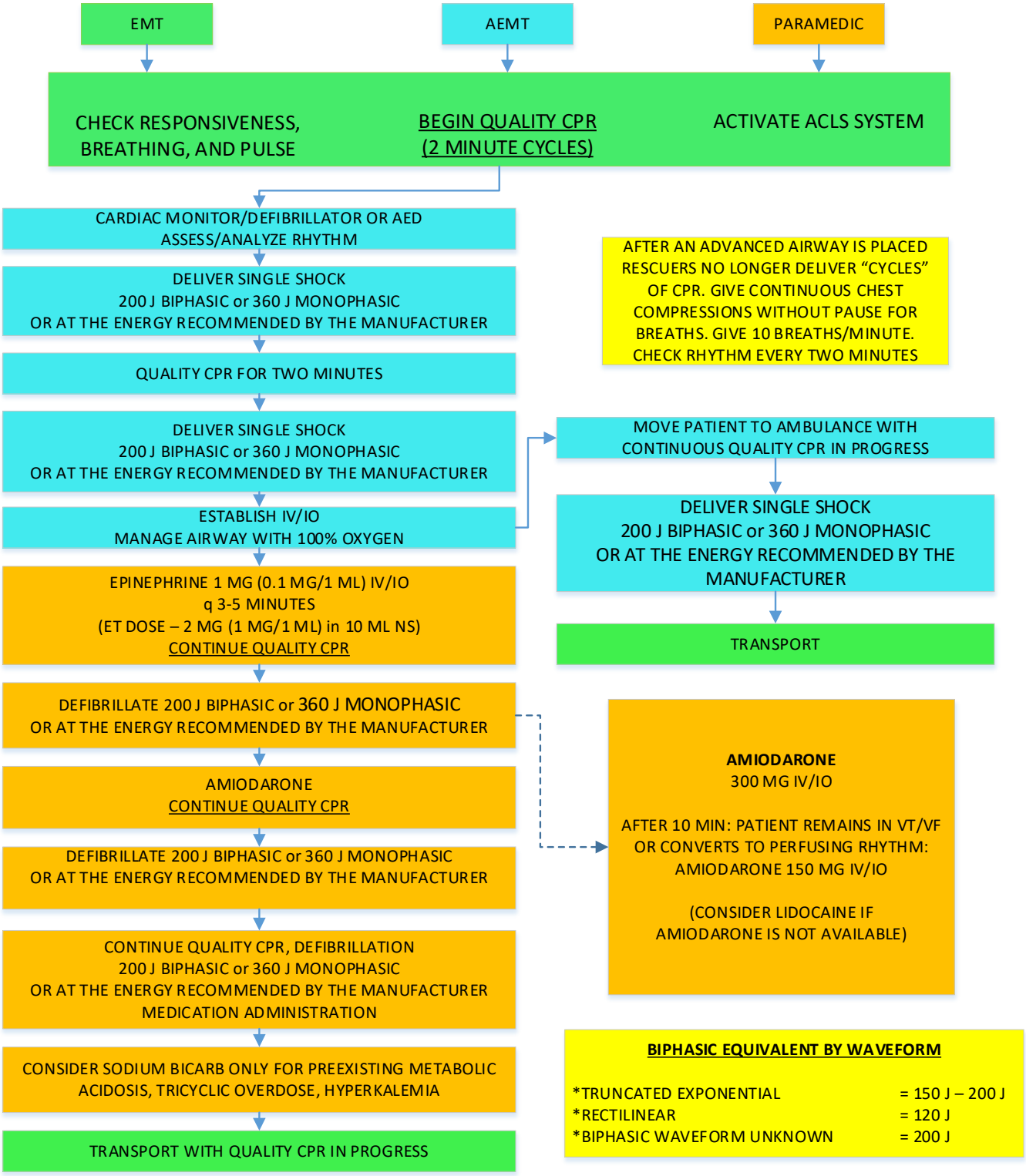
e. Consider placement of an advanced airway

f. Epinephrine 2 mg to 2.5 mg (1mg/1ml) diluted with NS 10 ml may be administered via an ETT if IV/IO access has not be obtained or is delayed

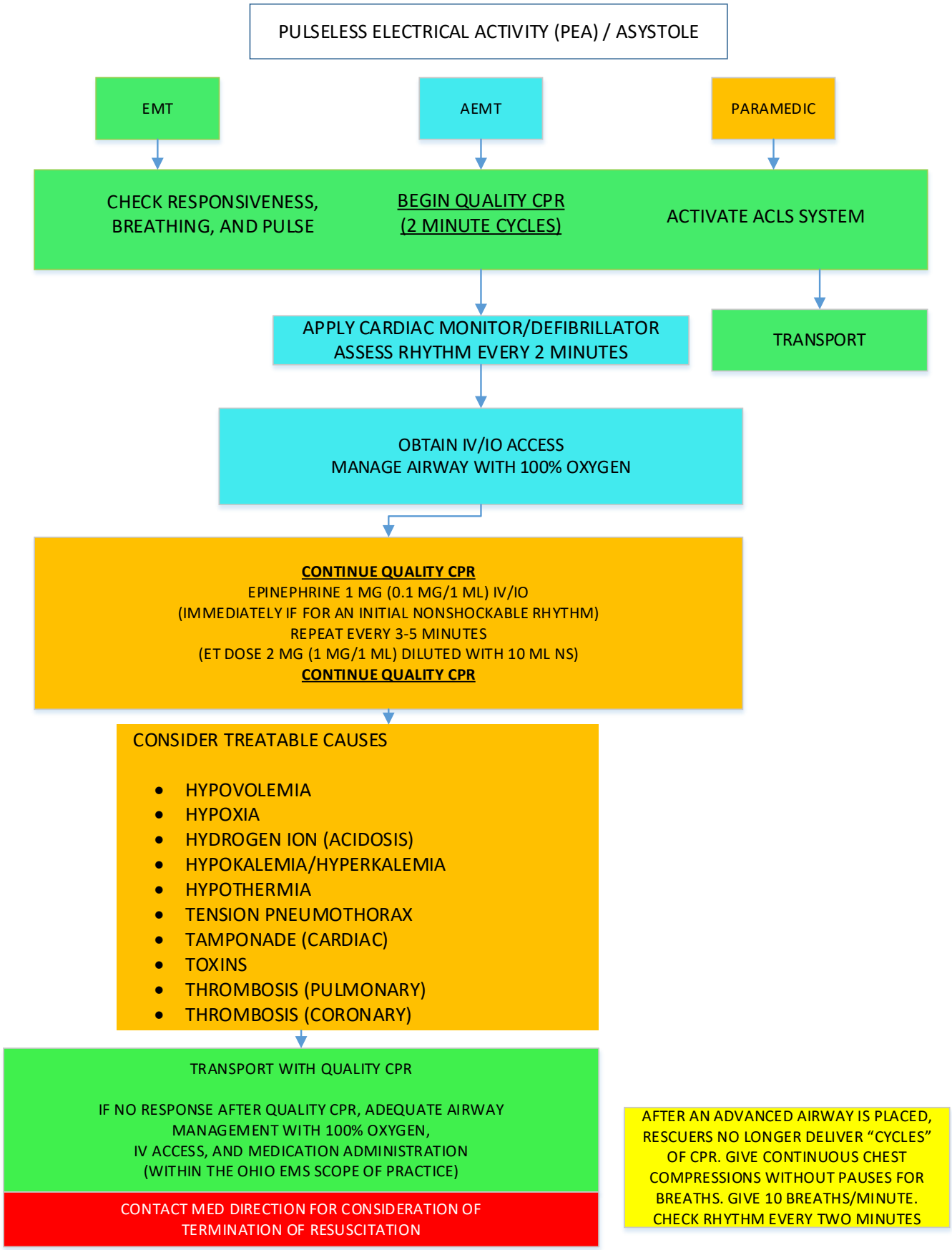
g. Consider treatable causes:
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypokalemia/Hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade (cardiac)
- Toxins
- Thrombosis (pulmonary)
- Thrombosis (coronary)


CARDIAC ARREST - AED
EMT
AEMT
PARAMEDIC
CHECK RESPONSIVENESS, BREATHING, AND PULSE
BEGIN QUALITY CPR AND APPLY AED
ACTIVATE ACLS SYSTEM
ANALYZE RHYTHM
DELIVER SINGLE SHOCK
120-200 J BIPHASIC
or
360 J MONOPHASIC
OR AT THE ENERGY RECOMMENDED BY THE MANUFACTURER
RESUME QUALITY CPR FOR
TWO MINUTE CYCLES
ESTABLISH IV/IO
DELIVER SINGLE SHOCK
120-200 J BIPHASIC
or
360 J MONOPHASIC
OR AT THE ENERGY RECOMMENDED BY THE MANUFACTURER
MANAGE AIRWAY
MOVE PATIENT TO AMBULANCE
DO NOT INTERRUPT CPR
DELIVER SINGLE SHOCK
120-200 J BIPHASIC
or
360 J MONOPHASIC
OR AT THE ENERGY RECOMMENDED BY THE MANUFACTURER
TRANSPORT WITH QUALITY CPR

CARDIAC ARREST
VENTRICULAR FIBRILLATION/PULSELESS VENTRICULAR TACHYCARDIA



DO NOT ADMINISTER MORE THAN ONE ANTIARRHYTHMIC TO A PATIENT


PULSELESS ELECTRICAL ACTIVITY (PEA) / ASYSTOLE
EMT
AEMT
PARAMEDIC
CHECK RESPONSIVENESS, BREATHING, AND PULSE
BEGIN QUALITY CPR (2 MINUTE CYCLES)
ACTIVATE ACLS SYSTEM
APPLY CARDIAC MONITOR/DEFIBRILLATOR ASSESS RHYTHM EVERY 2 MINUTES
TRANSPORT
OBTAIN IV/IO ACCESS
MANAGE AIRWAY WITH 100% OXYGEN
CONTINUE QUALITY CPR
EPINEPHRINE 1 MG (0.1 MG/1 ML) IV/IO
(IMMEDIATELY IF FOR AN INITIAL NONSHOCKABLE RHYTHM)
REPEAT EVERY 3-5 MINUTES
(ET DOSE 2 MG (1 MG/1 ML) DILUTED WITH 10 ML NS)
CONTINUE QUALITY CPR
CONSIDER TREATABLE CAUSES
HYPOVOLEMIA
HYPOXIA
HYDROGEN ION (ACIDOSIS)
HYPOKALEMIA/HYPERKALEMIA
HYPOTHERMIA
TENSION PNEUMOTHORAX
TAMPONADE (CARDIAC)
TOXINS
THROMBOSIS (PULMONARY)
THROMBOSIS (CORONARY)
TRANSPORT WITH QUALITY CPR
IF NO RESPONSE AFTER QUALITY CPR, ADEQUATE AIRWAY MANAGEMENT WITH 100% OXYGEN, IV ACCESS, AND MEDICATION ADMINISTRATION (WITHIN THE OHIO EMS SCOPE OF PRACTICE)
CONTACT MED DIRECTION FOR CONSIDERATION OF TERMINATION OF RESUSCITATION
AFTER AN ADVANCED AIRWAY IS PLACED, RESCUERS NO LONGER DELIVER "CYCLES" OF CPR. GIVE CONTINUOUS CHEST COMPRESSIONS WITHOUT PAUSES FOR BREATHS. GIVE 10 BREATHS/MINUTE. CHECK RHYTHM EVERY TWO MINUTES

SPECIAL RESUSCITATION CONSIDERATIONS

Special resuscitation situations are cardiopulmonary arrest or other life-threatening emergency that require modification or extension of conventional life support techniques.

CARDIAC ARREST
ELECTROCUTION/LIGHTNING STRIKE

A. Ensure scene safety and, if possible, turn off the source of electricity

B. Defibrillate the victim immediately as soon as a defibrillator or AED is available even it results in the disruption of cycles of CPR

C. If the victim does not respond to three defibrillations, follow the cardiac arrest guideline and do not delay transport

CARDIAC ARREST
NEAR DROWNING

GENERAL INFORMATION

A. The key to success is the provision of early, effective pulmonary support

B. It is essential that the EMS professional exercise caution and take steps to insure their own safety while retrieving the victim from the water

C. Drowning is classified as trauma in Ohio. Victims of drowning or near drowning that could require admission to a hospital should be transferred to the appropriate trauma center.

D. Maintenance of hypothermia in cold-water drowning may recommended by local medical direction if the patient can be transported to facility that is capable of continuing this therapeutic measure. A drowning that occurs in a body of water that is located outdoors or is not artificially heated should be classified as a cold-water drowning.

EMT

A. Open airway and start rescue breathing as soon as possible even if the victim has not been removed from the water

B. Ventilate with 100% oxygen by two-person BVM or oxygen-powered, manually-triggered or automatic transport ventilation device with an oral or nasal airway adjunct. Oxygen should be warmed to 42°C, if possible. Ventilation should be delivered over two seconds and cricoid pressure should be considered to help reduce gastric distension

C. Always consider the possibility of a cervical spine injury

D. It is not recommended to drain fluid from lungs unless ventilations are impaired. If ventilation impairment should occur, suction airway for not more than 15 seconds

E. Start quality CPR as soon as victim is removed from the water and onto hard surface

F. Patient may show signs of hypothermia. Handle patient very gently as rough handling or movement can cause cardiac arrhythmias. Warm patient by removing wet clothes and cover with blankets

G. Transport immediately

AEMT

A. Assume charge and confer with the EMS professional as to patient condition and circumstance

B. Apply cardiac monitor and assess rhythm. Follow cardiac arrest guideline.

C. Start IV of saline, warmed to 46° C if possible.

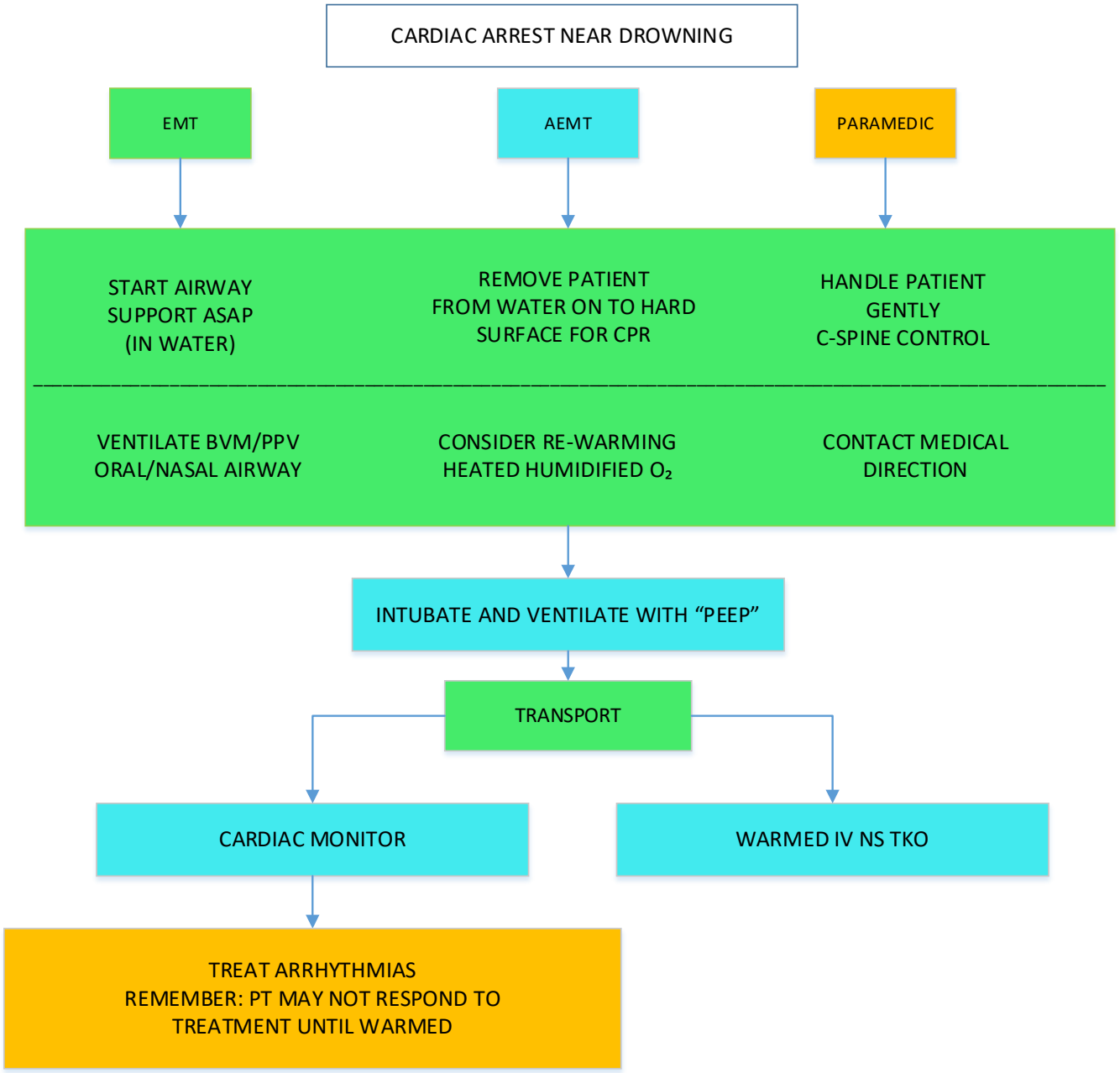
D. Check pulse, intubate patient, suction airway, and provide ventilation with positive end-expiratory pressure (PEEP). Continue quality CPR.

PARAMEDIC

A. Assume charge and confer with the EMS professional as to patient condition and circumstance

B. If EMS professional is in a cycle of defibrillation, allow to complete the cycle before continuing resuscitative measures

C. Apply cardiac monitor and assess rhythm. Follow hypothermia cardiac arrest guideline


CARDIAC ARREST NEAR DROWNING
EMT
AEMT
PARAMEDIC
START AIRWAY SUPPORT ASAP (IN WATER)
REMOVE PATIENT FROM WATER ON TO HARD SURFACE FOR CPR
HANDLE PATIENT GENTLY C-SPINE CONTROL
VENTILATE BVM/PPV ORAL/NASAL AIRWAY
CONSIDER RE-WARMING HEATED HUMIDIFIED O_2
CONTACT MEDICAL DIRECTION
INTUBATE AND VENTILATE WITH "PEEP"
TRANSPORT
CARDIAC MONITOR
WARMED IV NS TKO
TREAT ARRHYTHMIAS
REMEMBER: PT MAY NOT RESPOND TO TREATMENT UNTIL WARMED

EMT

A. Open and manage the airway and provide oxygen by nasal cannula 4 l/minute and increase as needed for respiratory distress. Apply pulse oximeter and treat per procedure. Be prepared to provide CPR and defibrillation.

B. Make patient comfortable and provide reassurance.

C. Evaluate patient's general appearance, relevant history of current condition and determine:

Onset of the event
Provocation or palliation
Quality of the pain
Region and radiation
Severity
Time

Signs and symptoms
Allergies
Medications
Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Last oral intake
Events leading to present illness

D. Assess the patient to determine if pain is cardiac in origin. For patients with pain of cardiac origin with one or more of the following, fibrinolysis may be contraindicated and medical direction should be contacted:

- Systolic BP > 180-200 mm Hg or diastolic BP > 100-110 mm Hg
- Right versus left arm with a systolic BP difference > 15 mmHg
- History of structural central nervous system disease
- Significant closed head and/or facial trauma within the previous 3 weeks
- Stroke within > 3 hours or < 3 months
- Recent (within 2-4 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal and/or genitourinary bleed
- Any history of intracranial hemorrhage
- Bleeding, clotting problem, or blood thinners
- Pregnant female
- Serious systemic disease (e.g. advanced cancer, severe liver or kidney disease)

Additional criteria which classify a patient as high risk and considered for transfer to a PCI facility are:

- Heart rate ≥ 100 beats per minute and systolic BP < 100 mg Hg
- Pulmonary edema (rales)
- Signs of shock (cool, clammy)
- Contraindications to fibrinolytic therapy
- Required CPR

THIS ASSESSMENT SHOULD BE DONE DURING TRANSPORT

E. May give 160 to 325 mg of aspirin per EMS stock drug procedure. Note true aspirin allergies as opposed to adverse side effects such as peptic distress.

F. If patient is conscious and alert with previous history of angina pain and is taking nitroglycerin or Nitrostat®, administer 0.4 mg tablet or spray of nitroglycerin sublingually. Assure medication is prescribed for patient, is not out-of-date and contact medical direction. The administration of nitroglycerin is contraindicated in patients who have taken phosphodiesterase inhibitors, e.g., Viagra®.

G. Monitor patient's condition, especially blood pressure. Dosage may be repeated in 5 minutes if pain does not subside, the blood pressure does not drop below 100 systolic, and there is no change in level of consciousness.

H. If patient is experiencing an unusual and/or irregular heart rate or pulse, if available, the AEMT or Paramedic may apply a cardiac monitor run a strip for evaluation by the physician at the emergency department. This should only be done during transport. If a Paramedic of the AEMT becomes unavailable to interpret the cardiac monitor strip for any reason, the EMT must advise the patient that the EMT does not have the ability to interpret the strip; however, the interpretation will be performed by the emergency physician or, when available, the Paramedic or AEMT.

I. Establish communications with medical direction and advise of patient condition. Transport immediately.

J. If 12-lead EKG is applied and medical direction or a Paramedic interprets this data as an acute ST segment myocardial infarction (STEMI), medical direction and/or the appropriate receiving facility should be contacted immediately and the patient should be transported directly to a percutaneous cardiac intervention capability (PCI) center if possible.

AEMT

A. Assist EMT, obtain patient condition and circumstance.

B. Apply monitor and check rhythm.

C. Start heplock/saline lock or normal saline TKO while enroute to hospital.

DO NOT DELAY TRANSPORT

D. If the patient is conscious and alert, administer 0.4 mg tablet or spray of nitroglycerin sublingually after establishment of an IV. Monitor patient's condition. The dose may be repeated in 5 minutes intervals if pain does not subside and SBP is above 90mm Hg.

E. If patient is alert, complaining of severe pain, has a systolic BP is above 90mm Hg, and pain that is not relieved by nitroglycerin, contact medical direction, if required, and request nitrous oxide or morphine sulfate.
   i. Morphine dose: Small frequent titrated IV dose 5 mg every 5 minutes as needed until desired effect is achieved.
   ii. Use caution when morphine is administered to patient with COPD or volume depletion.
   iii. With morphine and nitrous oxide, monitor respiration and blood pressure every five minutes.

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation.

B. With chest pain, even if it clearly cannot be determined to be cardiac in origin, the Paramedic should:

1. Support the airway and provide oxygen.

2. Hypotension with signs of shock and the patient is suspected of being in cardiogenic shock (BP less than 70-90 mm Hg systolic with poor perfusion):

   a. Establish IV saline in large vein. Administer normal saline bolus until systolic BP >90 or signs of poor perfusion resolve. Auscultate for rales, observe patient for SOB, or tachypnea. Slow fluids to TKO if these occur.
   b. Elevate feet
   c. Establish a second IV in a large vein for norepinephrine 0.05–0.5 mcg/kg/minute IV or epinephrine, 0.05–0.3 mcg/kg/minute IV titrated to a heart rate ≥60 and an improved blood pressure and LOC. If norepinephrine and epinephrine are not available, dopamine 2–20 mcg/kg/minute IV can be administered.

**IF IV INFILTRATES OR IV ATTEMPT IS UNSUCCESSFUL,
INFORM ED PERSONNEL AS SOON AS POSSIBLE**

3. Relieve pain
   a. If patient is conscious and alert, administer 0.4 mg tablet or spray of nitroglycerin sublingually after establishment of an IV. Monitor the patient's condition. The dose may be repeated in 5 minutes intervals if the pain does not subside and the SBP is above 90 mm Hg.
   b. If patient is alert, complaining of severe pain, the systolic BP is above 90 mm Hg, and the pain is not relieved by nitroglycerin, contact medical direction, if required, and request morphine sulfate.
      i. Morphine dose: Small frequent titrated IV dose 5 mg every 5 minutes as needed until desired effect is achieved.
      ii. Do not use morphine on COPD or volume depletion.
      ii. With morphine, monitor respiration and blood pressure every five minutes.

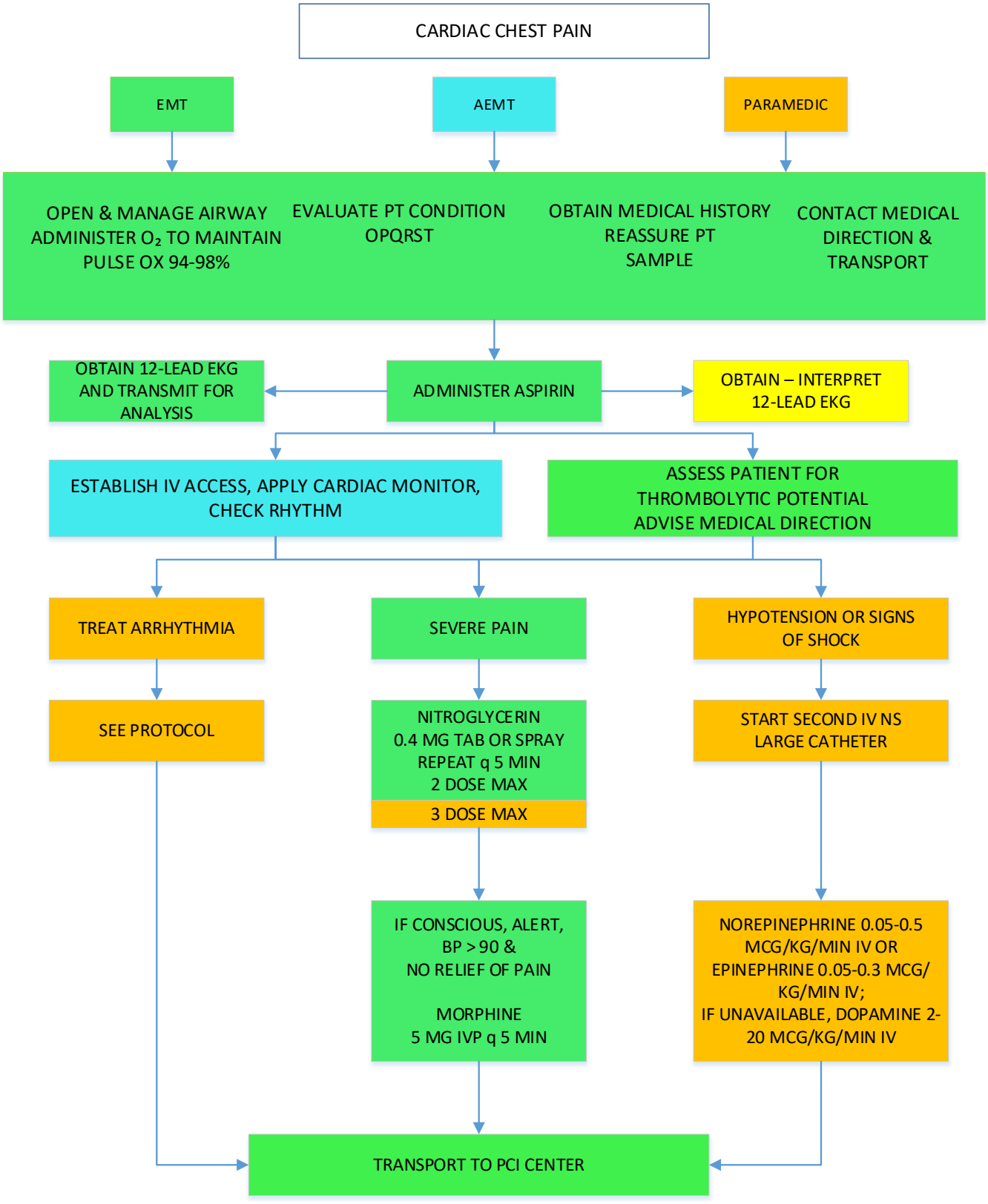
4. Correct cardiac arrhythmias – follow the appropriate arrhythmia guideline

5. Start heplock/saline lock or IV normal saline TKO while enroute to hospital.

DO NOT DELAY TRANSPORT

6. When patient’s pain is suspected to be of cardiac origin, administer aspirin.

**BE SURE TO CHECK FOR A TRUE ASPIRIN ALLERGY
VERSUS PEPTIC DISTRESS WHICH IS AN ADVERSE EFFECT THAT
SHOULD NOT BE A REASON TO WITHHOLD ASPIRIN IN THIS SCENARIO**


CARDIAC CHEST PAIN
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O_2 TO MAINTAIN
PULSE OX 94-98%
EVALUATE PT CONDITION
OPQRST
OBTAIN MEDICAL HISTORY
REASSURE PT
SAMPLE
CONTACT MEDICAL
DIRECTION &
TRANSPORT
OBTAIN 12-LEAD EKG
AND TRANSMIT FOR
ANALYSIS
ADMINISTER ASPIRIN
OBTAIN – INTERPRET
12-LEAD EKG
ESTABLISH IV ACCESS, APPLY CARDIAC MONITOR,
CHECK RHYTHM
ASSESS PATIENT FOR
THROMBOLYTIC POTENTIAL
ADVISE MEDICAL DIRECTION
TREAT ARRHYTHMIA
SEVERE PAIN
HYPOTENSION OR SIGNS
OF SHOCK
SEE PROTOCOL
NITROGLYCERIN
0.4 MG TAB OR SPRAY
REPEAT q 5 MIN
2 DOSE MAX
3 DOSE MAX
START SECOND IV NS
LARGE CATHETER
IF CONSCIOUS, ALERT,
BP > 90 &
NO RELIEF OF PAIN
MORPHINE
5 MG IVP q 5 MIN
NOREPINEPHRINE 0.05-0.5
MCG/KG/MIN IV OR
EPINEPHRINE 0.05-0.3 MCG/
KG/MIN IV;
IF UNAVAILABLE, DOPAMINE 2-
20 MCG/KG/MIN IV
TRANSPORT TO PCI CENTER

GENERAL INSTRUCTIONS

A. Unless delivery is imminent, transport to a hospital with obstetrical capabilities

B. Imminent delivery is when the baby's head is visible in the vaginal opening during a contraction (crowning)

C. A visual inspection of the perineal area should only be done when contractions are less than 5 minutes apart and/or there is bleeding or fluid discharge

D. The EMS professional should not place a gloved hand inside the vagina except in the case of breech delivery with an entrapped head or when a prolapsed umbilical cord is present

E. During delivery, gentle pressure with a flat hand on the baby's head should be applied to prevent an explosive delivery

F. A mother in active labor should be placed on the cot or floor to prevent the newborn from falling after delivery

EMT

A. Obtain the history of patient condition and pregnancy: Contraction duration and interval, due date, number of pregnancies and number of live children, prenatal care, and possible complications.

B. Determine transport or delivery. Transport unless crowning is present during a contraction. Contact medical direction.

C. Always try to transport the mother to the hospital she has designated for delivery.

D. Transport mother on left side with head slightly elevated to relieve pressure on mother's vena cava created by baby. Pressure could cause a decrease in mother's and baby's heart rate.

E. If delivery is imminent, prepare equipment and follow guidelines for delivery. The equipment includes, but is not limited to an OB kit, oxygen and a BVM, towels and blankets, cot, and large dressings

F. After delivery, transport the mother on cot and baby in car seat, if available, or have parent or EMS professional hold the baby during transport as a last resort

G. Keep mother and child warm and monitor their airways and signs of shock

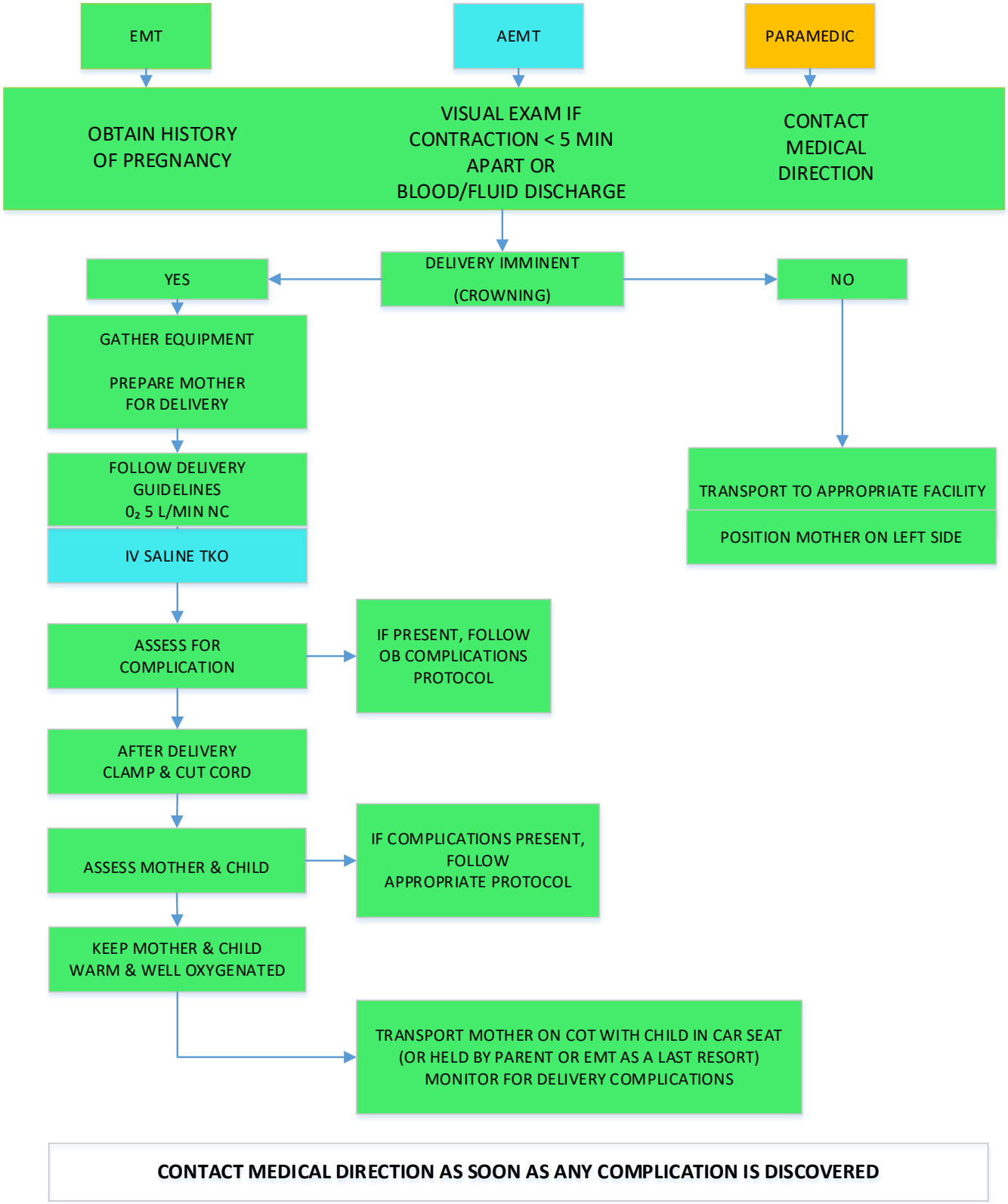
H. Obtain and document the baby’s zero 0-minute and 5-minute APGAR scores

AEMT / PARAMEDIC

A. Assist EMS professional, obtain patient condition and circumstance

B. Start IV saline if hypovolemic shock or excessive bleeding is present

NORMAL DELIVERY



CONTACT MEDICAL DIRECTION AS SOON AS ANY COMPLICATION IS DISCOVERED

EMERGENCY CHILDBIRTH

A. Cord around the baby's neck:

1. As the baby's head passes out the vaginal opening, feel for the umbilical cord. Initially, try to slip the cord over the baby's head. If too tight, clamp cord in two places and cut between clamps.

2. Administer high flow O_2 to the mother.

B. Breech delivery:

1. Footling breech, which is one or both feet delivered first

2. Frank breech, which is the buttocks presenting first
   a. When the feet or buttocks first become visible, there is normally time to transport patient to nearest facility.
   b. If upper thighs or the buttock have come out of the vagina, delivery is imminent.
   c. If the child's body has delivered and the head appears caught in the vagina, the EMS professional must support the child's body and insert two fingers into the vagina along the child's neck until the chin is located. At this point, the fingers should be placed between the chin and the vaginal canal and then advanced past the mouth and nose.
   c. After achieving this position, a passage for air must be created by pushing the vaginal canal away from the child's face. This air passage must be maintained until the child is completely delivered.

C. Excessive bleeding pre-delivery:

1. If bleeding is excessive during this time and delivery is imminent, in addition to normal delivery procedures, the EMS professional should follow the hypovolemic shock guideline.

2. If delivery is not imminent, patient should be transported on her left side and the EMS professional should follow the shock guideline.

D. Excessive bleeding post-delivery:

1. If bleeding appears to be excessive, start an IV of normal saline.

2. If the placenta has been delivered, massage uterus and put the baby to mother's breast.

3. Follow the hypovolemia shock guideline.

E. Prolapsed cord:

1. When the umbilical cord passes through the vagina and is exposed, the EMS professional should check cord for a pulse.

2. The patient should be transported with hips elevated or in the knee chest position with a moist dressing placed around cord.

3. If the umbilical cord is seen or felt in the vagina, insert two fingers to elevate presenting part away from cord, distribute pressure evenly when occiput presents

4. Do <u>not</u> attempt to push the cord back

5. Apply high flow oxygen and transport immediately

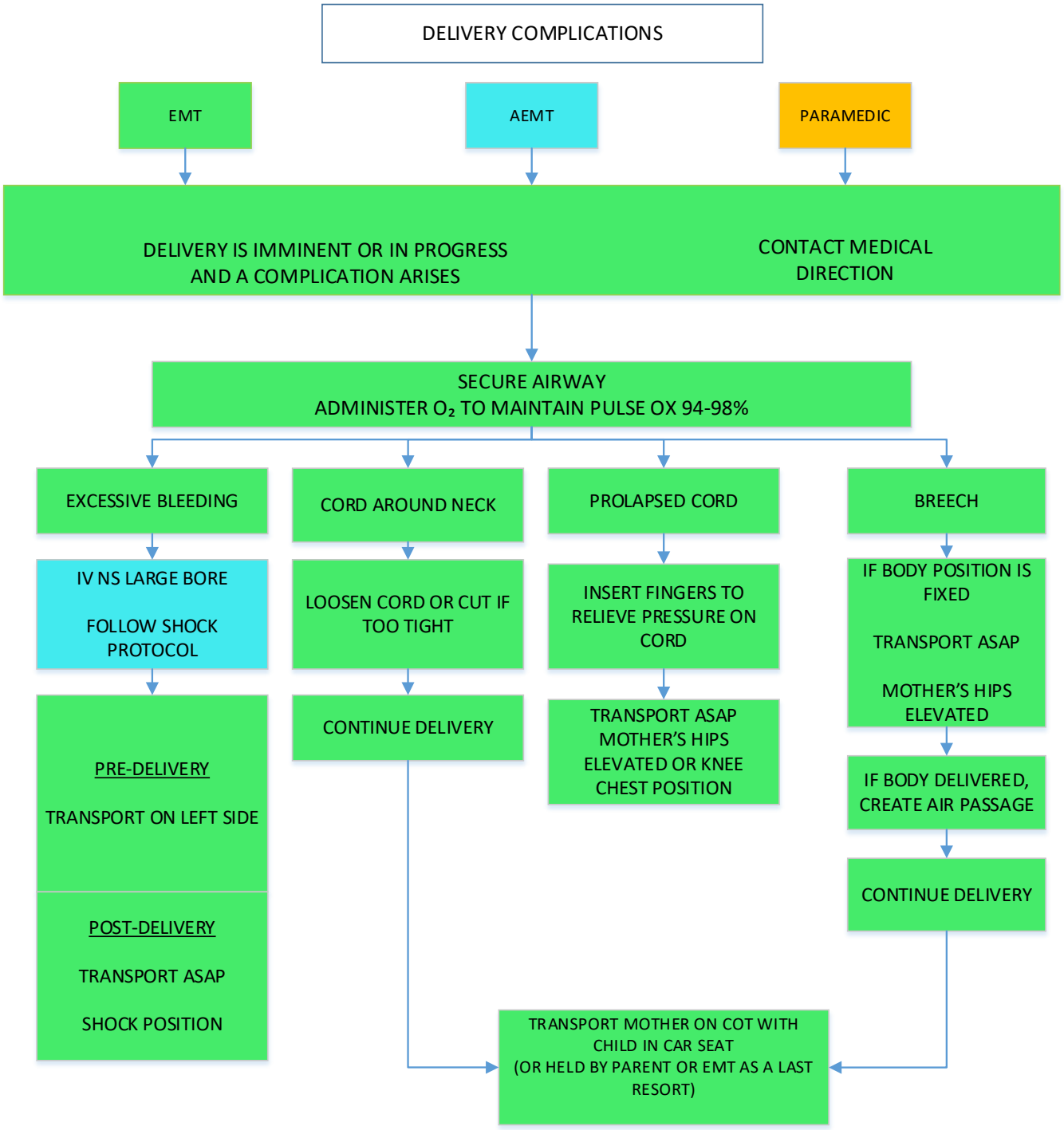
F. Pre-eclampsia and eclampsia

Pre-eclampsia (toxemia) is the presence of any two of the following signs/symptoms after the 20th week of pregnancy

1. Hypertension: Systolic BP ≥ 140 mm Hg or diastolic BP ≥ 90 mm Hg, or a change in the diastolic BP ≥ 15 mm Hg from arterial BP
2. Generalized edema
3. Hyperreflexia
4. Proteinuria

Eclampsia is the presence of toxemia ***plus*** seizures

1. Assure oxygenation and tissue perfusion. Apply oxygen via nasal cannula or 100% O_2 via NRB mask to maintain oxygenation to the mother and fetus
2. Initiate a heplock/saline lock or an IV infusion of normal saline at a TKO rate
3. If the patient is actively seizing upon arrival:
    a. Protect the patient from injury
    b. Initiate a magnesium sulfate infusion of 2 gm IV over 30 minutes
    c. Mix magnesium sulfate 2 gm in 250 ml normal saline and infuse at approximately 8 ml/min
    d. Administer midazolam (Versed®) 2-5 mg slow IV push. The dose may be repeated in five minutes if there is no hypotension and seizures persist
    e. If no IV access obtained, Versed® may be administered via mucosal atomizer device (MAD)
    f. The total dose for Versed® administration should not exceed 10 mg
    g. Watch for signs and symptoms of respiratory depression and treat accordingly
4. All patients with pre-eclampsia (toxemia) or eclampsia should be transported to the hospital


DELIVERY COMPLICATIONS
EMT
AEMT
PARAMEDIC
DELIVERY IS IMMINENT OR IN PROGRESS AND A COMPLICATION ARISES
CONTACT MEDICAL DIRECTION
SECURE AIRWAY
ADMINISTER O_2 TO MAINTAIN PULSE OX 94-98%
EXCESSIVE BLEEDING
CORD AROUND NECK
PROLAPSED CORD
BREECH
IV NS LARGE BORE
FOLLOW SHOCK PROTOCOL
LOOSEN CORD OR CUT IF TOO TIGHT
INSERT FINGERS TO RELIEVE PRESSURE ON CORD
IF BODY POSITION IS FIXED
TRANSPORT ASAP
MOTHER'S HIPS ELEVATED
PRE-DELIVERY
TRANSPORT ON LEFT SIDE
CONTINUE DELIVERY
TRANSPORT ASAP
MOTHER'S HIPS ELEVATED OR KNEE CHEST POSITION
IF BODY DELIVERED, CREATE AIR PASSAGE
POST-DELIVERY
TRANSPORT ASAP
SHOCK POSITION
CONTINUE DELIVERY
TRANSPORT MOTHER ON COT WITH CHILD IN CAR SEAT
(OR HELD BY PARENT OR EMT AS A LAST RESORT)

A. Miscarriage: Premature termination of a pregnancy

1. Assess for shock and treat per the shock guideline

2. Give psychological support to patient and/or family

3. Be sure to take all expelled tissue with you to the hospital

B. Ectopic pregnancy: When growth and development of a fertilized egg occurs outside the uterus

1. Patient may experience severe abdominal pain.

2. May have intra-abdominal and/or vaginal bleeding and discharge.

3. Patient may not know she is pregnant

4. Treat for hypovolemic shock

5. Transport supine with knees flexed

6. Take any expelled tissue with you to the hospital

C. Cardiac arrest: Cardiac resuscitation of the expectant mother is unique due to the changes in the maternal cardiovascular and respiratory physiology

1. Precipitating events for cardiac arrest include pulmonary embolism, trauma, hemorrhage, or congenital or acquired cardiac disease.

2. Standard cardiac resuscitation guideline should be carried out.

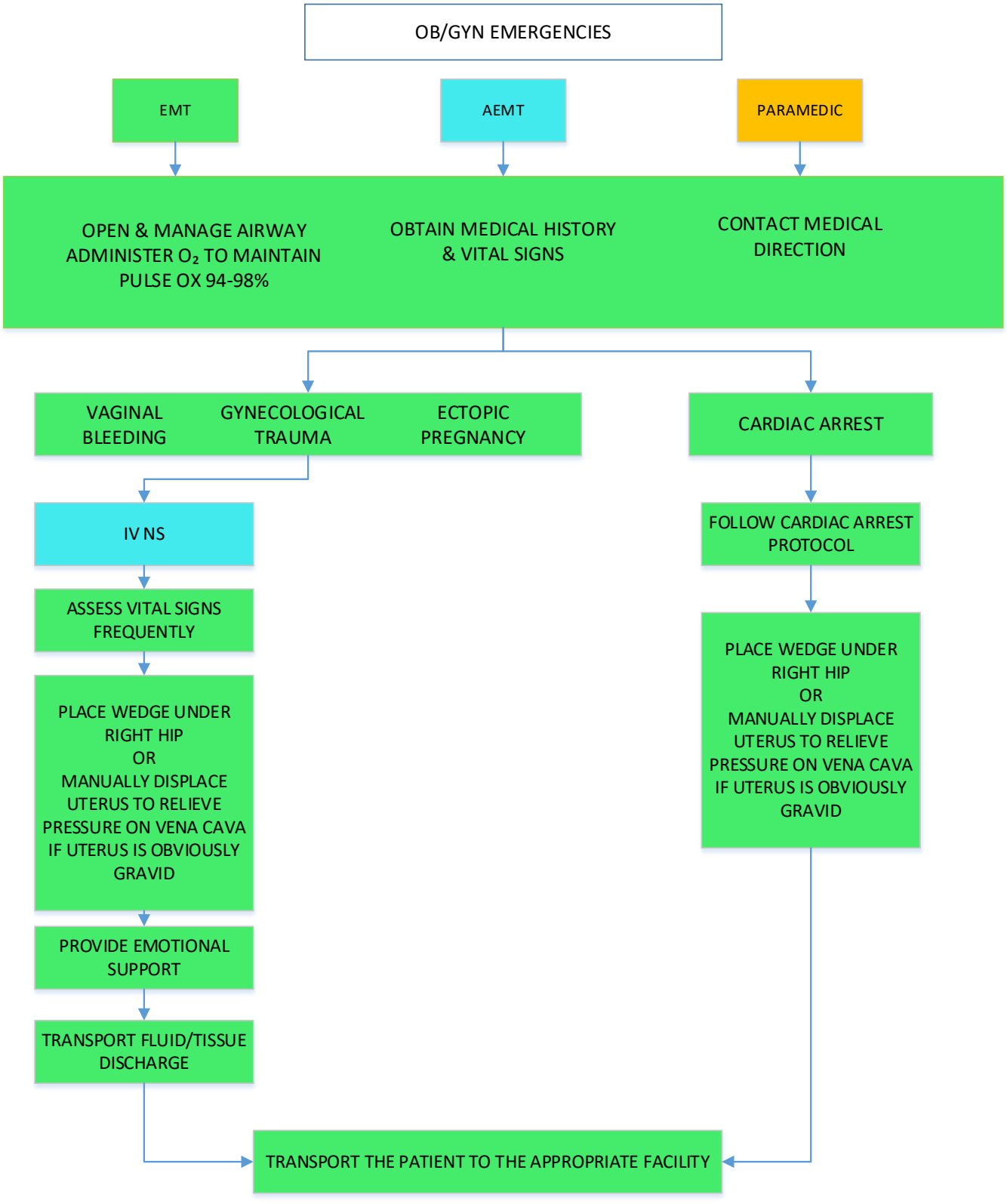
3. When the mother is supine, the fetus may compress the iliac vessels, the inferior vena cava, and the abdominal aorta. To minimize effects of the fetus pressure on venous return:
   a. Place a wedge (pillow) under the right abdominal flank and hip *and/or*
   b. Apply continuous manual displacement of the uterus to the left

D. Third Trimester Bleeding.

1. Abruptio placenta - premature separation of placenta from uterine wall and is characterized by abdominal pain and vaginal bleeding
   a. Blood may be dark in color
   b. Uterus tender

2. Placenta previa - placenta partially or completely covers the cervical (birth) canal and is characterized by painless vaginal bleeding
   a. Blood may be bright red
   b. Uterus may be non-tender

3. Never do an internal or invasive vaginal exam except in a breech presentation or prolapsed cord In patients in active labor (see emergency childbirth guideline)


OB/GYN EMERGENCIES
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O_2 TO MAINTAIN
PULSE OX 94-98%
OBTAIN MEDICAL HISTORY
& VITAL SIGNS
CONTACT MEDICAL
DIRECTION
VAGINAL
BLEEDING
GYNECOLOGICAL
TRAUMA
ECTOPIC
PREGNANCY
CARDIAC ARREST
IV NS
ASSESS VITAL SIGNS
FREQUENTLY
PLACE WEDGE UNDER
RIGHT HIP
OR
MANUALLY DISPLACE
UTERUS TO RELIEVE
PRESSURE ON VENA CAVA
IF UTERUS IS OBVIOUSLY
GRAVID
PROVIDE EMOTIONAL
SUPPORT
TRANSPORT FLUID/TISSUE
DISCHARGE
FOLLOW CARDIAC ARREST
PROTOCOL
PLACE WEDGE UNDER
RIGHT HIP
OR
MANUALLY DISPLACE
UTERUS TO RELIEVE
PRESSURE ON VENA CAVA
IF UTERUS IS OBVIOUSLY
GRAVID
TRANSPORT THE PATIENT TO THE APPROPRIATE FACILITY

EMT

A. Secure and maintain airway. Support with 100% O_2 by NRB mask.

B. Obtain relevant medical history: OPQRST

1. Has patient eaten today?
2. Has patient taken insulin?
3. Onset
4. Medication - Type and time taken

C. Determine blood sugar level

1. If blood sugar is less than 60 mg/dL, administer oral glucose to conscious and alert patients only

2. If unable to obtain blood sugar or if the blood sugar is normal or elevated in an asymptomatic patient, transport and contact medical direction for guidance

D. Establish communications with medical direction and advise of patient condition. Consider transport time if <5 minutes.

AEMT

A. Assist EMS professional, obtain patient condition and circumstance

B. Apply monitor and check rhythm

C. Start heplock/saline lock or IV normal saline TKO while enroute to hospital.

D. Determine blood sugar level

1. If blood sugar is less than 60 mg/dL, administer D50 50 mL IV push (or D25 100 mL or D10 250 mL IV push) immediately or glucagon 1 mg IM. Repeat the dose if the blood sugar remains < 60 mg/mL.

2. If blood sugar is greater than 250 mg/Ll and dehydration, hypotension, vomiting, abdominal pain, or altered mental status is present, infuse patient with a normal saline 20 mL/kg IV bolus at 1000 mL/hr. If hypoperfusion persists, administer additional normal saline IV up to 1 L or until systolic BP is ≥ 90 mm Hg.

3. If unable to obtain blood sugar or if the blood sugar is normal or elevated in an asymptomatic patient, transport and contact medical direction for guidance.

DO NOT DELAY TRANSPORT

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. Apply monitor and check rhythm

C. Start heplock/saline lock or IV normal saline TKO

D. Determine blood sugar level

1. If blood sugar less than 60 mg/dL, administer D50 50 mL IV push (or D25 100 mL or D10 250 mL IV push) immediately or glucagon 1 mg IM. Repeat the dose if the blood sugar remains < 60 mg/dl.

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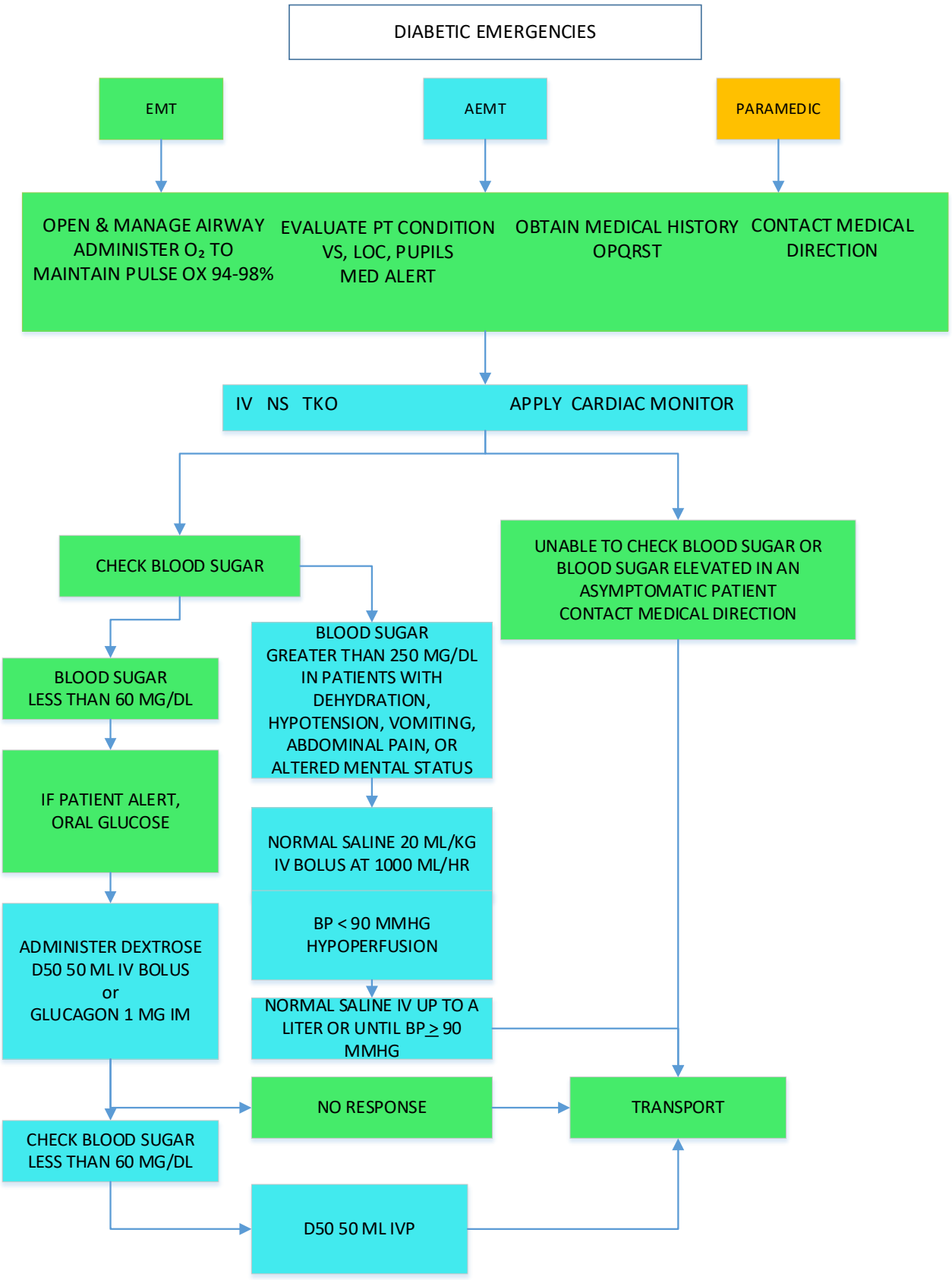

DIABETIC EMERGENCIES
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O_2 TO
MAINTAIN PULSE OX 94-98%
EVALUATE PT CONDITION
VS, LOC, PUPILS
MED ALERT
OBTAIN MEDICAL HISTORY
OPQRST
CONTACT MEDICAL
DIRECTION
IV NS TKO
APPLY CARDIAC MONITOR
CHECK BLOOD SUGAR
UNABLE TO CHECK BLOOD SUGAR OR
BLOOD SUGAR ELEVATED IN AN
ASYMPTOMATIC PATIENT
CONTACT MEDICAL DIRECTION
BLOOD SUGAR
LESS THAN 60 MG/DL
BLOOD SUGAR
GREATER THAN 250 MG/DL
IN PATIENTS WITH
DEHYDRATION,
HYPOTENSION, VOMITING,
ABDOMINAL PAIN, OR
ALTERED MENTAL STATUS
IF PATIENT ALERT,
ORAL GLUCOSE
NORMAL SALINE 20 ML/KG
IV BOLUS AT 1000 ML/HR
BP < 90 MMHG
HYPOPERFUSION
ADMINISTER DEXTROSE
D50 50 ML IV BOLUS
or
GLUCAGON 1 MG IM
NORMAL SALINE IV UP TO A
LITER OR UNTIL BP ≥ 90
MMHG
NO RESPONSE
TRANSPORT
CHECK BLOOD SUGAR
LESS THAN 60 MG/DL
D50 50 ML IVP

GENERAL CONSIDERATIONS

TRAUMA

A. Do not allow eye injury to distract you from the basics of trauma care

B. Do not remove any foreign body imbedded in the eye or orbit. Stabilize any large protruding foreign bodies.

C. With blunt trauma to the eye, if time permits, examine the globe briefly for gross lacerations as the lid may be swollen tightly shut later. Scleral rupture may lie beneath an intact conjunctiva.

1. Do not exert pressure on the globe when doing the exam or when covering for transport

2. A light sterile wet dressing may be used to cover the eye for transport and avoid applying direct pressure to the eye by covering it with a protective shield (e.g. metal patch, drinking cup)

   Do not delay transport by covering the eye if the patient has other life-threatening injuries.

D. Covering both eyes when only one eye is injured may help to minimize trauma to the injured eye; however, in some cases the patient is too anxious to tolerate this

E. Transport the patient sitting in the upright position unless other life threats prohibit this from being done.

CHEMICAL BURNS

A. When possible, determine the type of chemical involved first. The eye should be irrigated with copious amounts of water or saline using IV tubing wide open for a minimum of 15 minutes started as soon as possible. Any delay may result in serious damage to the eye.

B. A topical ophthalmic anesthetic should be placed in the eye prior to irrigation. Always check to determine if the patient has any allergy to anesthetic agents

C. Always obtain name and, if possible, a sample of the contaminant or ask that they be brought to the hospital as soon as possible

CONTACT LENSES

A. If possible, contact lenses should be removed from the eye and transported to the hospital with the patient. If the lenses cannot be removed, notify the ED personnel as soon as possible.

B. If the patient is conscious and alert, it is much safer and easier to have the patient remove their lenses

ACUTE, UNILATERAL VISION LOSS

A. When a patient suddenly loses vision in one eye with no pain, there may be a central retinal artery occlusion. Urgent transport and treatment is necessary.

B. Patient should be transported in flat and supine position.

EMT/AEMT

A. Keep patient calm and lying flat unless otherwise indicated

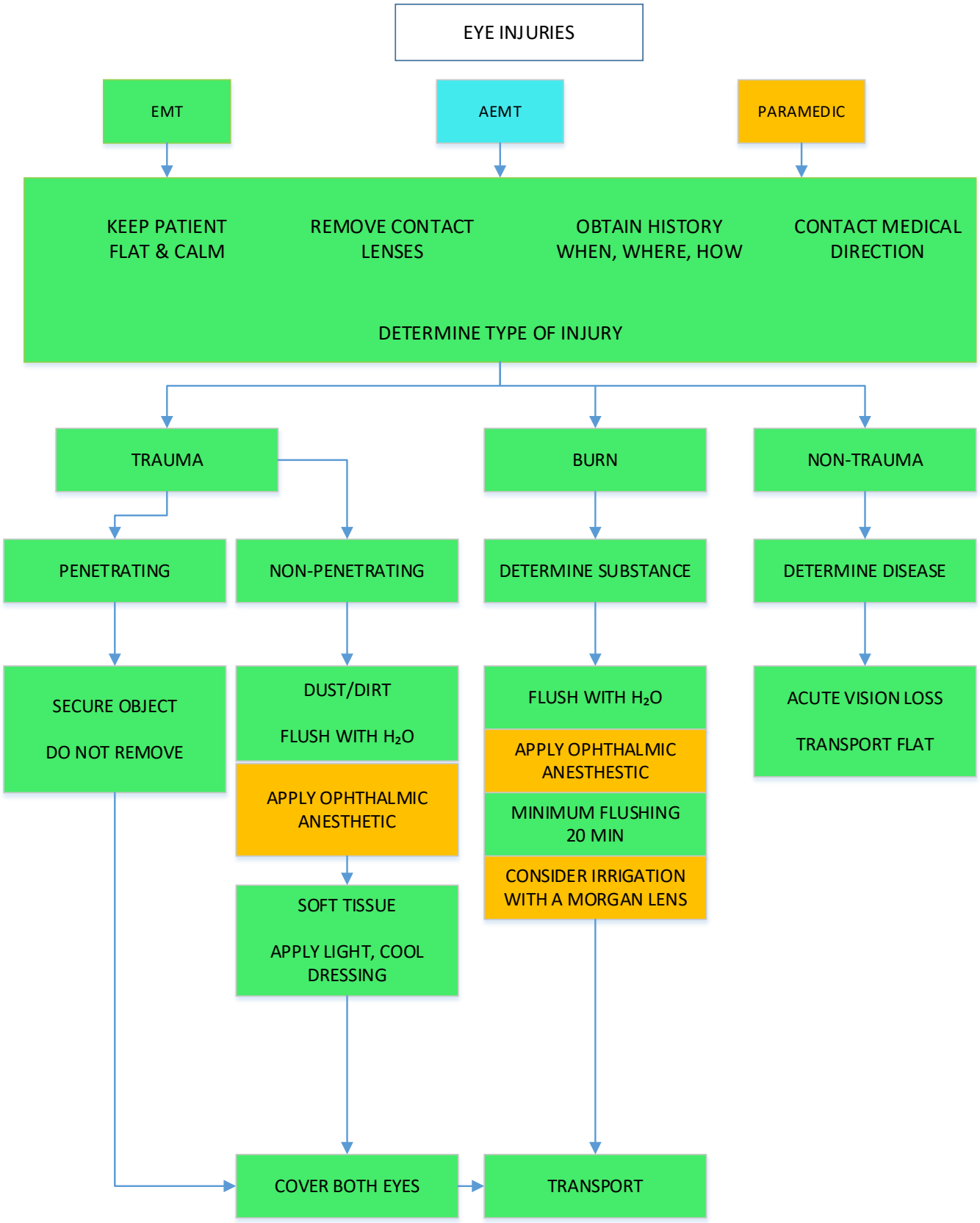
B. Obtain history of injury: type, where, when, how.

C. Establish communications with medical direction and advise of patient condition. Transport immediately, unless an advanced life support unit is enroute and has an ETA of less than 5 minutes.

PARAMEDIC

A. Assume charge of situation and confer with EMS professional about condition of patient and situation.

B. In cases where eyes may need irrigation, administer two (2) drops of topical ophthalmic anesthetic (i.e. tetracaine) in the eyes, if available, and irrigate with copious amounts of water or saline using IV tubing wide open or a Morgan lens


EYE INJURIES
EMT
AEMT
PARAMEDIC
KEEP PATIENT FLAT & CALM
REMOVE CONTACT LENSES
OBTAIN HISTORY WHEN, WHERE, HOW
CONTACT MEDICAL DIRECTION
DETERMINE TYPE OF INJURY
TRAUMA
BURN
NON-TRAUMA
PENETRATING
NON-PENETRATING
DETERMINE SUBSTANCE
DETERMINE DISEASE
SECURE OBJECT
DO NOT REMOVE
DUST/DIRT
FLUSH WITH H_2O
APPLY OPHTHALMIC ANESTHETIC
SOFT TISSUE
APPLY LIGHT, COOL DRESSING
FLUSH WITH H_2O
APPLY OPHTHALMIC ANESTHESTIC
MINIMUM FLUSHING 20 MIN
CONSIDER IRRIGATION WITH A MORGAN LENS
ACUTE VISION LOSS
TRANSPORT FLAT
COVER BOTH EYES
TRANSPORT

GENERAL CONSIDERATIONS

A. This guideline was written to assist those instances of hypothermic injury involving long evacuation and transport time. When possible, all treatment should be performed in the hospital setting although any associated illnesses or injuries should be addressed.

B. Generalized Hypothermia:

1. The most common mechanism of death in hypothermia is ventricular fibrillation (VF). If the hypothermia victim is in ventricular fibrillation, CPR should be initiated. If VF is not present, then all treatment and transport decisions should be tempered by the fact that VF can be induced by rough handling, noxious stimuli, or even minor mechanical disturbances. This means that respiratory support with 100% oxygen should be done gently, including intubation. Hyperventilation can decrease the threshold for VF. Ventilation should be performed with the goal of achieving a normal end tidal CO_2 or at half the normal rate if end tidal CO_2 monitoring is not available

2. In the absence of monitor-confirmed VF, the decision to initiate CPR must consider the following:

   a. Hypothermia may produce profound bradycardia and the pulse should be taken for at least 60 seconds before concluding that the patient is pulseless.
   b. Hypothermia can exert a protective effect on body tissues. The hypothermia victim's own cardiac activity, even when profoundly bradycardic, may be preferred to CPR-generated perfusion, especially in light of the fact that CPR may well precipitate VF.

3. The heart is most likely to fibrillate between 85-88° F. (29°-31° C.) Defibrillate VF / VT up to a total of three shocks (200 J, 300 J, 360 J) or at the energy level recommended by the manufacturer. The patient's cardiovascular system may not respond to defibrillation or resuscitative medications until the core temperature is ≥ 30° C at which time the normal frequency of defibrillation should be performed.

4. Since fibrillation is so difficult to convert without rewarming, measures to rewarm should be instituted in any hypothermia victim with VF. The decision to rewarm should be made in consultation with medical direction and should consider the following factors:

   a. Method of rewarming available
   b. Transport time and distance from the hospital
   c. Squad capability and resources for the treatment of VF (ALS or BLS)

5. Shivering stops below 90° F. (32° C).

6. Consider hypoglycemia in the hypothermic patient.

7. Wet clothing robs heat from the body more than it insulates and, therefore, should be removed while protecting victim from the wind and other environmental elements.

8. Never give hot liquids by mouth.

9. Generalized hypothermia can occur whenever the ambient temperature is less than body temperature and the body is not capable of maintaining that temperature. For example, an elderly debilitated patient sitting overnight in a room which is at 66° F. may become hypothermic from that exposure alone. Suspect hypothermia in the injured, elderly, or debilitated patient in less than frigid ambient temperatures.

10. Patients thought to have arrested from hypothermia may benefit from resuscitation even after prolonged downtime. Patients should not be concerned dead until rewarming has been attempted. If evidence that the patient suffered cardiac arrest and then become hypothermic afterwards due to prolonged down time between cardiac arrest and being found, there is no rationale to initiate resuscitation.

11. CPR should not be initiated if any of the following conditions exist:

    a. Obvious fatal injuries (e.g., decapitation)
    b. Patient exhibits signs of being frozen (e.g., ice formation in the airway)
    c. Chest wall rigidity such that the delivery of chest compressions is impossible
    d. Danger to the rescuers or rescuer exhaustion
    e. Avalanche victim buried for 35 minutes or longer with airway obstruction by ice or snow

12. Transport hypothermic patients in cardiac arrest to a facility capable of performing extracorporeal membrane oxygenation (ECMO) or cardiopulmonary bypass if available.

C. Local Hypothermia (frostbite):

1. Thawing should be done under controlled conditions. It is extremely painful.

2. Complete rewarming requires active heating for prolonged period. Warming should not be initiated unless it can be maintained for extrication and transport. If rewarming is feasible and refreezing can be prevented, use of circulating warm water, at 37°C to 39°C, is preferred. If warm water not available, the frostbitten area can be placed on a non-affected part of the patient's body to warm. The frostbitten area should not be massaged or scrubbed since this can cause tissue damage.

EMT

A. Secure airway and consider cervical spine injury

1. Administer warmed 100% oxygen, if available, by NRB mask and or BVM.

B. Move the patient to warm environment, remove any wet clothing, and cover with blankets.

C. Evaluate the patient's general appearance, relevant history of condition, and determine:

Onset of the event
Provocation or palliation
Quality of the pain
Region and radiation
Severity
Time

Signs and symptoms
Allergies
Medications
Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Last oral intake
Events leading to present illness

D. Assess vital signs, mental status, temperature of patient and environment, and evidence of local injury.

E. Generalized hypothermia with arrest

1. Begin CPR and transport unless AED or ALS is available in less than 5 minutes.

2. If an automated external defibrillator (AED) is available:

    a. Assess patient for respiratory and cardiac arrest.

b. Apply AED and activate device. Verbal and written documentation should include:

- EMS delivering care, unit number and ID of EMT
- Initial call information (i.e. man down, drowning, etc.)
- Initial patient assessment, findings and impression
- Care given to this point
- Ongoing outcomes of care delivered to patient

i. "No shock advised"

(a) Provide quality CPR as recommended by the American Heart Association.

(b) Establish communications with medical direction and advise of cardiac arrest.

(c) Transport immediately unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.)

ii. "Shock advised"

(a) Defibrillate at 120 J-200 J biphasic or 360 J monophasic or at the energy level recommended by the manufacturer

(b) Provide quality CPR for two minutes

(c) Analyze rhythm and defibrillate again if shock advised

F. Generalized hypothermia without arrest

1. Do <u>not</u> initiate CPR if there is any pulse present, regardless of the severity of bradycardia.

2. Use oxygen, high flow. Do not hyperventilate. Do not use adjunctive airway equipment unless absolutely necessary. If necessary, use least intrusive measures which will adequately assure airway and ventilation.

3. Avoid rough handling and unnecessary stimulation.

4. If rewarming is undertaken, rewarm rapidly by applying warm packs or hot water bottles to trunk, neck, and groin only.

5. Do not allow conscious patients to ambulate, exercise, or move about.

G. Local hypothermia (frostbite):

1. Protect the injured areas from pressure, trauma, or friction. Remove all covering from injured parts. Do not rub. Do not break blisters.

2. Do not thaw injured part with local heat in excess of 100-110° F. (water that is comfortably hot to the touch without burning).

3. Do not allow limb to thaw if there is a chance that limb may refreeze before evacuation is complete.

4. Maintain core temperature by keeping patient warm with blankets, warm fluids, etc.

5. Transport and contact medical direction of situation

AEMT

A. Confer with EMS professionals and confirm assessment.

B. During transport:

1. Apply cardiac monitor, check rhythm, and treat according to the appropriate cardiac and/or arrhythmia guideline.

2. Provide quality CPR if pulseless and defibrillate per the cardiac arrest guideline.

3. Intubation, oxygenate with 100% O_2, warm/humidified if available.

4. Administer IV NS, warmed if available. If hypotensive, administer 200-300 mL NS IV push. Contact medical direction.

5. Evaluate blood sugar for possible need for dextrose administration.

PARAMEDIC

A. Confer with EMS professionals and confirm assessment.

B. During transport:

1. Apply cardiac monitor, check rhythm and treat according to the appropriate cardiac and/or arrhythmia guideline.

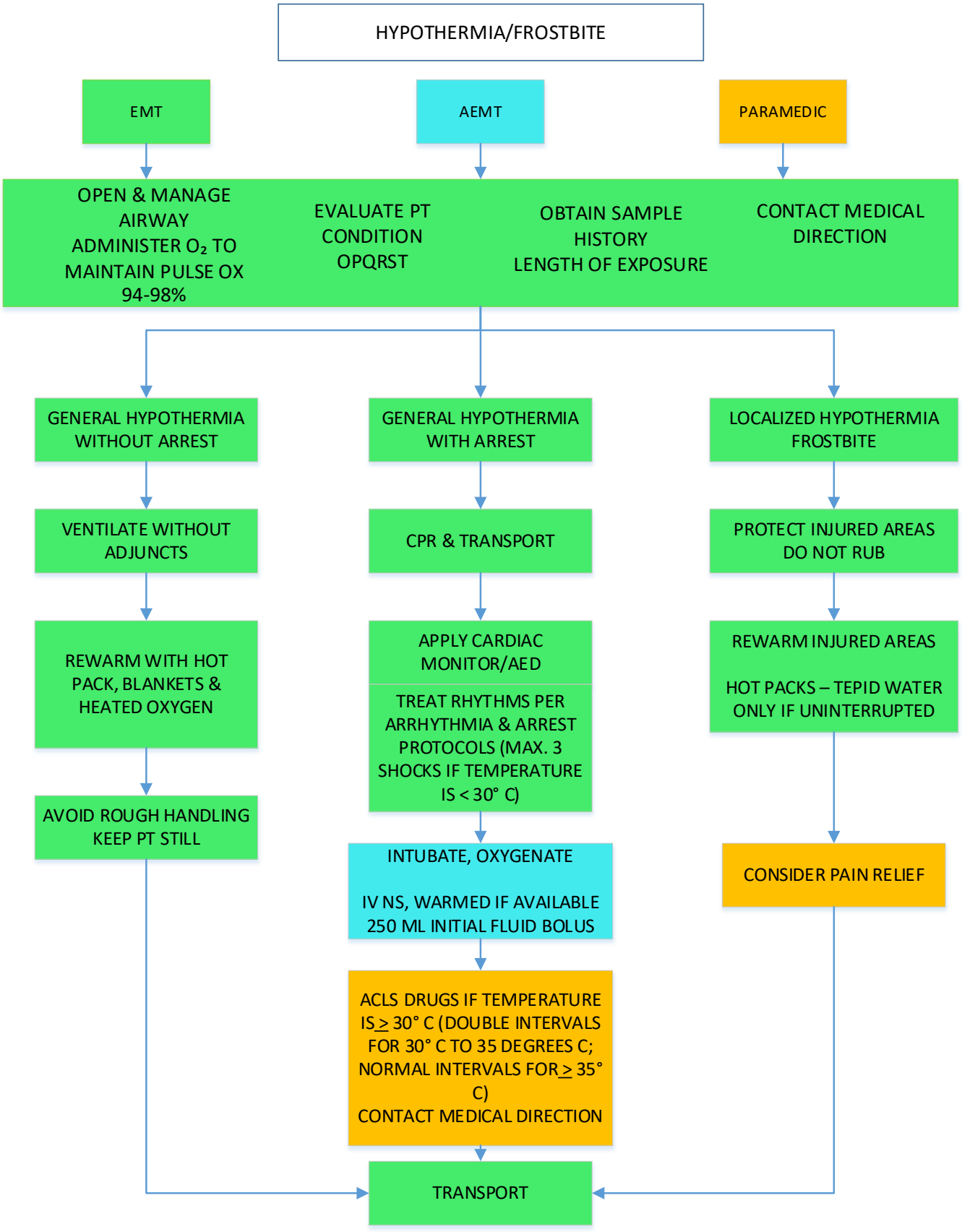
2. Intubation, oxygenate with 100% O_2, warm/humidified if available.

3. Administer IV NS, warmed if available. If hypotensive, administer 200-300 NS IV push.

4. Evaluate blood sugar for possible need for dextrose administration.

5. ACLS medications will be ineffective if the patient's temperature is <30° C and should be withheld. Administer ACLS medications at double the normal intervals when the patient's temperature is ≥ 30° C. Administer ACLS medications at the normal intervals when the patient's temperature is ≥ 35° C.

6. When rewarming patients, consider analgesics for pain relief.


HYPOTHERMIA/FROSTBITE
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY
ADMINISTER O_2 TO MAINTAIN PULSE OX 94-98%
EVALUATE PT CONDITION
OPQRST
OBTAIN SAMPLE HISTORY
LENGTH OF EXPOSURE
CONTACT MEDICAL DIRECTION
GENERAL HYPOTHERMIA WITHOUT ARREST
GENERAL HYPOTHERMIA WITH ARREST
LOCALIZED HYPOTHERMIA FROSTBITE
VENTILATE WITHOUT ADJUNCTS
CPR & TRANSPORT
PROTECT INJURED AREAS DO NOT RUB
REWARM WITH HOT PACK, BLANKETS & HEATED OXYGEN
APPLY CARDIAC MONITOR/AED
TREAT RHYTHMS PER ARRHYTHMIA & ARREST PROTOCOLS (MAX. 3 SHOCKS IF TEMPERATURE IS < 30° C)
REWARM INJURED AREAS
HOT PACKS – TEPID WATER ONLY IF UNINTERRUPTED
AVOID ROUGH HANDLING KEEP PT STILL
INTUBATE, OXYGENATE
IV NS, WARMED IF AVAILABLE 250 ML INITIAL FLUID BOLUS
CONSIDER PAIN RELIEF
ACLS DRUGS IF TEMPERATURE IS ≥ 30° C (DOUBLE INTERVALS FOR 30° C TO 35 DEGREES C; NORMAL INTERVALS FOR ≥ 35° C)
CONTACT MEDICAL DIRECTION
TRANSPORT

GENERAL CONSIDERATIONS

A. Recognize that the very old, very young, and patients with a history of spinal injury are at a higher risk of sustaining a heat-related illness.

B. Heat exposure can occur either due to increased environmental temperatures, prolonged exercise, or a combination of both. Environments with temperature above 90°F and humidity over 60% present the most risk.

C. Hyperthermia can be caused by medical conditions such as fever with delirium, thyroid storm, delirium tremens, neuroleptic malignant syndrome, malignant hyperthermia, sympathomimetic toxicity, and serotonin syndrome. Other causes or contributory factures include heart medications, diuretics, cold medications, prescription and over-the-counter herbal supplements, drugs of abuse, and/or psychiatric medications.

D. Types of heat-related illness:

1. Heat stroke: The most serious type of exposure illness and is usually due to prolonged exposure to heat, inadequate fluid replacement, and deficient thermoregulatory function. The patient will often experience inadequate perspiration with body temperatures reaching 40.5°C (105°F) or greater. The skin is usually hot and dry and the patient will have an altered LOC and/or coma. Seizures may also occur. Cardiovascular collapse is the usual cause of death.

2. Heat exhaustion: A more moderate form of heat exposure associated with dehydration combined with overexertion. The skin is cooler and the core temperature is below 40°C (105°F). The patient will not have an altered LOC or coma, but may experience syncope with orthostatic hypotension.

3. Heat cramps: The mildest form of heat exposure caused by dehydration, overexertion, and electrolyte abnormalities. The skin is moist with muscle cramps usually affecting large muscle groups.

C. When altered mental status is present, also consider and assess for other causes such as hypoglycemia, hypoxia, trauma, stroke, and/or shock.

EMT

A. Secure airway, and consider cervical spine injury.

1. Administer oxygen, maintaining a 94-98% SpO_2 or BVM.

B. Move patient to cool environment, remove any tight clothing.

C. Evaluate patient's general appearance, relevant history of condition and determine:

Onset of the event
Provocation or palliation
Quality of the pain
Region and radiation
Severity
Time

Signs and symptoms
Allergies
Medications
Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Last oral intake
Events leading to present illness

D. Assess vital signs, mental status, temperature of patient and environment every 15 minutes.

HEAT EXPOSURE (continued)

E. Determine type of exposure and initiate treatment:

1. Heat stroke: Rapid cooling on scene should be prioritized to transport. If unable to cool the patient on scene, initiate transport and notify the receiving facility of the need for rapid cooling to give them time to prepare.

   a. Ice bath immersion provides the most rapid means of cooling
   b. If ice bath immersion is not available, consider:
      i. Tarp-assisted cooling with oscillation
      ii. Rotating ice water-soaked towels or sheets
      iii. Continually misting the exposed skin with tepid water while fanning the victim

2. Heat exhaustion

   a. Provide oral fluids if there is no nausea and/or vomiting
   b. Apply cold packs to the axilla, groin, and neck (avoid shivering)

3. Heat cramps

   a. Provide oral fluids and electrolyte beverages if there is no nausea and/or vomiting.

AEMT

A. Confer with EMS professionals and confirm assessment.

B. During transport:

1. Apply cardiac monitor, check rhythm, and treat according to the appropriate cardiac and/or arrhythmia guideline.

2. If hypoperfusion is present, initiate a normal saline 250 mL IV bolus and contact medical direction.

PARAMEDIC

A. Confer with EMS professionals and confirm assessment.

B. During transport:

1. Apply cardiac monitor, check rhythm and treat according to the appropriate cardiac and/or arrhythmia guideline.

2. Intubation, oxygenate with 100% O_2, if indicated.

3. If hypoperfusion is present, initiate a normal saline IV bolus. Contact medical direction.

4. Treat seizures per the seizure guideline.

5. Consider benzodiazepine administration if shivering occurs during cooling or is preventing effective cooling.

GENERAL CONSIDERATIONS

A. The practice of prehospital emergency medicine requires expertise in a wide variety of pharmacological and non-pharmacological techniques to treat acute pain resulting from myriad injuries and illnesses. Approaches to pain relief must be designed to be safe and effective in the dynamic prehospital environment. The degree of pain and the hemodynamic status of the patient will determine the urgency and extent of analgesic interventions.

B. A discussion with the patient regarding realistic expectations for pain control is an element within the process of pain management that is frequently overlooked. Multiple factors that include, but are not limited to, type and severity of illness or injury, individual pain tolerance, extrication processes, and transport times are variables that may impact levels of pain as well as pain management. Dependent upon the patient condition, scenario, and patient's pain tolerance, the goal of pain management may be pain control or reduction of discomfort rather than complete elimination of pain.

C. This guideline does not address pain management for the following patient presentations:

1. Pregnancy with active labor
2. Dental pain
3. Patients with care plans that prohibit the use of parenteral analgesics by EMS
4. Patients with chronic pain who are not enrolled in a hospice or palliative care plan

For these patients, consultation with medical direction is recommended.

D. Assessment of the patient's vital signs and level of pain, preferably using a pain scale, should be performed before and after each therapeutic intervention

E. Airway management adjuncts required to treat respiratory depression and naloxone (Narcan®) should be readily available for potential administration when opioids are administered

F. Opioid administration requires caution in patients with a GCS <15, hypoxia, or hypotension

G. Opioid administration is contraindicated in patients who have used MAO inhibitors within 14 days

EMT

A. Determine the patient's onset and level of pain. A self-reported numeric scale is usually applicable to the adult population; however, variable levels of pain tolerance makes this measurement subjective.

B. Utilize verbal reassurance to control anxiety

C. If available, consider use of non-pharmaceutical pain management techniques
1. Placement of the patient in a position of comfort
2. Application of ice packs and/or splints for pain secondary to trauma

AEMT

A. Apply a cardiac monitor if indicated based upon patient assessment

B. If the patient is experiencing moderate discomfort or if patient positioning and/or the application of ice packs and/or splints provides inadequate pain control, consider the administration of analgesics.

1. Acetaminophen (Tylenol®) 15 mg/kg PO (maximum dose of 1 gm)
2. Ibuprofen (Motrin, Advil®) 10 mg/kg PO (maximum dose of 800 mg)
3. Ketorolac (Toradol®) – one-time dose only
   a. Adults who are not pregnant or possibly pregnant: 30 mg IM
   b. Geriatric patients: 1 mg/kg IM (maximum dose of 30 mg)

4. Ketamine 0.25 mg/kg IN (maximum initial dose of 25 mg, maximum cumulative dose of 100 mg)
5. Nitrous oxide – Must be self-administered (See medication appendix for administration guidelines)
6. Morphine sulfate 0.1 mg/kg IM (maximum dose of 10 mg IM)
7. Fentanyl 1 mcg/kg IN or IM (maximum initial dose of 100 mcg)

C. If the patient is experiencing severe to excruciating pain or if the treatment provided to control moderate pain is ineffective or clinically inadequate, consider the administration of parenteral analgesics. Establish an IV of normal saline or a saline lock based upon patient assessment

1. Ketorolac (Toradol®) – one-time dose only
   a. Adults who are not pregnant or are possibly pregnant: 15 mg IV
   b. Consider a reduced dose in geriatric patients
2. Ketamine 0.25 mg/kg IM, IV, or IO (maximum initial dose of 25 mg, maximum cumulative dose of 100 mg)
3. Morphine sulfate 0.1 mg/kg IV or IO (maximum initial dose of 10 mg)
4. Fentanyl 1 mcg/kg IV or IO (maximum initial dose of 100 mcg)
5. Hydromorphone (Dilaudid®) 0.015 mg/kg IM, IV, or IO (maximum initial dose of 2 mg, maximum cumulative dose of 4 mg)

D. The administration of oral ondansetron (Zofran®) may be indicated to prevent nausea and vomiting from analgesics and/or pain

E. If indicated based on pain assessment and as vital signs allow, repeat pain medication administration (excluding ketorolac) after 5 minutes of the previous dose and monitor the patient's end tidal CO_2

PARAMEDIC

A. If ketorolac was previously administered IM, a second dose should not be administered IM or IV

B. The administration of oral or intravenous antiemetics, e.g., ondansetron (Zofran®), may be indicated to prevent nausea and vomiting from analgesics and/or pain

C. If indicated based on pain assessment and as vital signs allow, repeat pain medication administration (excluding ketorolac) after 5 minutes of the previous dose and monitor the patient's end tidal CO_2

GENERAL CONSIDERATIONS

EMS professionals should consider the possibility of accidental or self-poisoning under the following conditions:

A. History of observed or admitted accidental or intentional ingestion
B. Coma
C. History of known suicide gesture
D. Suggestive intoxicated behavior (hyperactive, hypoactive, unstable walk, lethargic)

EMT

A. Establish airway

B. Obtain relevant history

1. What, when, why taken (if known)
2. Quantity taken (if known)
3. Victim's age and weight

C. Take whatever container the substance came from to the hospital along with readily obtainable samples of medication unless this results in an unreasonable delay of transport

D. Evaluate the patient's:

1. Breath sounds (rales)
2. Level of consciousness
3. Pupil size
4. Evidence of head injury

E. Depending on route poison entered body apply the following:

1. Ingested Poisons - Transport (contact medical direction for prolonged transports >30 minutes or for recommendation for charcoal administration)

2. Inhaled Poisons

   a. Remove from toxic area
   b. Secure airway, support with 100% oxygen
   c. Assist in ventilation if necessary

3. Absorbed Poisons

   a. Remove victim's clothing
   b. Identify substance
   c. Flush skin with water before and during transport if possible - at least 10-15 minutes
   d. If eyes are involved flush with water or saline for 10-15 minutes

4. Injected Poisons

   a. Secure and maintain airway
   b. Find substance and introduction system, if possible
   c. For snake bites, do not suction the wound or apply constricting bands, tourniquets, or ice

AEMT

A. Assist EMS professionals, obtain patient condition and circumstance

B. Apply monitor and check rhythm

C. Start heplock/saline lock or IV normal saline TKO while enroute to hospital. Do not delay transport.

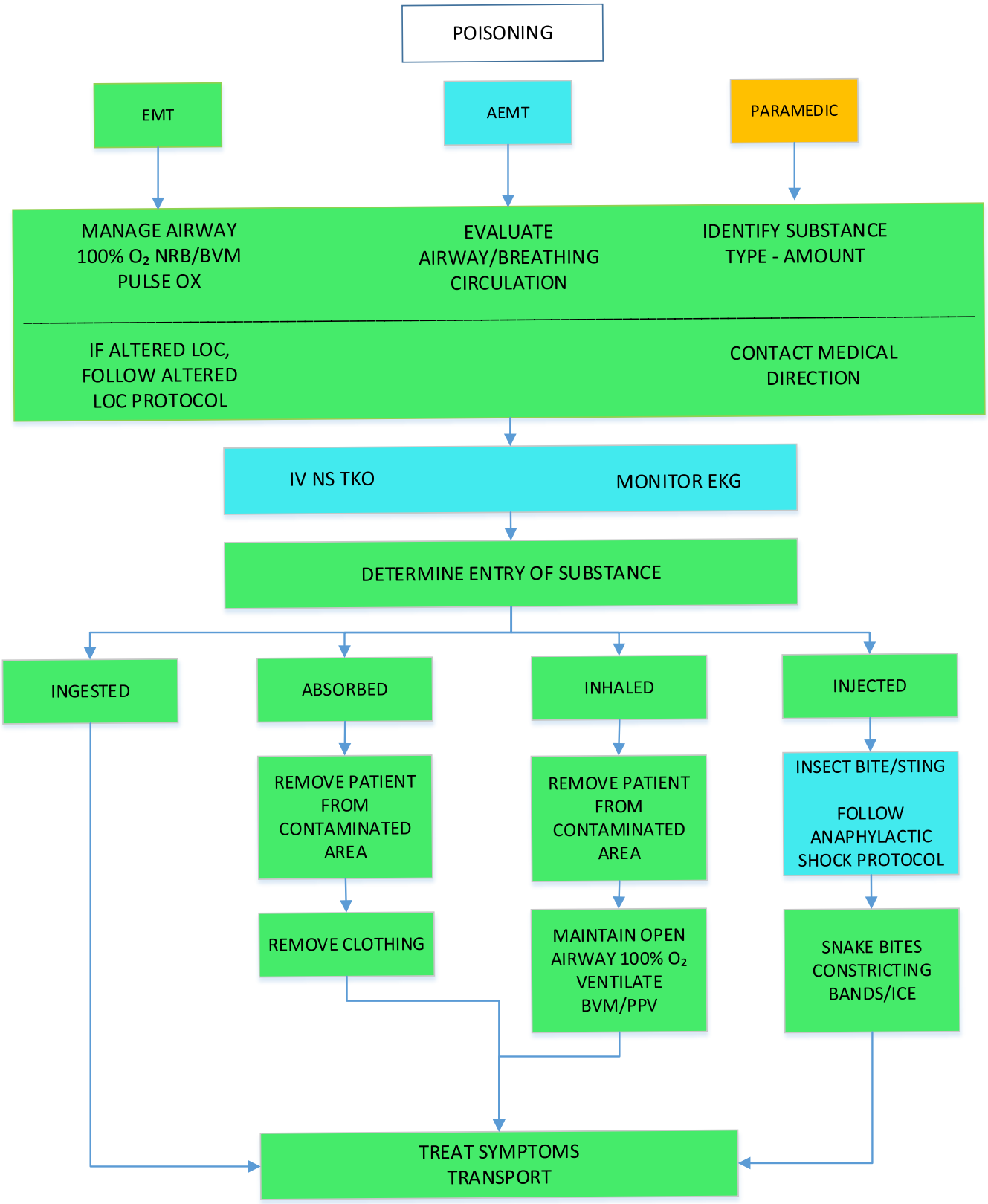
PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. If patient has an altered mental status, follow the altered level of consciousness guideline

C. Start heplock/saline lock or IV normal saline TKO

D. Contact medical direction for prolonged transports anticipated to be greater than 30 minutes for a potential recommendation for charcoal administration.


POISONING
EMT
AEMT
PARAMEDIC
MANAGE AIRWAY
100% O_2 NRB/BVM
PULSE OX
EVALUATE
AIRWAY/BREATHING
CIRCULATION
IDENTIFY SUBSTANCE
TYPE - AMOUNT
IF ALTERED LOC,
FOLLOW ALTERED
LOC PROTOCOL
CONTACT MEDICAL
DIRECTION
IV NS TKO
MONITOR EKG
DETERMINE ENTRY OF SUBSTANCE
INGESTED
ABSORBED
INHALED
INJECTED
REMOVE PATIENT
FROM
CONTAMINATED
AREA
REMOVE PATIENT
FROM
CONTAMINATED
AREA
INSECT BITE/STING
FOLLOW
ANAPHYLACTIC
SHOCK PROTOCOL
REMOVE CLOTHING
MAINTAIN OPEN
AIRWAY 100% O_2
VENTILATE
BVM/PPV
SNAKE BITES
CONSTRICTING
BANDS/ICE
TREAT SYMPTOMS
TRANSPORT

EMT/AEMT/PARAMEDIC

A. Obtain relevant history:

1. Previous psychiatric hospitalization, when, and where
2. Where does the patient receive psychiatric care?
3. What drugs does the patient take (including alcohol)?

B. Calm the patient

C. Evaluate the patient's:

1. Vital signs
2. General appearance
3. Fingerstick blood glucose

D. Contact medical direction and advise of patient condition

E. Transport patients to appropriate facility.

F. Contact local law enforcement for assistance with violent, homicidal, or suicidal patients

NOTE: Physical management devices and/or pharmacologic management may be used to protect the patient, EMS personnel, and bystanders. See the management of agitated/violent patients and behavioral emergencies guideline.

G. All patients who are not making rational decisions should be transported for medical evaluation.*

Threat of suicide, overdose of medication, drugs, or alcohol, and/or threats to the health and well-being of others are not considered rational.

*Refer to the patient refusal guideline

H. Patients exhibiting delirium with agitated behavior

1. Agitated patient

EMT

a. An agitated patient has been described as an individual who displays excessive verbal or motor activity including physical or verbal abuse, threatening gestures or language, physical destructiveness, and/or excessive verbalization of distress

b. Enough providers should be on the scene to adequately handle the situation. Secure the scene and use universal precautions. Police should be involved as necessary. Providers should utilize the “least restrictive method of restraint” meaning the patient should be provided with alternatives to correct inappropriate behavior in order to obtain and maintain a positive relationship.

c. Providers should always be considerate of their own safety. Never underestimate the potential for violence or turn your back on a potentially violent patient.

AEMT

d. If necessary, initially sedate the patient as necessary by administering midazolam (Versed®) 2-5 mg at a time via mucosal atomizing device (MAD) up to 10 mg total or 0.1 mg/kg.

e. If the administration of ketamine is anticipated or required, the pre-treatment of the patient with midazolam is suggested to reduce the cardiovascular stimulation and the emergence delirium that can occur with ketamine.

PARAMEDIC

f. Sedation can be continued using ketamine (Ketalar®) 4 mg/kg IM or 1-1.5 mg/kg IV

g. Assess ABCs and obtain vital signs

h. Establish IV access with normal saline

i. Use physical patient management devices if the patient is perceived to be a threat to themselves or others

2. Delirium with agitated behavior

EMT

a. The presentation of delirium with agitated behavior has been described as “a state of extreme mental and physiological excitement” characterized by exceptional agitation and hyperactivity, overheating, excessive tearing of the eyes, hostility, superhuman strength, aggression, acute paranoia, and “endurance without apparent fatigue”. Individuals displaying this behavior may have been struck by a TASER® or restrained by law enforcement personnel prior to EMS arrival.

b. Using the acronym PRIORITY, EMS should look for the following:
P - Psychological issues
R – Recent drug/alcohol use
I – Incoherent through processes
O – Off (clothes) and sweating
R – Resistant to presence and/or dialogue
I – Inanimate objects/shiny/glass (violent toward)
T – Tough, unstoppable, superhuman strength
Y - Yelling

AEMT

c. Sedate the patient as necessary by administering midazolam (Versed®) via mucosal atomizing device (MAD) 2-5 mg at a time up to 10 mg total dose or 0.1 mg/kg to a maximum of 10 mg

PARAMEDIC

d. Versed® may be administered via MAD or IVP with a maximum total dose of 10mg

e. Assess ABCs

f. Obtain vital signs, pulse oximetry, and temperature if possible

g. Sedation can be continued with ketamine 4 mg/kg IM or 1-1.5 mg/kg IV

h. Establish IV access with normal saline

i. If the patient has been struck by a TASER®, had extensive muscle activity, or has an elevated skin temperature, initiate 500 ml fluid bolus of, preferably cold, normal saline over 20 minutes with, if available, 25 mEq sodium bicarbonate added to the IV bag

j. Use restraints if the patient is perceived to be a threat to themselves or others

EMT

A. Open airway and check for breathing

1. Airway obstructed:

a. Manual clearing

b. Abdominal or chest thrust

c. Suction orally or endotracheally through an established airway or a stoma

d. If airway cannot be cleared in 60 seconds:

i. Transport immediately to nearest hospital

ii. Do not take history

iii. Do not make further physical assessment

2. Airway is open, breathing absent, pulse present:

a. Ventilate patient 100% oxygen by two-person bag valve mask or oxygen powered, manually triggered or automatic transport ventilation device with nasal or oral airway once every five seconds

b. Ventilation should be delivered over two seconds and cricoid pressure should be considered to help reduce gastric distention

3. Airway is open and patient is in distress:

a. Administer 100% O_2 by NRB mask and consider continuous positive airway pressure (CPAP-see Special Procedures chapter)

b. Be prepared to assist ventilations;

c. Evaluate breath sounds:

i. Clear breath sounds: Treat cause - (MI, pulmonary embolism, metabolic disturbance, hyperventilation). Transport.

ii. Wheezes present:

(a) Minor allergic reaction: Support with oxygen, observe patient carefully. Transport

(b) Severe allergic reaction (allergy, asthma)

(i) Secure airway and support with oxygen

(ii) Ask patient or bystanders if epinephrine 1mg/1ml by auto-injector has been prescribed for these situations and do they have the medication with them

(iii) If medication is not available, transport immediately unless ALS unit is enroute and has an ETA of less than 5 minutes (consider transport time)

(iv) If medication is available:

(aa) Assure medication is prescribed for patient

(bb) Check medication - cloudiness, expiration date, administration method

(cc) Contact medical direction, if possible

(dd) Administer medication in mid-thigh and hold injector firmly against leg for at least ten seconds to assure all medication is injected

(ee) Record patient reaction to medication and relay to medical direction including vital signs

(ff) Transport immediately

(c) Patient with COPD (emphysema, asthma, bronchitis)

(i) Minor distress:

(aa) Put patient in position of comfort, support with low flow oxygen

(ii) Severe distress:

(aa) Set patient up, assist ventilations with high flow O_2, consider CPAP

(bb) Ask patient or bystanders if a bronchodilator by inhaler has been prescribed for these situations and if they have the medication with them

(cc) If medication is not available, transport immediately unless ALS unit is enroute and has an ETA of less than 5 minutes (consider transport time)

(dd) If medication is available:

(i) Assure medication is prescribed for patient

(ii) Check medication - expiration date, administration method

(iii) Contact medical direction, if possible

(iv) Administer medication by having the patient exhale, then activate spray during inhalation, and have patient hold breath for ten seconds so medication can be absorbed. Use a spacer if available. If the patient has a nebulizer, the EMT may assist the patient with the patient's self-administration of nebulized medications.

(v) Record patient reaction to medication and relay to medical direction including vital signs

(vi) Transport immediately

iii. Rales present (pulmonary edema)

(a) Sit patient upright, administer high flow oxygen by NRB, BVM or CPAP, and transport

iv. Breath sounds absent

(a) Treat cause: pneumothorax, hemothorax, lower airway obstruction

B. Pulse oximeter and/or capnography device and monitor patient condition and treat accordingly

C. Evaluate patient's general appearance, relevant history of condition, and determine:

Onset of the event
Provocation or palliation
Quality of the pain
Region and radiation
Severity
Time

Signs and symptoms
Allergies
Medications
Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Last oral intake
Events leading to present illness

D. Contact medical direction, advise of patient condition, and transport

AEMT

A. Assist EMT; obtain patient condition and circumstance

B. Reassess breath sounds and treat as follows:

1. Airway open, breath sounds absent

a. Endotracheal intubation

b. Provide 100% O_2 by BVM or PPV

c. Treat cause and transport

2. Airway obstructed:

a. Try to visualize obstruction with laryngoscope if basic procedures are unsuccessful

i. Remove foreign body with Magill forceps if possible

3. Wheezes present:

a. Severe systemic allergic reaction

i. Give epinephrine 0.3 mg (1mg/1ml) by intramuscular injection

ii. May be repeated during transport if patient condition does not improve and medical direction has been contacted

iii. If caused by sting or bite, apply constricting band between bite and heart, and apply ice pack to slow swelling and spread of poison

iv. Apply monitor and check rhythm

v. Start heplock/saline lock or IV normal saline TKO while enroute to the hospital. Do not delay transport

vi. Administer Benadryl® (diphenhydramine) 1 mg/kg IVP or IM (maximum dose of 50 mg).

b. Patient with asthma:

i.. Minor distress:

(a) Put patient in position of comfort, support with oxygen

(b) Consider Proventil® (albuterol) breathing treatment: 2.5 mg of Proventil® (albuterol) in 3 ml NS aerosol unit with oxygen flow at 8 liters per minute

ii. Severe distress:

(a) Sit patient up, assist ventilations with high flow oxygen, consider continuous positive airway pressure (CPAP-see Special Procedures)

(b) Proventil® (albuterol) breathing treatment: 2.5 mg in 3 ml NS of Proventil® in aerosol unit with oxygen flow at 8 liters per minute

(c) Contact medical direction for possible administration of epinephrine or glucagon.

(d) Start IV saline

c. Patient with COPD:

i. Minor distress:

(a) Put patient in position of comfort, support with low flow oxygen

(b) Proventil® (albuterol) breathing treatment: 2.5 mg of Proventi®l (albuterol) in 3 ml NS aerosol unit with oxygen flow at 8 liters per minute

ii. Severe distress:

(a) Sit patient up, assist ventilations with high flow oxygen, consider continuous positive airway pressure (CPAP-see Special Procedures)

(b) Proventil® (albuterol) breathing treatment: 2.5mg of Proventil® (albuterol) in 3 ml NS aerosol unit with oxygen flow at 8 liters per minute

(c) Start IV normal saline

4. Rales present:

    a.. Pulmonary edema:

        i. Look for and note cyanosis, hypotension, coughing, wheezing, labored breathing, diaphoresis, pitting edema, tachypnea, apprehension, and inability to talk

        ii. Patient has normal blood pressure or is hypertensive:

            (a) Maintain oxygenation with high flow oxygen or continuous positive airway pressure (CPAP)

            (b) Administer sublingual nitroglycerin 0.4 mg three times at five-minute intervals (tablet or spray)

            Maintain BP above 100 systolic

            (c) Transport patient

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. Reassess breath sounds and treat as follows:

1. Airway open, breath sounds absent

    a. Endotracheal intubation per the endotracheal intubation guideline

    b. Provide 100% O_2 by BVM or PPV

    c. Treat cause and transport

2. Airway obstructed:

    a. Try to visualize obstruction with laryngoscope if basic procedures are unsuccessful

        i. Remove foreign body using Magill forceps if possible

    b. If airway cannot be cleared, perform a cricothyrotomy

3. Spontaneous breathing with breath sounds:

    a. Clear breath sounds:

        i. Treat cause - (MI, pulmonary embolism, metabolic disturbance, hyperventilation)

    b. Wheezes present:

        i. Severe systemic allergic reaction

            (a) Start IV normal saline

            (b) Give epinephrine 0.3 mg (1mg/1ml) by intramuscular injection

            (c) Consider seeking medical direction

            (d) If patient is hypotensive and IV has been established, epinephrine 0.5 mg (0.1mg/1ml) IVP slowly

(e) If caused by sting or bite, apply constricting band between bite and heart, apply ice pack to slow swelling and spread of poison

(f) In patients with hypertension, stroke, CAD, pregnancy, consider glucagon 1 mg IM or IV instead of epinephrine.

(g) Benadryl® (diphenhydramine) administered 1 mg/kg (50 mg max) IM or IV.

NOTE: This is especially indicated when drug reactions are suspected and systolic blood pressure is above 90 mm Hg.

(h) Proventil® (albuterol) breathing treatment: 2.5 mg of Proventil® in 3 ml NS aerosol unit with oxygen flow at 8 liters per minute

ii. Patient with asthma:

(a) Minor distress:
(i) Put patient in position of comfort, support with oxygen

(ii) Consider Proventil® (albuterol) breathing treatment: 2.5 mg of Proventil® (albuterol) in 3 ml NS aerosol unit with oxygen flow at 8 liters per minute

(b) Severe distress:
(i) Sit patient up, assist ventilations with high flow oxygen, consider continuous positive airway pressure (CPAP-See Special Procedures)

(ii) Proventil® (albuterol) breathing treatment: 2.5 mg of Proventil® in 3 ml NS aerosol unit with oxygen flow at 8 liters per minute

(iii) Contact medical direction for possible administration of epinephrine or glucagon.

(c) Start IV normal saline

iii. Patient with COPD:

(a) Minor distress:

(i) Put patient in position of comfort, support with low flow oxygen

(ii) Proventil® (albuterol) breathing treatment: 2.5 mg of Proventil® (albuterol) in 3 ml NS aerosol unit with oxygen flow at 8 l/min.

(b) Severe distress:

(i) Sit patient up, assist ventilations with high flow oxygen, consider CPAP

(ii) Proventil® (albuterol) breathing treatment: 2.5 mg of Proventil® (albuterol) in 3 ml NS aerosol unit with oxygen flow at 8 l/min.

(iii) Start IV normal saline

c. Rales present:

i. Pulmonary edema:

(a) Look for and note cyanosis, hypotension, coughing, wheezing, labored breathing, diaphoresis, pitting edema, tachypnea, apprehension, and inability to talk

(b) Patient has normal blood pressure or is hypertensive:

(i) Maintain oxygenation with high flow oxygen or continuous positive airway pressure (CPAP). If lethargic or unresponsive, ventilate with a bag valve mask or initiate invasive airway management.

(ii) Administer sublingual nitroglycerin 0.4mg three times at five-minute intervals (tablet or spray)

Maintain BP above 100 systolic

(ii) Establish IV and administer Lasix® 1 mg/kg IV over one to two minutes.

(iii) Transport patient.

d. Breath sounds are asymmetrical or absent:

i. Spontaneous pneumothorax:

(a) Transport in position of comfort.

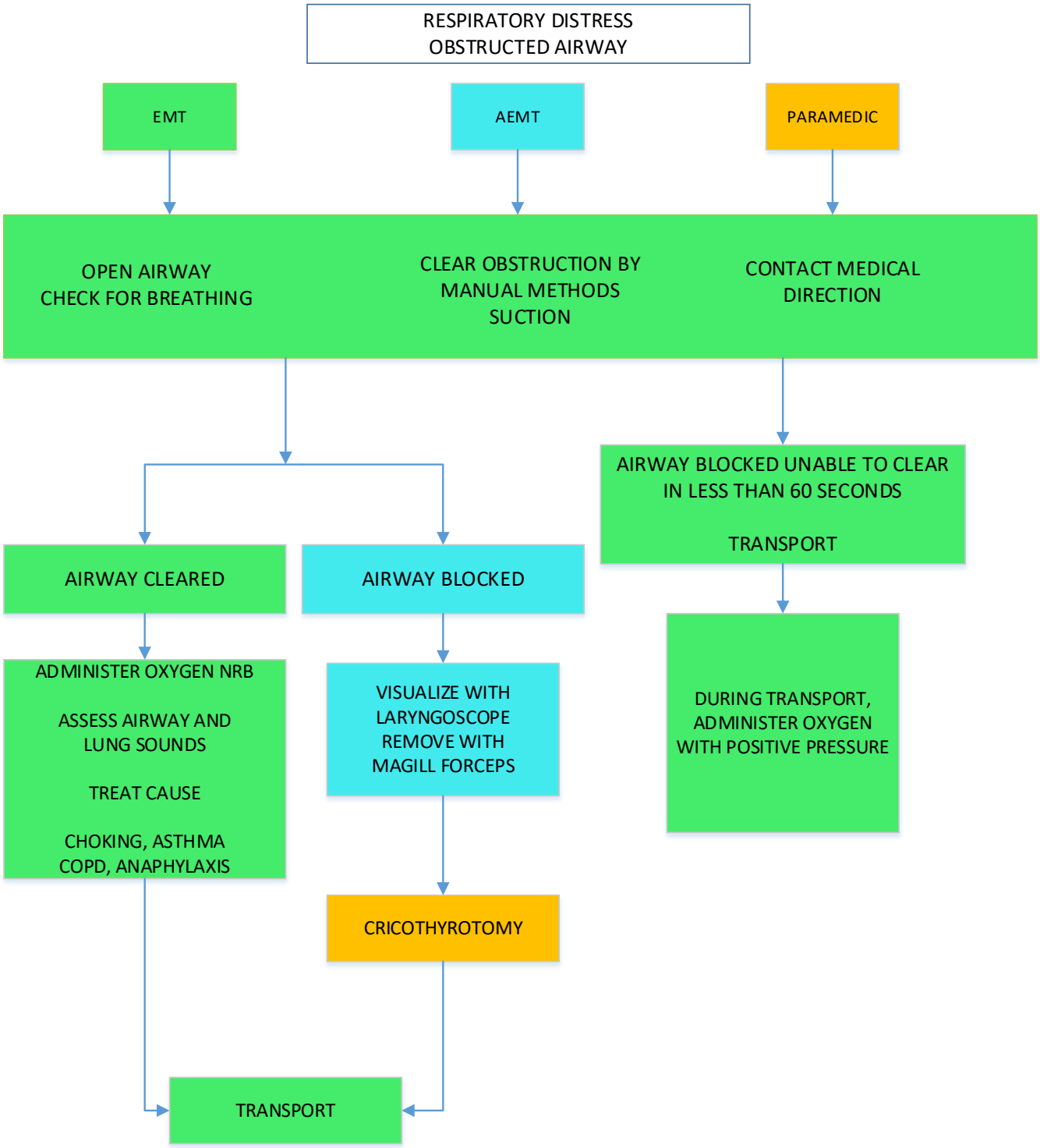
ii. Sucking chest wound:

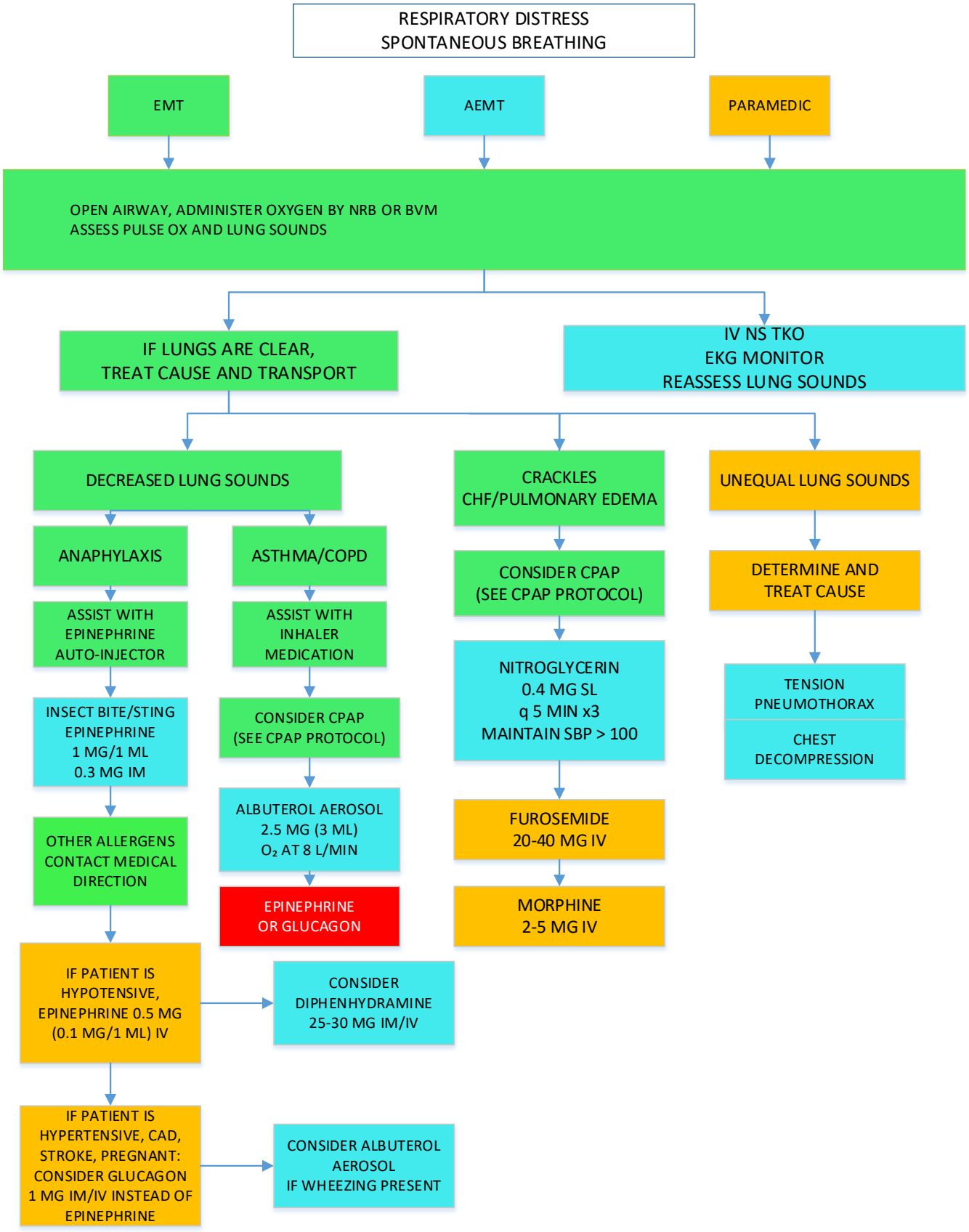
(a) Seal open wound on 3 sides and monitor for tension pneumothorax

iii. Tension pneumothorax

(a) Pleural decompression

iv. Lower airway obstruction


RESPIRATORY DISTRESS
OBSTRUCTED AIRWAY
EMT
AEMT
PARAMEDIC
OPEN AIRWAY
CHECK FOR BREATHING
CLEAR OBSTRUCTION BY
MANUAL METHODS
SUCTION
CONTACT MEDICAL
DIRECTION
AIRWAY BLOCKED UNABLE TO CLEAR
IN LESS THAN 60 SECONDS
TRANSPORT
AIRWAY CLEARED
AIRWAY BLOCKED
ADMINISTER OXYGEN NRB
ASSESS AIRWAY AND
LUNG SOUNDS
TREAT CAUSE
CHOKING, ASTHMA
COPD, ANAPHYLAXIS
VISUALIZE WITH
LARYNGOSCOPE
REMOVE WITH
MAGILL FORCEPS
DURING TRANSPORT,
ADMINISTER OXYGEN
WITH POSITIVE PRESSURE
CRICOTHYROTOMY
TRANSPORT


RESPIRATORY DISTRESS
SPONTANEOUS BREATHING
EMT
AEMT
PARAMEDIC
OPEN AIRWAY, ADMINISTER OXYGEN BY NRB OR BVM
ASSESS PULSE OX AND LUNG SOUNDS
IF LUNGS ARE CLEAR,
TREAT CAUSE AND TRANSPORT
IV NS TKO
EKG MONITOR
REASSESS LUNG SOUNDS
DECREASED LUNG SOUNDS
CRACKLES
CHF/PULMONARY EDEMA
UNEQUAL LUNG SOUNDS
ANAPHYLAXIS
ASTHMA/COPD
CONSIDER CPAP
(SEE CPAP PROTOCOL)
DETERMINE AND
TREAT CAUSE
ASSIST WITH
EPINEPHRINE
AUTO-INJECTOR
ASSIST WITH
INHALER
MEDICATION
NITROGLYCERIN
0.4 MG SL
q 5 MIN x3
MAINTAIN SBP > 100
TENSION
PNEUMOTHORAX
CHEST
DECOMPRESSION
INSECT BITE/STING
EPINEPHRINE
1 MG/1 ML
0.3 MG IM
CONSIDER CPAP
(SEE CPAP PROTOCOL)
ALBUTEROL AEROSOL
2.5 MG (3 ML)
O2 AT 8 L/MIN
FUROSEMIDE
20-40 MG IV
OTHER ALLERGENS
CONTACT MEDICAL
DIRECTION
EPINEPHRINE
OR GLUCAGON
MORPHINE
2-5 MG IV
IF PATIENT IS
HYPOTENSIVE,
EPINEPHRINE 0.5 MG
(0.1 MG/1 ML) IV
CONSIDER
DIPHENHYDRAMINE
25-30 MG IM/IV
IF PATIENT IS
HYPERTENSIVE, CAD,
STROKE, PREGNANT:
CONSIDER GLUCAGON
1 MG IM/IV INSTEAD OF
EPINEPHRINE
CONSIDER ALBUTEROL
AEROSOL
IF WHEEZING PRESENT

GENERAL CONSIDERATIONS

A. Seizures usually have resolved by the time the EMS professionals arrive (postictal state)

B. The basic rule with seizures is to "protect and support" the patient. If trauma, consider appropriate cervical spinal care.

C. Aspiration precautions include:

1. Coma position: a side lying position with the head lowered 15 to 30 degrees
2. Suction readily available
3. If possible, mouth cleared of foreign bodies (food, gum, dentures)

EMT

A. Place patient away from objects on which they might injure themselves; protect but do not restrain them

B. Clear and maintain airway, consider cervical spine injury

C. Administer oxygen with the goal of achieving a pulse ox of 94-98%

D. Obtain history from bystanders:

1. Seizure history
2. Description of onset of seizure
3. Medications
4. Other known medical history (especially head trauma, diabetes, drugs, alcohol, stroke, heart disease)

E. Evaluate:

1. Evidence of head trauma
2. Substance abuse

F. Bring medication with patient if available

G. Establish communications with medical direction and advise of patient condition. Transport immediately unless an Advanced Life Support unit is enroute and has an ETA of less than 5 minutes.

H. Check a blood glucose. If < 60 mg/dL, administer oral glucose only if the patient can protect their airway

AEMT

A. Assist EMS professionals, obtain patient condition and circumstance

B. Apply monitor and check rhythm

C. Establish a heplock/saline lock or IV normal saline TKO while enroute to hospital if seizures are persistent or recurrent. Do not delay transport.

D. Determine blood sugar level

1. Blood sugar < 60 mg/dl, administer 25 gm of dextrose in water IV push immediately or glucagon 1 mg IM.

E. In repeated seizure activity, administer midazolam (Versed®) IV/IM/IN or diazepam (Valium®) IV/IM

1. Initial dose of midazolam 2-5 mg IVP with repeated doses every 2 minutes as needed or midazolam 10 mg intranasal
2. Initial dose of diazepam 5 mg IVP and titrate to patient's condition up to a 10 mg maximum

F. After the administration of midazolam or diazepam, monitor airway, apply a pulse oximeter (and capnography, if available), and be prepared to intubate and/or assist ventilation with a BVM or PPV

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. Make sure patient has good airway. If in status epilepticus, nasotracheal intubation may be necessary

C. Establish heplock/saline lock or IV normal saline TKO if seizures are persistent or recurrent.

D. Determine blood sugar level

1. Blood sugar < 60 mg/dl, administer 25 gm of dextrose in water IV push immediately or glucagon 1 mg IM.

E. In repeated seizure activity, administer midazolam (Versed®) IV/IM/IN or diazepam (Valium®) IV/IM

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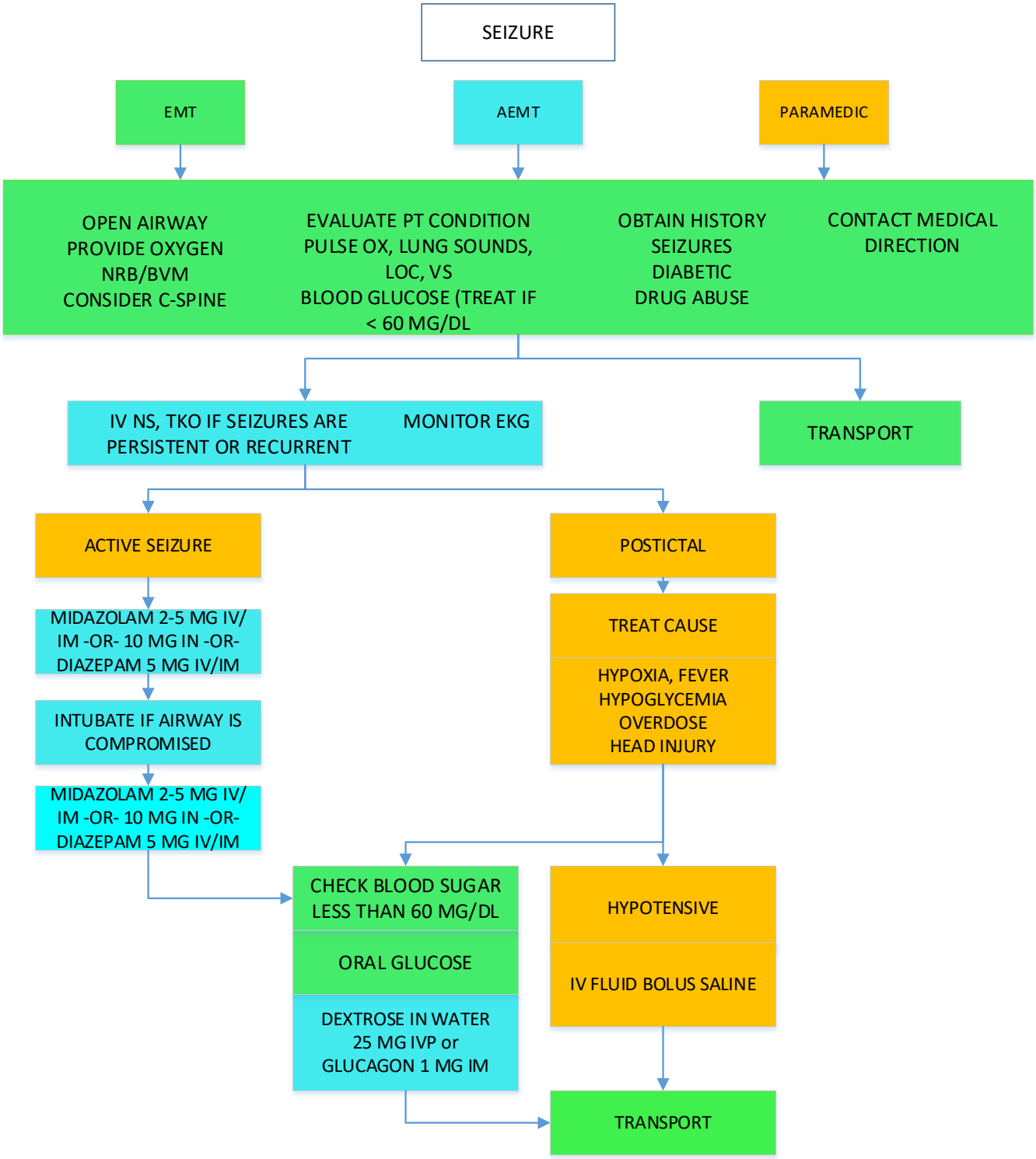
F. After the administration of midazolam or diazepam, monitor airway, apply a pulse oximeter (and capnography, if available), and be prepared to intubate and/or assist ventilation with BVM or PPV. If in status epilepticus, nasotracheal intubation may be necessary


SEIZURE
EMT
AEMT
PARAMEDIC
OPEN AIRWAY
PROVIDE OXYGEN
NRB/BVM
CONSIDER C-SPINE
EVALUATE PT CONDITION
PULSE OX, LUNG SOUNDS,
LOC, VS
BLOOD GLUCOSE (TREAT IF
< 60 MG/DL
OBTAIN HISTORY
SEIZURES
DIABETIC
DRUG ABUSE
CONTACT MEDICAL
DIRECTION
IV NS, TKO IF SEIZURES ARE
PERSISTENT OR RECURRENT
MONITOR EKG
TRANSPORT
ACTIVE SEIZURE
MIDAZOLAM 2-5 MG IV/
IM -OR- 10 MG IN -OR-
DIAZEPAM 5 MG IV/IM
INTUBATE IF AIRWAY IS
COMPROMISED
MIDAZOLAM 2-5 MG IV/
IM -OR- 10 MG IN -OR-
DIAZEPAM 5 MG IV/IM
POSTICTAL
TREAT CAUSE
HYPOXIA, FEVER
HYPOGLYCEMIA
OVERDOSE
HEAD INJURY
CHECK BLOOD SUGAR
LESS THAN 60 MG/DL
ORAL GLUCOSE
DEXTROSE IN WATER
25 MG IVP or
GLUCAGON 1 MG IM
HYPOTENSIVE
IV FLUID BOLUS SALINE
TRANSPORT

GENERAL CONSIDERATIONS

A. Shock is the failure of the body to circulate blood and oxygen properly and perfuse body tissue

B. Shock is classified as and can be due to:

1. Hypovolemic - fluid loss
2. Cardiogenic - pump failure
3. Neurogenic - vasodilation
4. Anaphylactic - allergic reaction
5. Septic - infection, vasodilatation
6. Respiratory - lack of oxygen

C. Priorities of care in shock situations are:

1. Provide an adequate airway and oxygenation
2. Recognize the type of shock present and its treatment
3. Replace body fluids

EMT

A. Establish airway and administer 100% oxygen by NRB mask. Assist ventilation as required with an oral or nasal airway and BVM. Obtain pulse oximeter reading and treat accordingly.

B. Obtain relevant medical history: Identify the cause

C. Place patient in proper shock position:

1. Hypotension - lying flat with feet elevated
2. Respiratory difficulty - head elevated

D. Maintain body temperature:

1. Patient cold - Warm them up
2. Patient hot - Cool them down

E. Treat the cause

F. Anaphylaxis from any cause (insect bite or sting, food, medication, unknown agent):

1. Breathing difficulty, hives, itching, and/or swelling with low blood pressure: Give epinephrine 0.3 mg (1mg/1ml) via auto-injector

2. Hives, itching, and/or swelling with a normal blood pressure: Contact medical direction as soon as possible.

G. Evaluate the patient's:

1. Respiratory status
2. Circulatory status - pulse, BP
3. Level of consciousness
4. Evidence of trauma to abdomen, chest, head

H. Establish communications with medical direction and advise of patient condition. Transport immediately unless an advanced life support unit is enroute and has an ETA of less than 5 minutes.

AEMT

A. Assist EMS professionals and obtain patient condition and circumstance

B. Hypovolemic, neurogenic, or septic shock

1. During transport to the hospital, start IV normal saline. Do not delay transport.

C. Anaphylaxis from any cause (insect bite or sting, food, medication, unknown agent):

1. Breathing difficulty with low blood pressure

a. Start IV of normal saline and initiate a bolus until the hypotension resolves

b. Give epinephrine 0.3 mg (1mg/1ml) intramuscularly or via auto-injector

2. Hives, itching, and/or swelling with a normal blood pressure: Contact medical direction for as soon as possible.

D. Apply monitor and check rhythm

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. Apply monitor and follow appropriate arrhythmia guideline

C. Identify type of shock and treat as follows:

1. Hypovolemic, neurogenic, septic

a. Start IV of normal saline. Infuse until systolic blood pressure is above 100 mm Hg (up to 30 mL/kg if sepsis is clinically suspected or if a point-of-care lactate is elevated).

b. If transport will be prolonged or if entrapment exists, contact medical direction

c. If hypovolemic shock persists despite above measures, start second IV of normal saline

2. Cardiogenic

a. Treat cause by following the appropriate arrhythmia, chest pain, or cardiac arrest guidelines.

b. If patient has BP of less than 70-90 mm Hg systolic with poor profusion:

i. Establish second IV in large peripheral vessel for vasopressor administration:

(a) Norepinephrine 0.05–0.5 mcg/kg/minute IV or epinephrine, 0.05–0.3 mcg/kg/minute IV titrated to an improved blood pressure or a mean arterial pressure ≥ 65.

(b) If norepinephrine and epinephrine are not available, dopamine 2–20 mcg/kg/minute IV can be administered.

NOTE: If IV infiltrates, report to the ED physician as soon as possible

i. Establish a heplock/saline lock or a second IV normal saline TKO in large peripheral vein if time permits

3. Anaphylactic

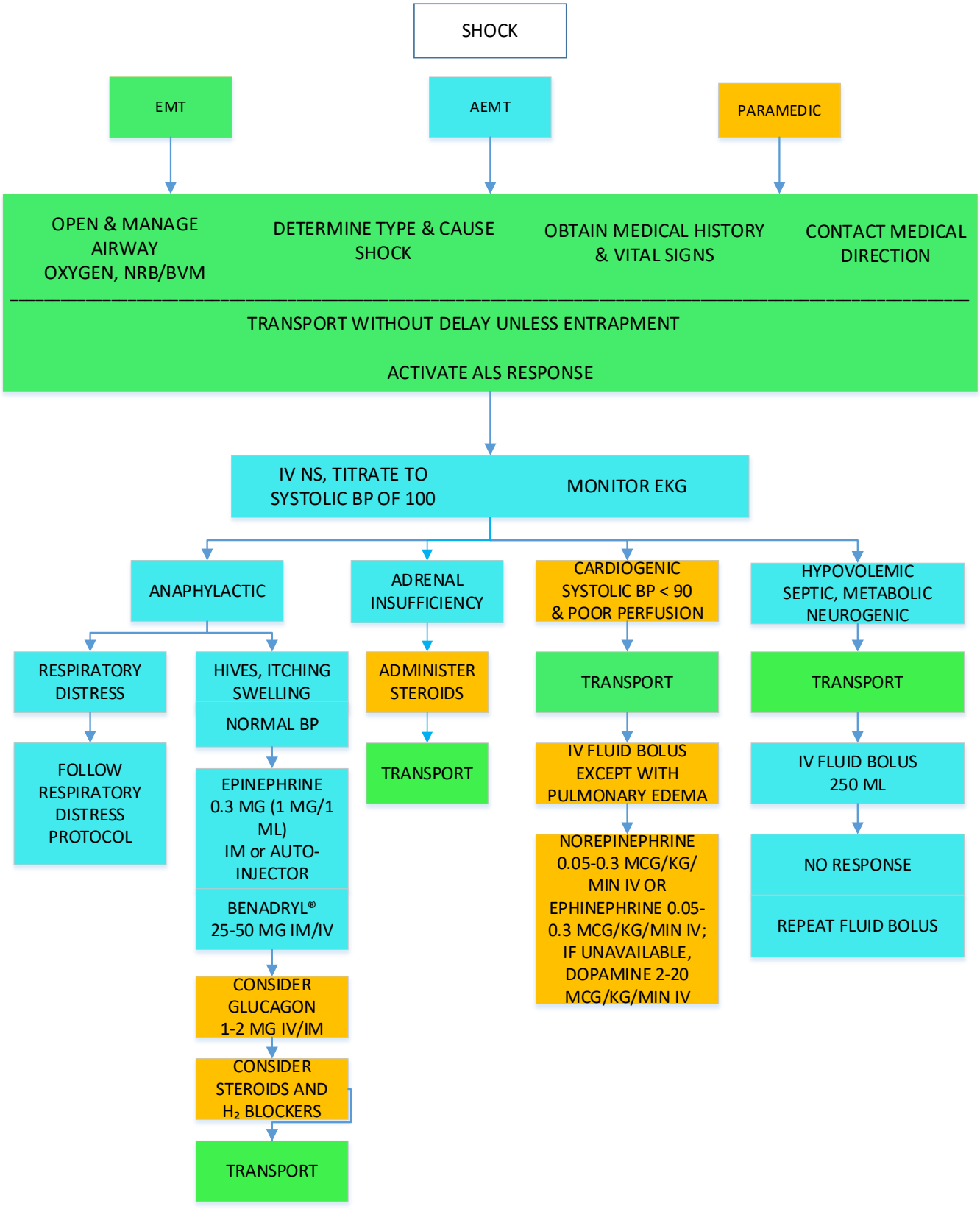
a. Respiratory distress, follow the respiratory distress guideline

b. Hives, itching, and/or swelling normal BP: Contact medical direction for possible administration of epinephrine and/or Benadryl®

c. If patient is on beta blocking medication, hypertensive, has known coronary artery disease, and/or is pregnant, consider administering glucagon 1-2 mg IV or IM.

4. Adrenal insufficiency
This is a rare cause of shock. It can occur in patients with a history of adrenal insufficiency or long-term steroid dependence. If this cause of shock is suspected or in the case of fluid-refractory shock requiring vasopressors, consider the administration of steroids.

- Hydrocortisone succinate, 2 mg/kg (maximum 100 mg) IV/IM (preferred)
- Methylprednisolone 2 mg/kg IV (maximum 125 mg)
- Dexamethasone 0.6 mg/kg IV/IM (maximum dose of 16 mg)


SHOCK
EMT
AEMT
PARAMEDIC
OPEN & MANAGE AIRWAY OXYGEN, NRB/BVM
DETERMINE TYPE & CAUSE SHOCK
OBTAIN MEDICAL HISTORY & VITAL SIGNS
CONTACT MEDICAL DIRECTION
TRANSPORT WITHOUT DELAY UNLESS ENTRAPMENT
ACTIVATE ALS RESPONSE
IV NS, TITRATE TO SYSTOLIC BP OF 100
MONITOR EKG
ANAPHYLACTIC
ADRENAL INSUFFICIENCY
CARDIOGENIC SYSTOLIC BP < 90 & POOR PERFUSION
HYPOVOLEMIC SEPTIC, METABOLIC NEUROGENIC
RESPIRATORY DISTRESS
HIVES, ITCHING SWELLING
NORMAL BP
FOLLOW RESPIRATORY DISTRESS PROTOCOL
EPINEPHRINE 0.3 MG (1 MG/1 ML) IM or AUTO-INJECTOR
BENADRYL® 25-50 MG IM/IV
CONSIDER GLUCAGON 1-2 MG IV/IM
CONSIDER STEROIDS AND H2 BLOCKERS
TRANSPORT
ADMINISTER STEROIDS
TRANSPORT
TRANSPORT
IV FLUID BOLUS EXCEPT WITH PULMONARY EDEMA
NOREPINEPHRINE 0.05-0.3 MCG/KG/MIN IV OR EPHINEPHRINE 0.05-0.3 MCG/KG/MIN IV; IF UNAVAILABLE, DOPAMINE 2-20 MCG/KG/MIN IV
TRANSPORT
IV FLUID BOLUS 250 ML
NO RESPONSE
REPEAT FLUID BOLUS

ACUTE STROKE

GENERAL CONSIDERATIONS

A. Patients who experience a transient ischemic attack (TIA) develop most of the same signs and symptoms as those who are experiencing a stroke. The signs and symptoms of TIAs can last from minutes up to a few hours. Thus, the patient may initially present with typical signs and symptoms of a stroke, but those findings may progressively resolve. TIAs are frequently a warning sign of impending stroke. Therefore, the patient needs to be transported, without delay, to the most appropriate hospital for further evaluation even if the TIA has resolved.

B. Some patients who have had a stroke may be unable to communicate but can understand what is being said to and around them.

C. Place the patient's affected or paralyzed extremity in a secure and safe position during patient movement and transport.

D. Hypertension in stroke patients routinely should not be treated in the prehospital setting. Any treatment of hypertension should be completed with on-line medical direction. Nitroglycerin should not be used unless signs and symptoms consistent with acute myocardial infarction (AMI) are present.

E. New therapies for stroke are now available. Stroke patients can receive effective acute treatment up to 24 hours after the onset of symptoms. Early notification of the receiving hospital and minimizing scene time are important elements of a strategy to treat stroke patients quickly and improve patient outcomes.

F. Time of onset of signs and symptoms must always be obtained, documented, and relayed to the receiving facility. Time of onset is defined as the time the patient was last known to be at their normal baseline unless the onset was witnessed. Time of onset of symptoms needs to be accurately determined for consideration of thrombolytic therapy or endovascular intervention. In patients whose symptoms were present upon awakening, their symptom onset is estimated from the last time that the patient's neurologic status was known to be at their normal baseline neurologic status or the time just prior to going to sleep ("last known well").

G. When obtaining the patient's medical history, ask the patient or family members on scene if the patient takes warfarin or any other anticoagulant medication. If known by the patient or the family, obtain the medical condition for which the patient has been prescribed an anticoagulant and if the patient has fallen during the onset of stroke symptoms or has sustained recent trauma.

H. A validated prehospital stroke scale and a validated prehospital stroke severity scale should be used during the assessment of a stroke patient. If available, telemedicine is a valuable adjunct for patient assessment and triage. Currently, there is no evidence-based research that demonstrates that one prehospital stroke assessment tool is superior compared to others. In addition, stroke scales have not been validated for pediatric patients. A validated prehospital stroke scale may include, but is not limited to, assessment of:

    1. Facial droop/smile/grimace
    2. Arm drift
    3. Speech

    A validated prehospital stroke severity scale may include, but is not limited to, presence of:

    1. Vision disturbance
    2. Aphasia
    3. Sensory neglect

I. Patients who are poorly responsive to verbal or painful stimuli, exhibiting decorticate or decerebrate posturing, or have a rapid decline in their neurologic status need ALS as soon as possible.

J. The acuity of hospitals with certified stroke centers includes acute stroke ready, primary stroke, thrombectomy-capable, and comprehensive stroke centers. Certified thrombectomy-capable and

comprehensive stroke centers have endovascular thrombectomy (EVT) capabilities for the treatment of stroke victims with a large vessel occlusion (LVO).

K. Patients for whom the onset of stroke symptoms can be confirmed within 24 hours or less of the activation of initiation of the emergency response system should be transported directly to a certified stroke center based upon the local resources and stroke system of care. Patients with a suspected LVO based upon the use of a stroke severity tool should be transported to a thrombectomy-capable or comprehensive stroke center if the additional transport time is not more than 15 – 30 minutes. At a minimum and as a secondary option, the patient with a suspected acute stroke should be transported to a hospital with a functioning CT scanner and emergent radiology services available.

EMT

A. Open and manage the airway and provide oxygen by nasal cannula 4 L/min and increase as needed with respiratory distress.

1. Apply pulse oximeter and treat per procedure. Maintain 94 – 98% SpO_2.

2. Be prepared to oxygenate and/or assist ventilations with oral or nasal airway and BVM or PPV.

B. Evaluate patient's general appearance, relevant history of condition and determine:

Onset of the event
Provocation or palliation
Quality of the pain
Region and radiation
Severity
Time

Signs and symptoms
Allergies
Medications
Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
Last oral intake
Events leading to present illness

C. Determine blood glucose level.

1. For a blood glucose < 60 mg/dL, administer 1 tube of oral glucose. May be repeated in 10 minutes if blood glucose remains below 60 mg/dL.

PATIENT MUST HAVE A GAG REFLEX

2. Blood glucose ≥ 60 mg/dL, begin immediate transport.

D. If unable to check blood glucose, with signs of stroke, establish communications with medical direction and advise of patient condition.

E. Transport immediately unless an ALS unit is enroute for a stroke patient with severe or worsening symptoms and has an ETA of less than 5 minutes to the scene.

AEMT

A. Assist EMS professionals, obtain patient condition and circumstance.

B. Apply monitor and check rhythm.

C. Start heplock/saline lock or IV normal saline TKO while enroute to hospital.

D. Determine blood glucose level.

1. If blood glucose less < 60 mg/dL, administer dextrose 25 Gm IV push or glucagon 1 mg IM. The administration may be repeated in 10 minutes if blood glucose remains below 60 mg/dL.

DO NOT DELAY TRANSPORT

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation.

B. If patient does not have a secure protected airway, intubate per the endotracheal intubation guideline.

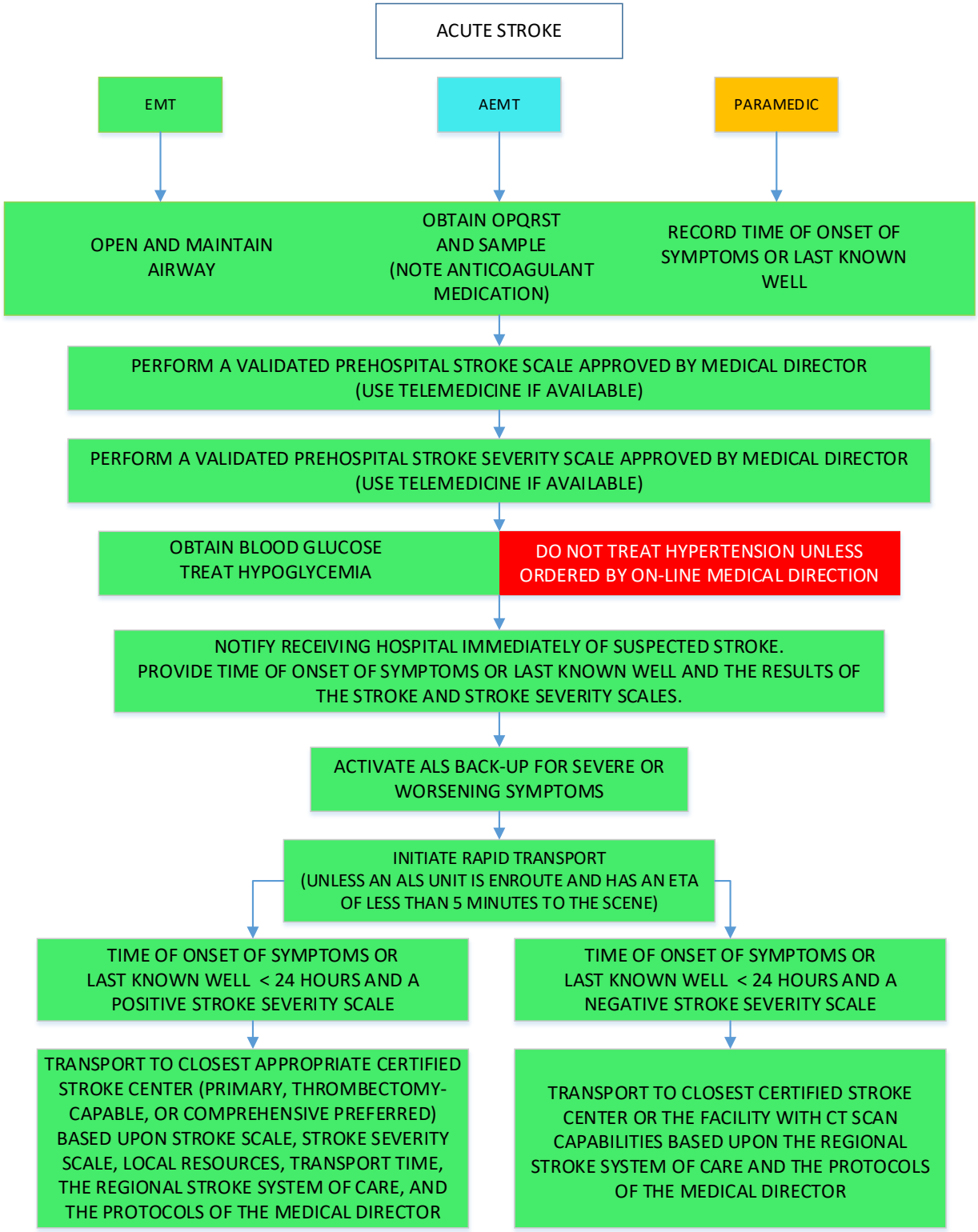
C. Apply monitor and check rhythm.

D. Establish heplock/saline lock or IV normal saline TKO.

E. Determine blood glucose level.

1. If blood glucose < 60 mg/dL, administer dextrose 25 g IV push or glucagon 1 mg IM. The administration may be repeated in 10 minutes if blood glucose remains below 60 mg/dL.

F. Re-evaluate patient condition, contact medical direction, and transport immediately to hospital.


ACUTE STROKE
EMT
AEMT
PARAMEDIC
OPEN AND MAINTAIN AIRWAY
OBTAIN OPQRST AND SAMPLE (NOTE ANTICOAGULANT MEDICATION)
RECORD TIME OF ONSET OF SYMPTOMS OR LAST KNOWN WELL
PERFORM A VALIDATED PREHOSPITAL STROKE SCALE APPROVED BY MEDICAL DIRECTOR (USE TELEMEDICINE IF AVAILABLE)
PERFORM A VALIDATED PREHOSPITAL STROKE SEVERITY SCALE APPROVED BY MEDICAL DIRECTOR (USE TELEMEDICINE IF AVAILABLE)
OBTAIN BLOOD GLUCOSE TREAT HYPOGLYCEMIA
DO NOT TREAT HYPERTENSION UNLESS ORDERED BY ON-LINE MEDICAL DIRECTION
NOTIFY RECEIVING HOSPITAL IMMEDIATELY OF SUSPECTED STROKE. PROVIDE TIME OF ONSET OF SYMPTOMS OR LAST KNOWN WELL AND THE RESULTS OF THE STROKE AND STROKE SEVERITY SCALES.
ACTIVATE ALS BACK-UP FOR SEVERE OR WORSENING SYMPTOMS
INITIATE RAPID TRANSPORT (UNLESS AN ALS UNIT IS ENROUTE AND HAS AN ETA OF LESS THAN 5 MINUTES TO THE SCENE)
TIME OF ONSET OF SYMPTOMS OR LAST KNOWN WELL < 24 HOURS AND A POSITIVE STROKE SEVERITY SCALE
TIME OF ONSET OF SYMPTOMS OR LAST KNOWN WELL < 24 HOURS AND A NEGATIVE STROKE SEVERITY SCALE
TRANSPORT TO CLOSEST APPROPRIATE CERTIFIED STROKE CENTER (PRIMARY, THROMBECTOMY-CAPABLE, OR COMPREHENSIVE PREFERRED) BASED UPON STROKE SCALE, STROKE SEVERITY SCALE, LOCAL RESOURCES, TRANSPORT TIME, THE REGIONAL STROKE SYSTEM OF CARE, AND THE PROTOCOLS OF THE MEDICAL DIRECTOR
TRANSPORT TO CLOSEST CERTIFIED STROKE CENTER OR THE FACILITY WITH CT SCAN CAPABILITIES BASED UPON THE REGIONAL STROKE SYSTEM OF CARE AND THE PROTOCOLS OF THE MEDICAL DIRECTOR

GENERAL CONSIDERATIONS

A. Assure scene is safe, initiate BSI (**B**ody **S**ubstance **I**solation) by donning the appropriate personal protective equipment (PPE), determine the mechanism of injury, determine the number of patients, and request additional help if needed.

B. Rapid assessment and recognition of major trauma/multiple system trauma is essential to the subsequent treatment

C. Once the patient is determined to be an actual or potential major/multiple system trauma patient, personnel on scene and/or medical direction must quickly determine the appropriate course of action including:

1. Requesting air medical evacuation from scene (see air medical transport guideline)

2. Ground transportation directly to an appropriate facility. (When requesting bypass of nearest facility, this action must be approved by medical direction)

D. In cases where the victim will be transported by ground units, every effort should be made to limit on-scene time to 10 minutes or less to minimize transport time

RAPID TRIAGE AND TRANSPORT IS CRITICAL!

E. If patient is entrapped or inaccessible, contact medical direction and advise of condition and circumstances

F. If time permits, each patient should be evaluated by the Glasgow Coma Scale and the score relayed to medical direction

EMT

A. Trauma Assessment

1. Initial assessment: Identify life threats, chief complaints, assess airway and initiate appropriate therapies, assess circulation and control major bleeding, establish a general impression of patient condition, and prioritize patients for transport

2. Urgent patient

a. Rapid trauma assessment: Complete a quick head-to-toe survey utilizing DCAP-BTLS (**D**eformities, **C**ontusions, **A**brasions, **P**unctures/penetrations - **B**urns, **T**enderness, **L**acerations, **S**welling). Obtain baseline vital signs and SAMPLE history.

b. Transport immediately

c. Detailed physical exam and ongoing assessment: During transport, evaluate patient head-to-toe and assess effectiveness of treatments to this point.

3. Non-urgent patient - single or non-life threatening injury

a. Focused physical exam of injured area and management of the situation.

b. Detailed physical exam and ongoing assessment - Evaluate patient head-to-toe and assess effectiveness of treatments to this point.

c. Transport patient

B. Urgent trauma treatment

1. Establish airway, breathing, and circulation and apply appropriate spinal care

2. Administer 100% oxygen and apply pulse oximeter

3. Control hemorrhage

4. Transport immediately unless ALS arrival on-scene is less than 5 minutes.

5. During transportation

a. Splint individual fracture

b. Evaluate the patient's:

i. Pulses distal to the fracture site
ii. Distal skin color, temperature, neurological status

c. Obtain relevant history:

i. Where, when, how
ii. Mechanism of injury

6. Establish communications with medical direction and advise of patient condition and need for a trauma team.

C. Non-urgent trauma treatment

1. Establish airway, breathing and circulation, and apply appropriate spinal care

2. Administer 100% oxygen and apply pulse oximeter

3. Control hemorrhage

4. Splint all fracture(s) (in non-life threatening situations only)

a. Evaluate the patient's:

i. Pulses distal to the fracture site
ii. Distal skin color, temperature, neurological status

5. Obtain relevant history:

a. Where, when, how

b. Mechanism of injury

D. Establish communications with medical direction and advise of patient condition.

AEMT

A. Assist EMS professionals; obtain patient condition and circumstance

B. Secure the airway and administer 100% oxygen. If the patient is apneic, intubate with cervical spine control

C. Start IV normal saline to maintain perfusion and systolic BP ≥ 90 mm Hg.
Establishing IV access must not delay transport.

D. Apply cardiac monitor and check rhythm

E. If the patient is conscious and alert and complaining of severe pain, administer morphine sulfate as follows:

1. Small frequent doses of 5 mg every 5 minutes and titrate to patient condition

2. Do not administer to patients with head trauma, chest injury, respiratory distress due to trauma or to any patient with volume depletion of any cause.

3. Consider morphine or other analgesic per local protocols

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation

B. Treat for shock per the shock guideline

C. If the patient is conscious and alert and complaining of severe pain, administer morphine sulfate as follows:

1. Small frequent doses of 5 mg every 5 minutes and titrate to patient condition

2. Do not administer to patients with head trauma, chest injury, respiratory distress due to trauma or to any patient with volume depletion of any cause.

3. Consider morphine or other analgesic per local protocols

SPECIFIC INJURIES

A. Chest Wounds

1. For sucking chest wounds or an open pneumothorax, cover the wound with a non-porous dressing sealing 3 sides, apply a vented chest seal, or leave the wound open.

2. Stabilize flail chest with trauma dressing

B. Evisceration

1. Cover organs with sterile dressing moistened with saline

2. Lay the patient flat and elevate the knees

C. Complete Amputations

1. Control bleeding by the most appropriate method. Rapid application of a tourniquet can be life-saving for arterial bleeding

2. Always take time to find the avulsed part, but do not delay patient transport. Transport the avulsed body part to the hospital as follows:

    a. Put avulsed body part in a cool, dry sterile dressing
    b. Avoid direct contact with ice

D. Pneumothorax / Hemothorax / Tension Pneumothorax:

1. Transport patient in position of comfort and watch for signs of a tension pneumothorax

2. Symptoms of tension pneumothorax:

    a. Chest pain or evidence of trauma
    b. Tachypnea
    c. Tachycardia
    d. JVD
    e. May initially exhibit hypertension progressing to hypotension
    f. Hyperresonance on affected side
    g. Diminished or absent breath sounds of affected side
    h. Audible wheeze
    a. Tracheal deviation away from affected side (latent sign)

NOTE: Significant tension pneumothorax may present exhibiting any or all of the above symptoms

3. Pleural decompression per procedure

E. Head Injury:

1. Evaluate patient condition:

    a. Level of Consciousness
    b. Pupillary size and reaction
    c. Glasgow Coma Scale

2. Transport with head elevated 8 to 10 inches by tilting backboard with the cervical spine immobilized

3. Maintain airway and support with 100% oxygen by NRB mask and/or BVM

    a. Orotracheal, nasotracheal, or digital intubation may be indicated if the patient is apneic and should be accomplished while gently maintaining in-line cervical spine immobilization

    b. Do not hesitate to take control of airway

    c. Hyperoxygenate when there are signs of cerebral herniation:

        i. Dilated pupils, bradycardia, posturing

F. Spinal Injuries:

1. Mechanism alone should not determine if a patient requires spinal motion restriction; however, the mechanisms listed below have been associated with a higher risk of injury
   a. Motor vehicle crashes (including automobiles, all-terrain vehicles, and snowmobiles)
   b. Axial loading injuries to the spine
   c. Falls greater than 10 feet

2. Place patient in a cervical collar if any of the following are present:
   a. The patient complains of midline neck or spine pain
   b. Any midline neck or spinal tenderness with palpation
   c. Any abnormal mental status (including extreme agitation)
   d. Focal or neurologic deficit
   e. Any evidence of alcohol or drug intoxication
   f. Another severe or painful distracting injury is present
   g. Torticollis in children
   h. A communication barrier that prevents accurate assessment

   If none of the above apply, the patient may be managed without a cervical collar

3. Patients with penetrating injury to the neck should not be placed in a cervical collar or other spine precautions regardless of whether they are exhibiting neurologic symptoms or not. Doing so can lead to delayed identification of injury or airway compromised and has been associated with increased mortality.

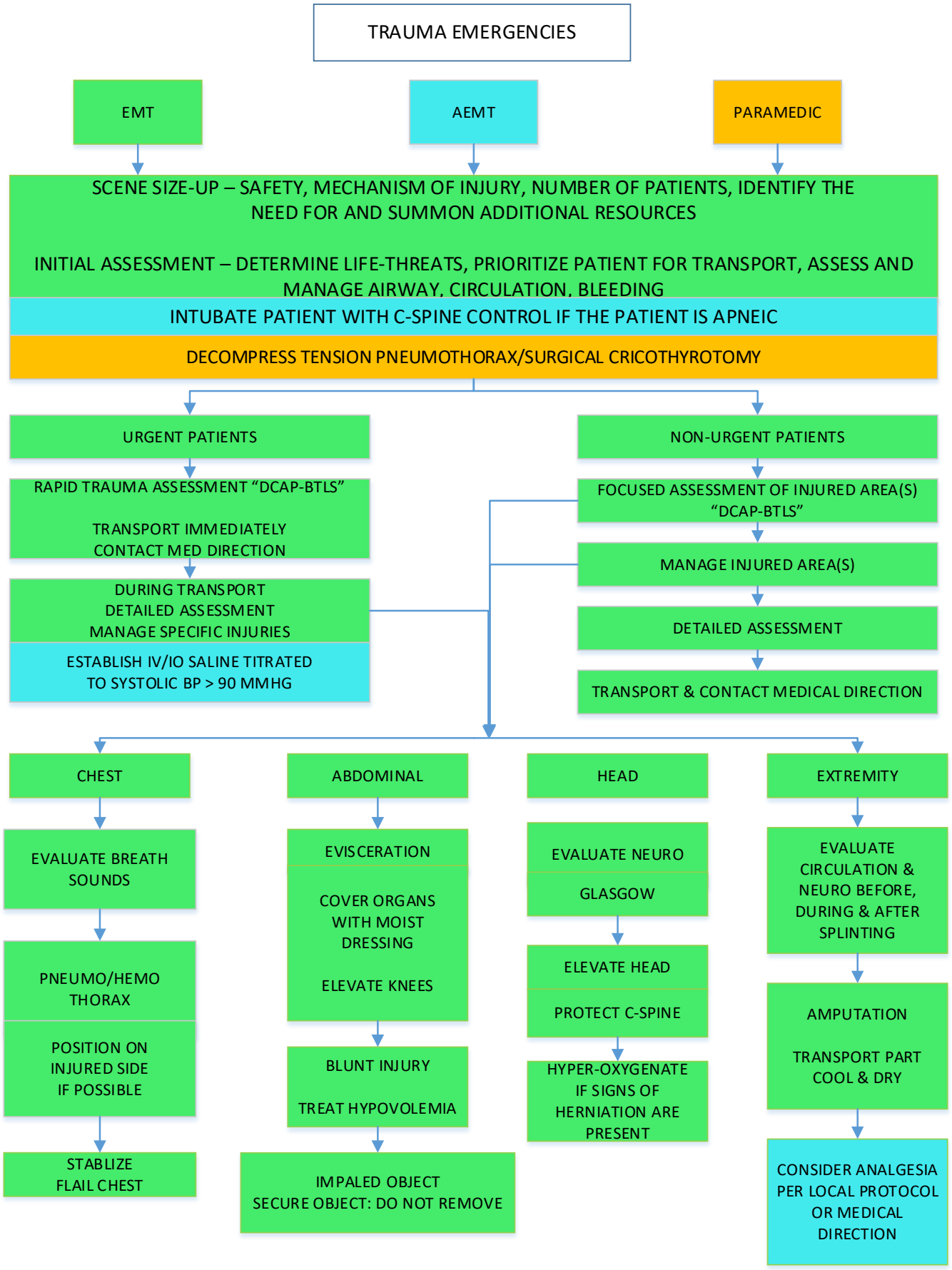
3. If patient is wearing a helmet, follow the helmet removal guideline in the Special Procedures chapter.

4. Do not transport patients on rigid long boards unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In these situations, long boards should ideally be padded or have a vacuum mattress applied to minimize secondary injury to the patient.

5. Patient with severe kyphosis or ankylosing spondylitis may not tolerate a cervical collar. These patients should be immobilized in a position of comfort using towel rolls or sand bags.

6. Always contact medical direction and relay information regarding patient to the hospital. Patients with spinal cord injuries may need to be delivered to another facility if the hospital initially contacted does not have the resources to adequately manage this injury.

7. If patient is alert and complaining of severe pain consider pain relief per local protocol.


TRAUMA EMERGENCIES
EMT
AEMT
PARAMEDIC
SCENE SIZE-UP – SAFETY, MECHANISM OF INJURY, NUMBER OF PATIENTS, IDENTIFY THE NEED FOR AND SUMMON ADDITIONAL RESOURCES
INITIAL ASSESSMENT – DETERMINE LIFE-THREATS, PRIORITIZE PATIENT FOR TRANSPORT, ASSESS AND MANAGE AIRWAY, CIRCULATION, BLEEDING
INTUBATE PATIENT WITH C-SPINE CONTROL IF THE PATIENT IS APNEIC
DECOMPRESS TENSION PNEUMOTHORAX/SURGICAL CRICOTHYROTOMY
URGENT PATIENTS
RAPID TRAUMA ASSESSMENT "DCAP-BTLS"
TRANSPORT IMMEDIATELY
CONTACT MED DIRECTION
DURING TRANSPORT
DETAILED ASSESSMENT
MANAGE SPECIFIC INJURIES
ESTABLISH IV/IO SALINE TITRATED TO SYSTOLIC BP > 90 MMHG
NON-URGENT PATIENTS
FOCUSED ASSESSMENT OF INJURED AREA(S) "DCAP-BTLS"
MANAGE INJURED AREA(S)
DETAILED ASSESSMENT
TRANSPORT & CONTACT MEDICAL DIRECTION
CHEST
EVALUATE BREATH SOUNDS
PNEUMO/HEMO THORAX
POSITION ON INJURED SIDE IF POSSIBLE
STABLIZE FLAIL CHEST
ABDOMINAL
EVISCERATION
COVER ORGANS WITH MOIST DRESSING
ELEVATE KNEES
BLUNT INJURY
TREAT HYPOVOLEMIA
IMPALED OBJECT
SECURE OBJECT: DO NOT REMOVE
HEAD
EVALUATE NEURO
GLASGOW
ELEVATE HEAD
PROTECT C-SPINE
HYPER-OXYGENATE IF SIGNS OF HERNIATION ARE PRESENT
EXTREMITY
EVALUATE CIRCULATION & NEURO BEFORE, DURING & AFTER SPLINTING
AMPUTATION
TRANSPORT PART COOL & DRY
CONSIDER ANALGESIA PER LOCAL PROTOCOL OR MEDICAL DIRECTION

GENERAL INFORMATION

A. Resuscitation should not be attempted in cardiac arrest patients with hemicorporectomy, decapitation, or total body burns, nor in patients with obvious, severe blunt trauma who are without vital signs, pupillary response, or an organized or shockable cardiac rhythm at the scene. Patients in cardiac arrest with deep penetrating cranial injuries and patients with penetrating cranial or truncal wounds associated with asystole and a transport time of more than 15 minutes to a definitive care facility are unlikely to benefit from resuscitative efforts.

   Trauma victims who are initially found by EMS professionals in cardiac arrest or found at the scene without vital signs may be considered dead and follow the DOA policy.

B. Extensive, time-consuming care of trauma victims in the field is usually not warranted. Unless the patient is trapped, they should be enroute to a medical facility within 10 minutes after arrival of the ambulance on the scene

EMT

A. Ventilate with 100% oxygen by two-person bag valve mask or oxygen powered, manually triggered or automatic transport ventilation device with an oral or nasal airway

   Ventilation should be delivered over two seconds and cricoid pressure should be considered to help reduce gastric distention

B. Always consider a potential cervical spine injury and provide appropriate spinal care

C. Provide CPR with consideration of cervical spine

D. Transport immediately

AEMT

A. Assist EMS professionals and obtain patient condition and circumstance

B. Establish IV or IO of normal saline and transport to the hospital

C. Check pulse, intubate patient, contact medical direction, and advise of patient condition while continuing CPR

PARAMEDIC

A. Assume charge and confer with EMS professionals as to patient condition and circumstances

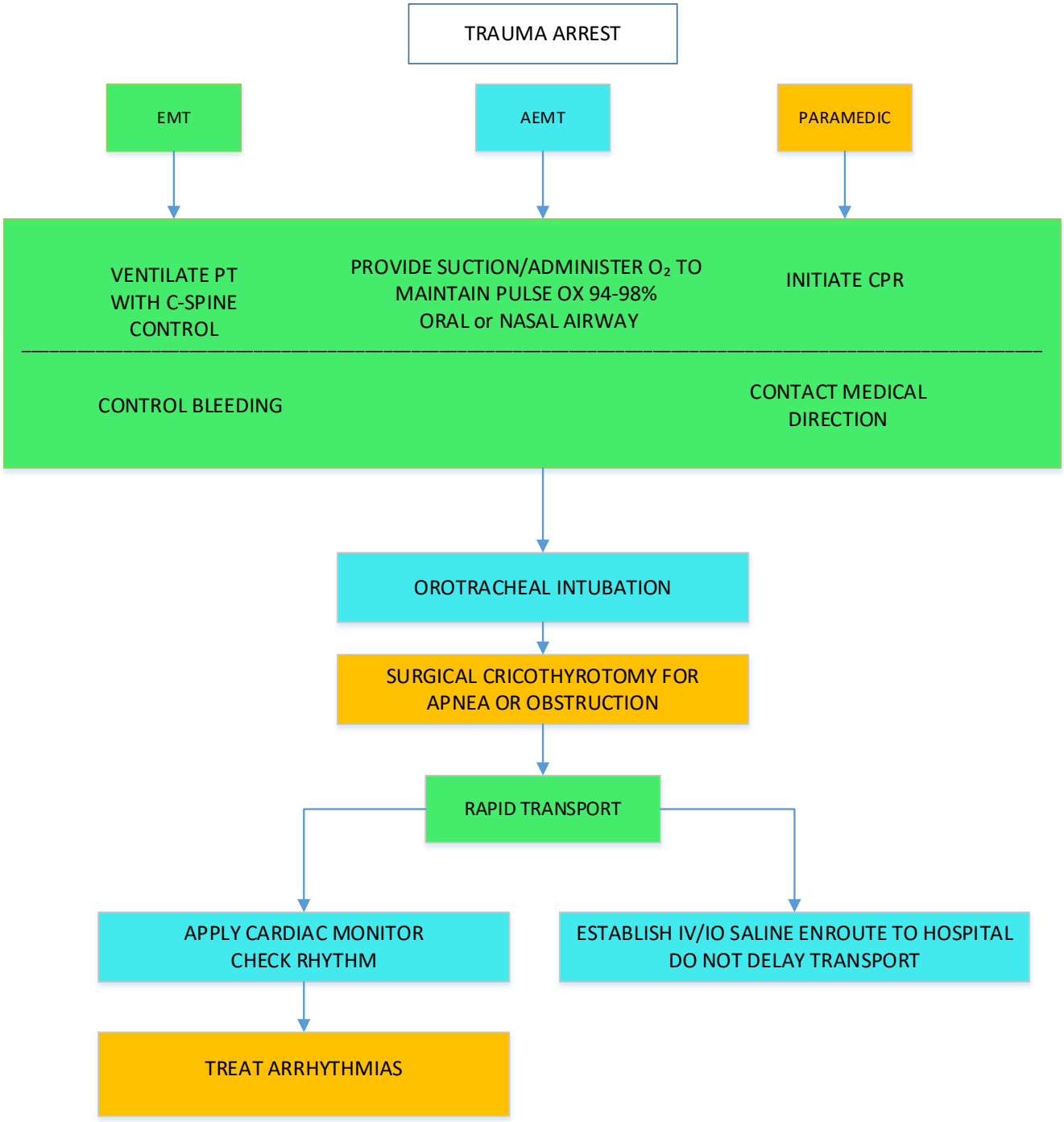
B. Intubate patient:

   1. Patients should be intubated orotracheally without movement of the cervical spine

   2. If orotracheal intubation is not possible, or an obstruction is present, then a cricothyrotomy may be necessary per local protocol.

C. Assess cause of patient's condition and treat according to appropriate guidelines.

D. For penetrating trauma, perform rapid bilateral chest decompression and initiate fluid resuscitation and hemorrhage control. Consider administration of TXA 1 gm IV if available.


TRAUMA ARREST
EMT
AEMT
PARAMEDIC
VENTILATE PT WITH C-SPINE CONTROL
PROVIDE SUCTION/ADMINISTER O_2 TO MAINTAIN PULSE OX 94-98% ORAL or NASAL AIRWAY
INITIATE CPR
CONTROL BLEEDING
CONTACT MEDICAL DIRECTION
OROTRACHEAL INTUBATION
SURGICAL CRICOTHYROTOMY FOR APNEA OR OBSTRUCTION
RAPID TRANSPORT
APPLY CARDIAC MONITOR CHECK RHYTHM
ESTABLISH IV/IO SALINE ENROUTE TO HOSPITAL DO NOT DELAY TRANSPORT
TREAT ARRHYTHMIAS

GLASGOW COMA SCALE

		GCS
EYES	**SPONTANEOUSLY**	**4**
	TO VERBAL COMMAND	**3**
	TO PAIN	**2**
	NO RESPONSE	**1**
BEST MOTOR RESPONSE	**OBEYS VERBAL COMMAND**	**6**
	PURPOSEFUL MOVEMENT TO PAIN	**5**
	FLEXION - WITHDRAWAL	**4**
	FLEXION - ABNORMAL	**3**
	EXTENSION	**2**
	NO RESPONSE	**1**
BEST VERBAL RESPONSE	**ORIENTED & CONVERSES**	**5**
	DISORIENTED & CONVERSES	**4**
	INAPPROPRIATE WORDS	**3**
	INCOMPREHENSIBLE SOUNDS	**2**
	NO RESPONSE	**1**

REVISED TRAUMA SCORE

		RTS
GLASGOW COMA SCALE	**13 - 15**	**4**
	9 - 12	**3**
	6 - 8	**2**
	4 - 5	**1**
	0 - 3	**0**
RESPIRATORY RATE	**10 - 29**	**4**
	LESS THAN 29	**3**
	6 - 9	**2**
	1 - 5	**1**
	0	**0**
SYSTOLIC BLOOD PRESSURE	**LESS THAN 89**	**4**
	76 - 89	**3**
	50 - 75	**2**
	1 - 49	**1**
	0	**0**

ABUSE AND MALTREATMENT

Abuse and/or maltreatment is any act or series of acts of commission or omission by a caregiver or person in a position of power over the patient that results in harm, potential for harm, or threat of harm to a patient. Abuse and maltreatment occurs in all age groups, including vulnerable and less vulnerable populations. Unlike the emergency department staff, EMS professionals are in a unique position to witness and identify abnormalities or environmental risks in the patient's residence as well as unusual initial interactions between the patient and their caregiver, family members, or other bystanders.

Types of Abuse or Maltreatment

Abandonment
Emotional
Financial (particularly in geriatric population)
Human trafficking: Abduction or coercion into service (at times across international borders)
Neglect
Physical
Sexual

NOTE: According to the U.S. Department of Homeland Security, human trafficking is the second fastest growing criminal industry in our nation with drug trafficking currently maintaining the lead.

Physical Clues on Patient Assessment

A. Multiple bruises in various stages of healing
B. Age-inappropriate behavior (e.g. adults who are submissive or fearful, children who act in a sexually inappropriate way)
C. Pattern burns, bruises, or scars suggestive of specific weaponry used
D. Evidence of medical neglect for injuries or infections
E. Unexplained trauma to genitourinary systems or frequent infections to this system
F. Evidence of malnourishment and/or serious dental problems
G. Injuries not appropriate for patient's age or physical abilities (e.g. infants with injuries usually associated with ambulatory children, elders who have limited mobility with injury mechanisms inconsistent with their capabilities)
H. Tattoos and/or branding is common in victims of human trafficking as they are placed by the trafficker as a label of ownership. While some traffickers use their initials or a specific design in a tattoo, there has been a trend to use barcode-like tattoos. In addition to the chest, neck, or extremities, traffickers will also use less visible sites, such as the inferior surface of the victim's tongue, to place a tattoo symbolizing ownership.

Clues Arising from the Caregiver

A. Apathy about patient's current situation
B. Overreaction to questions about situation
C. Inconsistent histories from caregivers or bystanders regarding what happened
D. Information provided by caregivers or patient that is not consistent with injury patterns
E. Caregiver not allowing adult patient to speak for themselves, or who appears controlling

Environment Clues

A. Inadequate safety precautions or facilities where the patient lives
B. A state of squalor in the residence
C. Evidence of security measures that appear to confine the patient inappropriately (e.g. interior doors with padlocks or missing doorknobs, boards or other obstructive objects over intact windows)

Reporting Abuse and Maltreatment

A. It is imperative for EMS professionals to communicate and document all information to the emergency department and/or receiving facility's staff including, but not limited to, the patient's physical findings and emotional condition, the caregiver's demeanor and interactions, and the condition and abnormal findings of the environment noted while on scene
B. Reporting of suspected or confirmed child abuse and/or maltreatment is mandatory by Ohio law and provides civil immunity to the individual who files the report
C. Currently, there is no immunity provided for reporting suspected or confirmed abuse and/or maltreatment of adults; however, it is highly unlikely to be sued successfully for initiating an investigation unless it is an act of willful or wanton misconduct by the reporter
D. Adult Protective Services and Child Protective Services are excellent resources to initiate a report of suspected or confirmed abuse and/or maltreatment particularly in cases where patient transport is ultimately refused. A request placed to the EMS medical director to acquire social services consultation for the patient is another option.
E. Law enforcement agencies are also excellent resources to initiate a report of suspected or confirmed abuse and/or maltreatment particularly when it involves human trafficking or financial, physical or sexual abuse

Additional Facts

A. Child Abuse and Maltreatment:
   1. The estimated incidence of child maltreatment is approximately 9-10 per 1000 children
   2. The highest rate of victimization occurs in children younger than 1 year of age (24%).
   3. Approximately 80% of the perpetrators are the child's parents
   4. The estimated fatality rate for pediatric victims of maltreatment is 2-3 per 100,000 children.

B. Elder Abuse and Maltreatment:
   1. Approximately 90% of elder abusers are family members with higher rates occurring in care providers who feel burdened by their caregiving responsibilities, have psychiatric illness, or abuse drugs or alcohol
   2. Patients with dementia are at the greatest risk of abuse with approximately 50% having experienced maltreatment by their caregivers

C. Human Trafficking:
   1. The second fastest growing criminal industry in the United States
   2. Emergency departments are the primary source of medical care for victims as it facilitates the avoidance of detection and tracking
   3. Victims rarely presents a government-issued form of identification
   4. The trafficker often presents himself/herself as the victim's relative (e.g. sibling) or spouse to provide a more viable reason to remain with the victim during patient transport or during the course of medical care
   5. When accessing the healthcare system or entering a healthcare facility alone, the victim will often desire or demand a brief and/or accelerated evaluation or to be discharged after a brief period of time due to threats from the trafficker if time limits are exceeded or if the trafficker is monitoring the victim from a remote location

A. Air medical services may be requested directly to the scene by:

1. An on-scene EMS organization

2. Hospitals and healthcare facilities

B. A request for an air medical service response may be initiated when one or more of the following conditions exists:

1. The patient's airway, breathing, or hemorrhage/circulation cannot be controlled by conventional means and the estimated arrival time of the air medical service is less than the time required for ground transport to the nearest hospital

2. Air transport of a patient with a time-critical diagnosis to a medical facility with the most appropriate resources (e.g. a trauma patient to a designated trauma center) will occur in a shorter time than ground transport to a medical facility with the most appropriate resources

NOTE: The estimation of transport time should be made from the time the patient is ready for transport to the arrival at the medical facility with the most appropriate resources and should include the response time of the aircraft to the scene

C. The decision-making process for the destination of patient transported by an air medical service is critical and should be based upon maximizing patient outcome and safety. A medical facility with the most appropriate resources is based upon, but not limited to, the following factors:

1. Time to definitive care

2. Capabilities of the receiving medical facility

3. Legislative requirement (e.g. designated trauma centers for trauma patients)

4. Patient's wishes

5. Family continuity

A member of the EMS team must contact medical direction at the earliest time to maximize quality patient care delivery. Whether it originates from the EMS professional or the emergency medical dispatcher, a brief early notification while enroute or from the scene prior to acquisition of all of the patient information provides additional time for the receiving facility to prepare to receive a patient.

The hospital can also be contacted from the scene if assistance is needed in the patient's immediate care or permission is required for part of the patient care deemed necessary by the EMS professional in charge.

When possible, the member of the team most knowledgeable about the patient should be the one calling in the report.

Although all EMS professionals have been trained to give a full, complete report, this is not always necessary, and excessively verbose reports may interfere incoming calls from other EMS units. Reports should be as complete, focused, and concise as possible to allow the physician to understand the patient's condition. Frequently, the physician may ask questions after the report is given.

If multiple victims are present on the scene, it is advisable to contact medical direction with a preliminary report. This should be an overview of the scene, including the estimated number of victims, seriousness of the injuries, and the estimated on-scene and transport times to the closest appropriate hospital or possible other nearby facilities. This allows preparation for receiving the victims and facilitates good patient care.

When contacting the receiving facility or medical direction, the patient report it should begin with the identification of the squad calling, and the highest level of care which is able to be provided to the patient (i.e., EMT, AEMT, or Paramedic), and the nature of the call (the physician or nurse to whom you need to speak directly).

Triage of Patient Reports

EMS systems may elect to adopt a classification matrix for communications and/or patient reports that is based upon patient clinical impression, condition, or acuity to facilitate the triage of patient reports. This classification system can be helpful to the receiving facility in the preparation to care for the patient. It is also helpful for the personnel receiving the run reports during the process of triaging multiple incoming patient reports.

The State of Ohio does not have a mandatory system for the triage of patient reports, and the State Board of Emergency Medical, Fire, and Transportation Services has not recommended any specific method. If implemented, a patient report system must take in to consideration the certification level and depth of manpower in the local EMS agencies, the healthcare resources available in or near the jurisdiction, the emergency medical dispatch system, tiered patient triage system is implemented, and the expectations, demographics, and transportation resources of the community. Due to the inherent liability risks, legal counsel should be engaged in the development and implementation process to ensure that all parties, particularly the patients, are adequately protected and served, and to ensure that sufficient administrative, operational, and malpractice insurance policies are appropriately secured for the participating emergency response organizations. .

DEAD ON ARRIVAL

GENERAL STATEMENT

By law, EMS professionals, with the exception of emergency medical responders (EMRs) are classified as competent observers as cited in Ohio Administrative Code 4731-14. While the pronouncement of death must be done by a licensed physician or the specific medical professionals listed in Ohio Administrative Code 4731-14-01, competent observers are only authorized to determine death.

When a patient is encountered who appears to be dead on arrival (DOA), the EMS professional should avoid disturbing the scene or the body as much as possible, unless it is necessary to do so in order to care for and assist other patients. Once it is determined that the patient is, in fact, dead, the EMS professionals should move as rapidly as possible to transfer responsibility or management of the scene to law enforcement personnel and/or the coroner's office. It is the EMS professional's responsibility to notify the coroner's office directly or to ensure that the coroner's office has been notified by a law enforcement officer on the scene.

The determination that a patient is dead rests with the EMS professionals. Any of the following may be used as guidelines to support the determination that a patient is deceased:

A. An injury which is incompatible with life (i.e., decapitated, or burned beyond recognition)

B. Cardiac arrest secondary to massive blunt trauma without signs of exsanguinating hemorrhage (i.e. limb amputation)

C. Signs of decomposition, rigor mortis, or dependent lividity

D. If the patient is an adult with an unwitnessed cardiac arrest, has a history of an absence of vital signs for greater than 20 minutes, and is found in asystole not secondary to hypothermia or cold water drowning

E. If there are valid DNR (Do Not Resuscitate) orders, see DNR guidelines

F. If a patient has a history of terminal disease, the family refuses resuscitation and permission to honor the wishes of the family or legal guardian has been given by medical direction

<u>CAUTION:</u> IF ANY DOUBT EXISTS THAT THE VICTIM IS DEAD AT THE TIME OF ARRIVAL OF THE SQUAD, RESUSCITATIVE MEASURES SHOULD BE INSTITUTED IMMEDIATELY. WHENEVER RESUSCITATIVE MEASURES ARE INSTITUTED, THEY MUST BE CONTINUED UNTIL ARRIVAL AT A HOSPITAL OR UNTIL A PHYSICIAN HAS ORDERED THE DISCONTINUATION OF RESUSCITATIVE EFFORTS, PRONOUNCED THE PATIENT DEAD, OR A VALID DNR IS PROVIDED.

OHIO DO NOT RESUSCITATE (DNR) COMFORT CARE

BACKGROUND

In 1999, the Ohio Department of Health successfully established a Do-Not-Resuscitate Comfort Care (DNR Comfort Care) Protocol within the Ohio Revised Code. In the past, do-not-resuscitate (DNR) orders could not be honored without contacting medical direction when EMS or the 911 system was activated. The DNR Comfort Care Protocol will permit EMS to honor DNR orders without immediately contacting medical direction and provides guidelines for the prehospital management of these patients.

A DNR Comfort Care patient has completed a living will or has been issued a DNR order. The DNR Comfort Care protocol can be performed immediately by EMS for these patients. There is a subset of patients who are DNR Comfort Care-Arrest patients. This protocol is to be activated only in the event or a cardiac or respiratory arrest for these patients. EMS should follow the State of Ohio EMS Guidelines for these cases unless they present as a cardiac or respiratory arrest. In the event of a cardiac or respiratory arrest in a DNR Comfort Care-Arrest patient, the patient care should then be diverted to the DNR Comfort Care Protocol. For the purposes of this protocol, a cardiac arrest is defined as the loss of discernible audible and palpable pulse, with or without the loss of cardiac action/rhythm if on a cardiac monitor, or the sudden abrupt loss of heart function, and a respiratory arrest is defined as the absence of spontaneous respirations or presence of agonal respirations. The patient's DNR order or DNR identification should be checked very carefully to distinguish between the DNR Comfort Care and the DNR Comfort Care-Arrest classifications.

A DNR Comfort Care designation does not imply that the patient does not want to be treated for illnesses or injuries unrelated to a terminal disease process. For example, if the patient sustained a bee sting and was developing anaphylaxis, EMS providers should follow the anaphylaxis protocol. Medical direction should be contacted as soon as possible for further guidance and potential temporary revocation of the DNR Comfort Care order.

A reasonable effort should be made to positively identify the patient with DNR orders, but it is not required for the performance of this protocol. Patients of health care facilities do not require verification of identity when the DNR order is present on the patient chart. Acceptable methods of patient identification verification include a driver's license, passport, picture ID, institution identification band, or personal identification by a family member, caregiver, friend, or health care worker.

A patient's DNR Comfort Care or DNR Comfort Care-Arrest status can be confirmed by one of the following:

1. A DNR Comfort Care card or form completed for the patient.
2. A completed State of Ohio living will (declaration) form that states that the patient does not want CPR (in the case of a patient who has been determined by two doctors to be in a terminal or permanently unconscious state).
3. A DNR Comfort Care necklace or bracelet bearing the DNR Comfort Care official logo.

4. A DNR order signed by a physician, advanced practice registered nurse, (APRN), or physician assistant (PA).
5. A verbal DNR order is issued by the patient's attending physician, advanced practice registered nurse (APRN), or physician assistant (PA).

EMS providers are not required to search a patient to locate DNR identification. Copies of the documents listed under items 1, 2, or 4 are sufficient. The EMS provider must verify the identity of a physician, advanced practice registered nurse, or physician issuing a verbal DNR order. Acceptable methods of verification include personal knowledge of the physician, APRN or PA, a return telephone call to verify the information provided, or a list of practitioners with other identifying information such as addresses.

A DNR Comfort Care order is considered current if it is present in a health care facility's records or patient chart. A DNR Comfort Care order for a patient outside of a health care facility is considered current unless it is revoked by the patient or by the patient's attending physician or authorized healthcare provider of the person with the DNR Comfort Care order. EMS providers are not required to research whether a DNR Comfort Care order that appears to be current has been discontinued.

The DNR Comfort Care patient always retains the right to request resuscitation even if the protocol has been activated. A request for resuscitation by the patient revokes the DNR Comfort Care status and the EMS providers should immediately follow the resuscitation procedures in the State of Ohio EMS Guidelines.

Once the DNR Comfort Care protocol has been activated, the wishes of family members or bystanders demanding or requesting resuscitation should not be honored. Any and all resuscitative measures should continue to be withheld. Attempts should be made to help the family understand the dying process and the patient's choice not to be resuscitated.

When the DNR Comfort Care Protocol has been activated, EMS personnel will provide the following care as clinically indicated:

1. Conduct an initial assessment
2. Perform basic medical care
3. Clear airway of obstruction or suction
4. If necessary for comfort or to relieve distress, may administer oxygen, CPAP, or BiPAP
5. If necessary, may obtain IV access for hydration or pain medication to relieve discomfort, but not to prolong death
6. If possible, may contact other appropriate health care providers (e.g., hospice, home health, physician, APRN, or PA)

When the DNR Comfort Care Protocol has been activated, EMS personnel will not perform the following:

1. Perform CPR
2. Administer resuscitation medications with the intent of restarting the heart or breathing
3. Insert an airway adjunct
4. Defibrillate, cardiovert, or initiate pacing
5. Initiate continuous cardiac monitoring.

NOTE: If you have responded to an emergency situation by initiating any of the "will not" actions prior to confirming that the DNR Comfort Care Protocol must be activated, discontinue them when you activate the protocol. You may continue respiratory assistance, IV medications, etc., that have been part of the patient's ongoing course of treatment for an underlying disease.

If family or bystanders request or demand resuscitation for a person for whom the DNR Comfort Care Protocol has been activated, do not proceed with resuscitation. Provide comfort measures as outlined above and try to help the family members understand the dying process and the patient's choice not to be resuscitated.

When the DNR Comfort Care protocol is performed, the suggested documentation on the patient care report should include the following information:

1. The document identifying the DNR Comfort Care status of the patient.
2. The method of verification of the patient's identity, if any was found through reasonable efforts.
3. DNR Comfort Care or DNR Comfort Care-Arrest classification.
4. All actions taken to implement the DNR Comfort Care protocol.
5. Any and all unusual events occurring enroute or on scene including interactions with family members, bystanders, or health care providers.

Any and all questions or concerns that arise during the management of DNR Comfort Care patients may be directed to and discussed with medical direction for assistance and guidance.

PALLIATIVE/END-OF-LIFE CARE

While the Ohio Do Not Resuscitate Comfort Care program has a specific patient care protocol that must be followed, there are many other forms of advance directives, e.g., living wills, hospice contracts, that a patient can select to guide their end-of-life care. A patient may elect to decline specific interventions or services. If hospice contract is in place, a patient or their caregiver may be provided with medications that can be administered to provide comfort of symptom relief.

Palliative care does not mean that the patient should not receive treatment.

1. Obtain vital signs

2. If dyspneic, provide oxygen at a rate and/or in a manner, e.g., CPAP, that relieves the patient's symptoms rather than titrating to a pulse ox of 94-98%

3. Provide pain relief as clinically indicated. Opiates are the most effective analgesic for end-of-life pain.

4. Follow the local EMS protocols and contact medical direction for additional guidance

The patient may have a hospice kit that contains medications for pain, anxiety, agitation, nausea, and other symptoms. While the EMS provider must follow the local EMS protocol and orders provided by medical direction, any medications from the hospice kit that are self-administered by the patient or administered to the patient by the hospice nurse or caregiver should be documented on the patient care run report and communicated to the receiving healthcare facility upon arrival.

The patient retains the right to revoke an advance directive, including a hospice contract, at any time. Unlike the Ohio DNR Comfort Care program, the patient's power of attorney, power of attorney for healthcare, legal guardian, or family member can revoke the patient's advance directive and request or decline specific interventions or services. In this scenario, it is always advisable to contact medical direction for guidance and to notify the receiving healthcare facility upon arrival.

GENERAL STATEMENT

Competency is a legal definition that is determined by a court of law. EMS professionals may, through patient assessment, determine a patient's mental capacity for decision-making. For the purpose of this discussion, clinical competency refers to the mental capacity to make medical decisions and not to the legal definition of competency.

Clinically competent adult patients have the right to give consent for, or refuse, any or all treatments. EMS professionals should attempt to obtain vital signs on all patients. Clinically competent adult patients also have the right to give consent for, or refuse ambulance transport. Each agency should have established guidelines for patient consent and refusal. A performance improvement (PI) process should be in place to review these patient care interactions.

A. Consent

1. When waiting to obtain lawful consent from the person authorized to make such consent would present a serious risk of death, serious impairment of health, or would prolong severe pain or suffering of the patient, treatment may be undertaken to avoid those risks without consent. In no event should legal consent procedures be allowed to delay immediately required treatment.

2. A clinically competent adult patient may withdraw consent for treatment at any time. Prior to the discontinuation or withdrawal of treatment, EMS professionals should determine if the patient is clinically competent.

B. Clinical competence – Decision-making capacity

1. A person is clinically competent if the person:
    a. Is capable of understanding the nature and consequences of the proposed treatment
    b. Has sufficient emotional control, judgment, and discretion to manage his or her own affairs

2. Ascertaining that the patient has an understanding of what happened and may potentially happen if treated or not treated, and a plan of action (e.g. secure a mode of transportation home) should be adequate to facilitate making these determinations.

C. Impairment – Patient may be considered clinically incompetent to refuse care and/or transport when they appear impaired to the degree that negatively impacts the mental capacity for decision-making. Factors that may cause a patient to be impaired include, but are not limited to:

1. Suicidal ideation

2. Alcohol intoxication

3. Illicit drugs

4. Prescription and non-prescription drugs

5. Medical conditions
    a. Hypoglycemia
    b. Hypoxemia
    c. Hypoperfusion
    d. Head trauma
    e. Psychiatric conditions

D. Pediatric patients

1. A critically ill or injured child should be treated and transported immediately

2. In non-emergency cases involving minors, consent should be obtained from the parent or legal guardian prior to undertaking any treatment. All children must be evaluated for acuity of illness, regardless of obtaining parental consent.

3. Each agency should have policies which delineate situations in which children may be left at the scene, emancipated status, and instances when medical direction should be contacted.

PROCEDURE FOR REFUSAL

A. Patient refusals, altered transport criteria for patients deemed to be of lower acuity, and non-transports may inherently place the patient at risk and may expose the EMS provider and EMS agency to medicolegal risk and/or liability. **All protocols and documentation tools regarding patient refusals, altered transport criteria for patient deemed to be of lower acuity, and non-transports should be thoroughly reviewed by the legal counsel of the EMS agency and the EMS medical director prior to implementation. Community engagement and education is highly suggested to improve the alignment between patient expectations and the parameters in the patient transport and non-transport protocols.**

B. If a patient wishes to refuse treatment, examination or transportation, each agency should have steps which will be followed and optimally all of these runs will be reviewed as part of the performance improvement/quality assurance process.

C. The completion of a Patient Refusal Checklist by the EMS professional is suggested (see enclosed example).

1. The patient must be advised of the benefits of treatment and transport as well as the specific risks of refusal of treatment and transport.

2. The patient must be able to relate to the EMS professional in his or her own words what the risks and benefits of refusal of transport.

3. The patient will be provided with a refusal information sheet, also attached. A copy of this refusal information sheet or the refusal section of the check list will be signed by the patient, dated, and both will be kept with the patient's file.

SAMPLE OF AN EMS PATIENT REFUSAL CHECKLIST

1. ASSESSMENT OF PATIENT (CIRCLE APPROPRIATE RESPONSE)

ALCOHOL / DRUGS INGESTION PER HISTORY OR EXAM	Y	/	N
ALTERED LEVEL OF CONSCIOUSNESS	Y	/	N
HEAD INJURY	Y	/	N

ORIENTED TO: PERSON PLACE TIME SITUATION

2. MEDICAL DIRECTION

CONTACTED VIA: PHONE RADIO TIME _____
UNABLE TO CONTACT ( ) MEDICAL DIRECTION PHYSICIAN _____

If medical direction not able to be contacted, explain in comment section of checklist
ORDERS:

( ) INDICATED TREATMENT / TRANSPORT MAY BE REFUSED BY PATIENT
( ) USE REASONABLE FORCE / RESTRAINT TO PROVIDE TREATMENT
( ) USE REASONABLE FORCE AND / OR RESTRAINT TO TRANSPORT

OTHER _____

3. PATIENT ADVISED (CIRCLE APPROPRIATE RESPONSE)

*	MEDICAL TREATMENT / EVALUATION NEEDED	Y	/	N
*	AMBULANCE TRANSPORT NEEDED	Y	/	N
*	FURTHER HARM MAY RESULT WITHOUT MEDICAL TREATMENT OR EVALUATION	Y	/	N
*	TRANSPORT BY MEANS OTHER THAN AMBULANCE COULD BE HAZARDOUS IN LIGHT OF THE PATIENT'S PRESENT ILLNESS OR INJURY	Y	/	N
*	PATIENT PROVIDED WITH REFUSAL ADVICE SHEET	Y	/	N
*	PATIENT WOULD NOT ACCEPT REFUSAL SHEET	Y	/	N

4. DISPOSITION

( ) REFUSED ALL EMS SERVICES
( ) REFUSED TRANSPORT, ACCEPTED FIELD TREATMENT
( ) REFUSED FIELD TREATMENT, ACCEPTED TRANSPORT
( ) RELEASED IN CARE OR CUSTODY OF SELF
( ) RELEASED IN CUSTODY OF LAW ENFORCEMENT AGENCY
AGENCY _____
OFFICER _____
( ) RELEASED IN CARE OR CUSTODY OF RELATIVE OR FRIEND
NAME _____
RELATION _____

5. COMMENTS

_____
_____
_____
_____

EMS PROFESSIONAL_____ DATE _____ TIME _____

OFFICER _____ DATE _____ TIME _____

SAMPLE OF A REFUSAL INFORMATION SHEET

PLEASE READ AND KEEP THIS FORM

This form has been given to you because you have refused treatment and/or transport by the Emergency Medical Service (EMS). Your health and safety are our primary concern, so even though you have decided not to accept our advice, please remember the following:

1. The evaluation and/or treatment provided to you by EMS professionals is not a substitute for medical evaluation and treatment by a doctor. We advise you to get medical evaluation and treatment.

2. Your condition may not seem as bad to you as it actually is. Without treatment your condition or problem could become worse. If you are planning to get medical treatment, a decision to refuse treatment or transport by the EMS may result in a delay which could make your condition or problem worse.

3. Medical evaluation and/or treatment may be obtained by calling your doctor, if you have one, or by going to any hospital emergency department in this area, all of which are staffed 24 hours a day by emergency physicians. You may be seen at these emergency departments without an appointment.

4. If you change your mind or your condition becomes worse and you decide to accept treatment and transport by the Emergency Medical Service, please do not hesitate to call us back. We will do our best to help you.

5. [ ] **If the box at the left has been checked,** it means that your problem or condition has been discussed with an emergency physician at the medical direction hospital by radio or telephone, and the advise given to you by the Emergency Medical Service has been issued or approved by the emergency physician.

*** I have been informed of the dangers of my not being treated and/or transported by the Emergency Medical Services, for my condition, for treatment by an emergency department or private physician. I release _____ and consulting hospital their employees and officers from all liability for any adverse results caused by my decision.

I have received a copy of this information sheet.

Signature:

_____

Circle one: Patient Spouse Parent Guardian

Print Name:

_____

Signature of EMS professional: _____Witness: _____

Print Name: _____ _____

Report Number: _____ Date: _____

SAMPLE OF A PATIENT NON-TRANSPORT POLICY

A number of EMS calls result in non-transport of the patient or victim. If an individual is not transported by the squad, the following guidelines will apply:

1. In the event of a patient assist call and no emergency medical services are rendered, a report should be made; however, medical direction does not need to be contacted.

2. If the patient refuses treatment or transport, the patient refusal procedure should be followed.

3. If the patient is requesting transport and the EMS professionals in charge does not feel it is necessary to transport the patient, medical direction must be contacted for approval of the EMS non-transport. This includes any case that might be transported by car or private ambulance. It is advisable to compete an approved form of documentation (See the sample of a non-transport advisory form) and provide it to the patient.

4. Non-transport for minors: If after evaluation of a minor, the EMS professional and medical control agree that the patient has a minimal illness or injury or voices no complaints, that minor can be left in the care of a responsible adult that is not the parent or legal guardian. The responsible adult may be a family friend, neighbor, school bus driver, teacher, school official, police officer, social worker, or other person at the discretion of medical control and the EMS professional.

A SAMPLE OF A NON-TRANSPORT ADVISORY FORM

You have been evaluated by an EMS professional in communication with a physician over a radio. It has been determined that you do not need an ambulance at this time. THIS DOES NOT MEAN THAT YOU SHOULD NOT BE SEEN BY A PHYSICIAN. THE EVALUATION AND TREATMENT YOU RECEIVED WAS TO DETERMINE THE SEVERITY OF YOUR PROBLEM AND WHETHER OR NOT YOU NEEDED AN AMBULANCE; IT IS NOT A SUBSTITUTE FOR FINAL EVALUATION AND TREATMENT BY A PHYSICIAN.

We advise you to see a physician at this time. You may decide that you don't need to see a physician now; however, if you don't, then you must take the risk that you will not receive the treatment that you need and that this may cause problems for you later on. The following may help you decide:

1. If you have a cut, only a physician should decide whether or not you need stitches. Most physicians recommend stitches within 6 hours because after that the risk of an infection becomes much greater.

2. If you have a cut, scrape or burn and have not had a tetanus (lockjaw) shot within 5 years, you may need one. You do not need to get a tetanus shot immediately, but you should not delay obtaining one for more than 24 hours.

3. Many burns do not appear to be as bad as they really are. Also, serious problems can develop from some burns which may be prevented by early medical treatment.

4. If the pain or other discomfort you had has gone away, it does not necessarily mean the problem that caused it has gone away.

5. If you decide you don't need to see a physician and then change your mind, don't wait. The longer you wait, the more problems you may have.

USE COMMON SENSE!!!

"IF I DON'T HAVE A PHYSICIAN, OR CAN'T SEE MY PHYSICIAN NOW, WHAT CAN I DO?"

GO TO THE NEAREST EMERGENCY DEPARTMENT OR CALL BACK EMERGENCY MEDICAL SERVICES.

Patient Signature _____ Date _____

EMS Provider's Signature_____

Report # _____

HEAVY PATIENTS

GENERAL CONSIDERATIONS

Less than one percent of the population has a weight in excess of 300 pounds. This means that in any community there may be one or more individuals who fall into this category. As patients, these individuals are frequently classed as high risk because of the increased medical complications associated with their excess weight. Within the EMS system, they present the additional problem of movement and transportation. These individuals have the right to expect prompt and expert emergency medical care. Therefore, in order to facilitate the care of these individuals without risking the health of EMS professionals, the following guideline has been established.

A. In managing a patient who weighs over 300 pounds, the patient be moved with at least 6 individuals to assist and/or with a bariatric stretcher. At the scene, as many EMS professionals as can be mobilized may be supplemented by police or other safety personnel as appropriate. If 6 individuals or bariatric transport equipment are not available, mutual aid will be required.

B. It may be necessary to remove doors, walls or windows. The situation is no different than extrication from a vehicle although the resultant property damage may be higher. At all times, the patient's life must be the first priority.

C. The patient is to be placed on at least 2 (double) backboards or other adequate transfer device for support.

D. The patient is to be loaded on a cot that is in the down position, and the cot is to be kept in the down position at all times.

E. Three (3) EMS professionals are to accompany the patient during transport. If additional personnel are available they are to travel in a separate vehicle.

F. The patient will be loaded directly from the squad onto a special hospital bed designed especially with the specifications for a bariatric patient that will, ideally, be brought to the emergency department entrance.

G. It is necessary to notify the hospital well in advance of arrival so that preparations to accept the patient and to protect the safety of all parties involved in this process can be completed in a timely fashion.

H. If individuals in the community are known to fall within this special category of functional need, it is appropriate to inform them in advance of the type of assistance they can expect from the EMS system, and help them make plans well in advance to assist you. When calling for the squad, and if they identify themselves and their special needs, it will promote the timeliness of your efforts and be beneficial to all parties involved.

PATIENTS WITH FUNCTIONAL NEEDS

In 1980, the World Health Organization created a classification called the International Classification of Impairments, Disabilities, and Handicaps (ICHDH) to identify populations with health components of special needs and/or disability. The list of conditions cited under this classification has been expanded several times over the years and remains in a fluid state. In 2001, the World Health Assembly amended the title of this classification to the International Classification of Functioning, Disability, and Health (ICF), and over time, the term "special needs" has been replaced with "functional needs". In the United States, the Americans with Disabilities Act of 1990 (ADA) was the initial broad civil rights law to address individuals with disabilities. Many states, including Ohio, passed similar legislation to support individuals with disabilities and patients with functional needs. Per the ADA, disability is defined as "a physical or mental impairment that substantially limits a major life activity".

EMS professionals must be cognizant of the protocols provided by the EMS medical director for the prehospital management of functional needs patients as well as the existing state and federal legislation. Most importantly, the quality of medical care should not intentionally be diminished or adversely altered during the triage, treatment, and transport of functional needs patients. Although your EMS medical director may provide additional parameters and protocols, the following provides a basic overview of the patient management scenarios most frequently seen by EMS professionals.

Communication Barriers

Language Barriers: EMS professionals may accept the assistance of family members or bystanders during communication with a patient who has expressive and/or receptive aphasia, is nonverbal, or who speaks a different language than the EMS professional. Documentation of the identification of the person assisting with the communication and, if possible, transport of this individual to the hospital with the patient is advised. For differences in language, there are a number of products on the market (translation cards, symbols, telephone-accessible services with live interpreters, etc.) specifically created for the medical environment to assist EMS professional in obtaining a patient's chief complaint, medical history, medication, allergies, and other critical information. The methods through which the patient augments their communication skills (eye blinking, nodding, etc.) should be noted and communicated to the receiving facility.

Sensory Barriers: Sensory barriers, i.e. visual or auditory impairment, may present challenges in the prehospital setting, particularly during the acquisition of a patient history and the completion of patient assessment. The methods through which the patient augments their communication skills (use of Braille, sign language, lip reading, etc.) should be noted and communicated to the receiving facility. Written communication between the patient and the EMS professional is part of the medical record, even if it is on a scrap sheet of paper, and it should be retained with the same collation, storage, and confidentiality policies and procedures that are applicable to the written or electronic patient care report.

Assistance Adjuncts

Assistance devices: The devices that facilitate the activities of life for the patient with functional needs should be noted. These devices include, but are not limited to, magnifiers, white or sensory canes, hearing aids, tracheostomy speaking valves, or extremity prostheses. These devices should accompany the patient if possible during transport as their availability to the patient can facilitate the interaction between the patient and the healthcare provider and enhance the patient's safety and overall well-being.

Service Animals: A service animal, usually a dog, is not classified as a pet and should, by law, always be permitted to accompany the patient. A service animal as defined by the ADA is "any guide dog, signal dog, or other animal individually trained to do work or perform tasks for the benefit of an individual with a disability, including, but not limited to guiding individuals with impaired vision, alerting individuals with impaired hearing to intruders or sounds, providing minimal protection or rescue work, pulling a wheelchair, or fetching dropped items." The service animal is not required to wear a vest or a leash, and it is illegal to make a request for special identification or documentation from the service animal's partner. EMS professionals may only ask the patient if the service animal is required because of a disability and the form of assistance the animal has been trained to perform. EMS professionals are not responsible for the care of service animals. If the patient is incapacitated and cannot personally care for the service animal, a decision can be made whether or not to transport the animal in this situation. Animals that provide emotional support, comfort, or companionship do not quality as service animals.

ON-SCENE EMS INTERVENER

During an EMS run where an unknown EMS professional from outside the responding EMS agency wishes to intervene in the care of patients, the following steps should be initiated:

1. Ideally, if no further assistance is needed, the offer should be declined.

2. If the EMS intervener's assistance is needed or may contribute to the care of the patient:

    a. An attempt should be made to obtain proper identification and confirm the possession of a valid Ohio EMS certificate. Acceptance of borderline states' EMS certification or licensure documents is at the discretion of the EMS medical director and/or individual EMS agency. It is highly advisable to document the EMS intervener's name, address and certification numbers on the run report.

3. Significant involvement with patient care or variance from the local protocols will require the EMS intervener to accompany the patient to the hospital.

PHYSICIAN IN THE OUT-OF-HOSPITAL SETTING

This is a physician with no previous relationship to the patient and is not the patient's private physician, but is offering assistance in caring for the patient. The following criteria must be met for this physician to assume any responsibility for the care of the patient:

1. Medical direction must be informed and give approval.

2. The physician must have proof they are a physician. The physician should be able to present their medical license, an actual or replica physician wallet card, or undergo confirmation of licensure electronically through the associated state medical board's website. Ideally, the presentation of documentation of medical licensure should be paired with the presentation of a government-issued form of photo identification. It is highly advisable to document the physician's name, address, and medical license number on the run report.

3. The physician must be willing to assume responsibility for the patient until relieved by another physician, usually at the emergency department.

4. The physician must not require the EMS professional to perform any procedures or institute any treatment that would vary from the protocol and/or procedures outlined in the protocols provided by the medical director of the EMS agency or that are not within the Ohio EMS scope of practice.

If the physician is not willing or able to comply with all the above requirements, his assistance must be courteously declined.

PHYSICIAN IN HIS/HER OFFICE OR AN URGENT CARE CENTER

1. EMS should perform their duties as usual under the supervision of medical direction or by local protocol.

2. The physician may elect to treat the patient in his office.

3. The EMS professional should not provide any treatment under the physician's direction that varies from the protocols provided by the medical director of the EMS agency or is not within the Ohio EMS scope of practice. If asked to exceed these boundaries, the EMS professional should decline the request until contact is made with medical direction.

4. Once the patient has been transferred into the transport vehicle, the patient's care becomes entirely under medical direction.

GENERAL GUIDELINES

A. Soft physical management devices are to be used only when necessary in situations where the patient is potentially violent and may be of danger to themselves or others. Patients who are clinically competent retain a right to refuse transport. EMS professionals must remember that aggressive violent behavior may be a symptom of medical conditions such as but not limited to:

1. Head trauma
2. Alcohol/drug related problems
3. Metabolic disorders (i.e., hypoglycemia, hypoxia, etc.)
4. Psychiatric/stress related disorders

B. Patient health care management remains the responsibility of the EMS professional. The method of physical and/or pharmacologic management shall not restrict the adequate monitoring of vital signs or the ability to protect the patient's airway, compromise of the patient's peripheral neurovascular status, or otherwise prevent appropriate and necessary therapeutic measures. It is recognized that evaluation of many patient parameters requires patient cooperation and thus, may be difficult or impossible.

C. All physical management devices should have the ability to be quickly released if necessary.

D. The person who was responsible for applying a physical management device that requires a key or special releasing device must physically remain with the patient regardless of the vehicle of transport in the interest of the patient's safety. This policy is not intended to negate the need for law enforcement personnel to use appropriate patient management equipment to establish scene control.

E. Patients should be transported in the supine or decubitus position to ensure adequate respiratory and circulatory monitoring and management. All patients who require physical and/or pharmacologic management should be placed on a stretcher with adequate foam padding. Physical management devices should be secured to the stationary portion of the stretcher frame in a fashion where they can be removed quickly in the event of an emergency. Stretcher straps should be placed on all patients as these are analogous to seatbelts during transport. Physical management of the extremities in a spread eagle fashion significantly reduces the strength the patient can generate from the large muscle groups. Physical management devices that use multiple knots or that may restrict chest wall motion are unacceptable.

F. Physically managed extremities should be monitored for color, nerve and motor function, pulse quality, and capillary refill at the time of application and frequently thereafter. The patient's ventilatory status and pulse oximetry or waveform capnography should be monitored during transport.

G. After addressing and/or treating metabolic causes of aggressive or violent behavior, administration of a benzodiazepine and/or antipsychotic as a pharmacologic management measure should be considered.

H. Documentation on the EMS report for patients requiring physical and/or pharmacologic management shall include:

1. Reason for physical and/or pharmacologic management
2. Agency responsible for the application of the physical management device (i.e., EMS, police)
3. Documentation of serial cardio-respiratory status and peripheral neurovascular status

I. Prehospital care providers reserve the right to refuse elective transport of patients who are deemed too violent or uncooperative to be controlled by the physical and/or pharmacologic management methods and devices permitted by their prehospital protocols. The safety of prehospital care providers will be maintained at all times during transport. The prehospital care provider reserves the right to request completion of transport by law enforcement personnel. The prehospital care provider may administer an appropriate dose of a benzodiazepine and/or antipsychotic as a pharmacologic management measure prior to transport of the patient. The prehospital care provider reserves the right to suggest to medical facilities the use of adequate pharmacologic management medications prior to acceptance and/or initiation of transport of the patient. A decision to refuse elective transport of a violent or uncooperative patient may be made by any member of the prehospital care team or its supervisor. Medical direction may be contacted at any time for advice or for pharmacological orders.

TRANSPORT TO URGENT CARE FACILITIES OR PHYSICIAN OFFICES

EMS units should not transport patients to urgent care facilities (***free-standing emergency departments are acceptable destinations***) or private physicians' offices in response to emergency calls except:

1. When directed by medical direction.
2. If specifically authorized by on-line medical direction.
3. When the EMS unit is following protocols approved by medical direction.
4. When the EMS unit is a private service responding to a call in which the patient and/or the family requests transport to such facility and the patient is clearly in stable condition.
5. During a declared emergency disaster as directed by medical direction, a public health authority, or the governor.

NON-HOSPITAL TRANSFER GUIDELINE

GUIDELINES FOR TRANSFER FROM A NON-HOSPITAL LOCATION TO A NON-HOSPITAL LOCATION: HOME TO HOSPICE; HOSPICE TO HOME

On occasion, the out-of-hospital EMS professional(s) will be called upon to transport a patient from a non-hospital location to another non-hospital facility such as hospice center or from hospice to home or a doctor's office. The provider(s) will follow the written protocols provided by the EMS agency's medical director or, with approval from the EMS medical director, follow the written or pre-existing orders of the patient's physician or physician-approved hospice center orders for the transport. At times, a hospice nurse may arrive or already be at the scene. He/she should be able to help review orders and/or advance directives such as DNR or palliative/support care orders to enable transport in accordance with the wishes of the patient and his/her family. Enrollment in a hospice program requires the patient to accept DNR status.

Medical direction does not need to be contacted unless the DNR is revoked. However, if the EMS professional(s) feels the need to contact medical direction for advice or direction, the professional(s) will clearly advise medical direction of the patient's terminal condition and DNR status.

If medication(s) needs to be "wasted", e.g., morphine, Valium® or Versed®, then the receiving hospice supervisor, nurse or EMS supervisor may witness and document appropriate disposal of the said medication(s) and administration equipment, e.g., needle(s), syringe(s), IV catheter(s), heparin or saline lock(s) or IV lines and/or solutions. Medications or equipment should never be transported to an emergency department to be disposed of or wasted. Any and all waste materials will be disposed into approved and appropriately labeled containers.

The transportation of patients from one healthcare facility to another should be carried out in an orderly and expeditious manner. Regardless of origin or destination, patients remain the responsibility of the transferring physician until received by the accepting physician or his/her agent per federal EMTALA regulations. The transfer papers and accompanying record must document the reason for transfer as well as the time of contact and the name of the receiving facility, physician and/or accepting agent in accordance with nationally recognized standards and federal regulations.

The decision regarding the level and scope of practice of the out-of-hospital transporting agency and the individual providers should be made in consultation with the receiving physician and must be appropriate to the stability of the patient and their medical and equipment needs. While the selection of the transporting agency and level of care required during transport is the responsibility of the transferring physician, EMS professionals have the responsibility to decline any transport that requires patient care or skills that are not within the Ohio EMS scope of practice and/or the protocols provided by the medical director of the EMS agency.

The EMS professional will be responsible for carrying out the orders of the transferring physician during the transfer unless acting as the agent of the receiving facility with superseding medical direction or if a physician accompanies the patient. An EMS agency of EMS professional should decline the transport of a patient if the transferring physician presents orders for patient care for which approval, a written protocol, training, and a quality assurance program have not been provided by the medical director of the EMS agency in advance of the patient transport. Any questions or concerns regarding those orders, including but not limited to Do Not Resuscitate (DNR) orders, medications, or treatments, must be answered or clarified prior to departure. The route(s) of travel, possible diversionary medical facilities and their phone or radio call numbers should also be determined.

If unanticipated problems or concerns arise during transport, direct, on-line medical direction will be obtained. If for technical or logistical reasons this is not possible, the transporting agent should follow their written protocols or standing orders until the transferring, receiving or nearest diversionary facility can be contacted on-line.

"Resuscitation may be discontinued in the prehospital setting when the patient is non-resuscitatable after an adequate trial of ACLS."

In accordance with the Journal of American Medical Association's guidelines for cardiopulmonary resuscitation and emergency cardiac care, the above statement encourages local medical directors to develop guidelines for prehospital care providers to terminate resuscitation efforts when the patient's survivability is questionable.

A trial of ACLS, according to the guidelines, occurs when:

1) adequate BLS has been provided for a reasonable length of time;

2) endotracheal intubation has been successfully accomplished and the end tidal CO_2 has remained below 10 mm Hg by waveform capnography for greater than 20 minutes;

3) intravenous access has been achieved and rhythm-appropriate medications and countershocks for ventricular fibrillation have been administered according to local protocol; and

4) persistent asystole or agonal electrocardiographic patterns are present and no reversible causes are identified.

The State of Ohio Regional Physician Advisory Board has adopted the following criteria for termination of resuscitation efforts at the scene following unmonitored, out of hospital, adult, primary cardiac arrest.

EMS professionals under local medical direction authority may terminate resuscitation when:

1) adult cardiopulmonary arrest (not associated with trauma, body temperature aberration, respiratory etiology, or drug overdose);

2) standard ACLS in accordance with American Heart Association guidelines has been carried out for over 20 minutes;

3) no restoration of circulation (spontaneous pulse rate of greater than 60 beats per minute for at least a 5 minute period); and

4) absence of persistent, recurring, or refractory ventricular fibrillation/tachycardia or any continuous neurological activity (e.g., spontaneous respirations, eye opening or motor response).

When the above conditions have been met, the EMS professional should contact medical direction and request termination of resuscitation.

NOTE: Termination of resuscitation is not analogous or equivalent to the pronouncement of death. They are two distinctly separate and independent events and actions. Pronouncement of death is not permitted to be performed by Ohio EMS providers regardless of their level of certification. The pronouncement of death must be completed by a physician or, with the cited parameters satisfied, by the specific medical professionals listed in Ohio Administrative Code 4731-14-01.

Certified EMTs, AEMTs, and paramedics are classified, by Ohio Administrative Code 4731-14, as competent observers. Competent observers are only authorized to determine death. EMRs are not authorized to determine or pronounce death.

LITHIUM-ION POWERED VEHICLES
(ELECTRIC AND HYBRID-ELECTRIC TRANSPORATION)

EMS providers are now responding to more incidents involving electric and hybrid-electric vehicles that are fully or partially powered by lithium-ion batteries. These vehicles include, but are not limited to, automobiles, bicycles, scooters, and motorized mobility assistance devices (e.g., wheelchairs, golf carts). There are several risks associated with lithium-ion batteries about which the EMS provider should be aware in the interest of patient care and first responder protection.

High-voltage cables are connected to the vehicle's lithium-ion batteries, and they are intentionally positioned in a location that cannot be easily accessed. In a car, truck, or bus, these cables may traverse the interior body of the vehicle's door. Although they are typically orange in color, it is advisable to check the specifications provided by the vehicle manufacturer to confirm the color of these cables. While low-voltage cables pose less risk, direct contact with or severing high-voltage cables should be avoided during extrication as any exposed or damaged wires present a shock hazard. Direct contact with the chassis of a wet or submerged vehicle does not present an electrocution risk; however, wet or submerged lithium-ion batteries present an electrical shock and fire hazard.

EMS providers should always assume that a lithium-ion battery is fully charged. Whether the lithium-ion powered vehicle is a car, bicycle, or other mode of transportation, it is important to move the vehicle key at least 16 feet away from the vehicle to prevent auto-starting the engine. Delayed airbag deployment can occur after the vehicle is powered off. Unlike petroleum fueled vehicles, lithium-ion powered vehicles operate in silence which can cause people, particularly those with functional needs, to be unaware that the vehicle is actively operable or in motion.

Lithium-ion batteries present a hazard when incorrect battery charging equipment is used, charging is performed in a poorly ventilated area, the battery case is opened or damaged, the battery is ignited or overheated, or if the battery connections are wet or submerged. The greatest danger is when a lithium-ion battery is on fire or overheated to the point where toxic gasses are released. Voluminous amounts of water are required to extinguish fires from this source. The primary gasses released are carbon dioxide, carbon monoxide, hydrogen fluoride, and phosphoryl fluoride. All of these gasses are colorless and odorless. When a lithium-ion battery fire or breached battery case is confirmed or suspected, the current recommended personal protective equipment includes a self-contained breathing apparatus (SCBA) to prevent inhalation injury. If the presence of fire is confirmed or suspected, the vehicle should be ventilated immediately if people are inside or are entrapped.

The most serious toxic gas that is released from a lithium-ion battery fire is hydrogen fluoride which is hydrofluoric acid. Hydrofluoric acid is a pulmonary irritant that can cause pulmonary edema, pneumonitis, and ARDS (shock long). Hypocalcemia and hypomagnesemia are associated complications that can be treated with calcium and magnesium replacement. Although hydrogen fluoride comprises a fraction of the gasses that are released, the administration of oxygen with nebulized calcium gluconate should be considered in patients who present with severe respiratory distress in addition to the appropriate airway management. The dose of calcium gluconate for nebulization is calcium gluconate 2.5 g in 100 mL of water or it can be made by diluting 25 mL of calcium gluconate 10% in 100 mL of water.

The challenge for clinicians is that the onset of symptoms can be delayed for hours, and exposed persons may not exhibit respiratory symptoms initially or may not have any obvious physical signs of facial or oropharyngeal erythema, burns, or edema. If the release of fumes from an ignited or overheated lithium-ion battery is confirmed or suspected, potentially exposed individuals should strongly be advised to seek medical care even if they appear or report being asymptomatic. For patients who are transported, it is imperative for this information to be communicated to medical direction or the receiving emergency care facility as observation for the development of respiratory symptoms for 6 hours is recommended following exposure.

OVERVIEW

As its foundation has solidified, the depth and breadth of the capabilities and responsibilities of EMS has significantly expanded and matured. The health care delivery by EMS personnel is no longer limited to the confines of an ambulance.

Specialty care within the practice of EMS has been in existence for many years. This chapter was added to the State of Ohio Adult EMS Guidelines and Procedures Manual in 2018 and, analogous to the other chapters, will be dynamic over time. This chapter is not all-inclusive of the sectors of specialty care within EMS. The content of this chapter is solely directed at the sectors that have been formally cited by the EMFTS Board or within the Ohio Revised Code or Ohio Administrative Code.

Various institutions and organizations offer specialty care education and training, and some programs provide documentation of course completion or certification. Regardless of these documents or the training provided, the EMS provider certifications and professional titles recognized and legislatively established in the State of Ohio are emergency medical responder, emergency medical technician, advanced emergency medical technician, and paramedic. The terms or descriptors such as “community paramedic”, “critical care paramedic”, or “tactical EMS” do not exist in Ohio EMS legislation or regulation and are not recognized by the EMFTS Board. Regardless of the specialty care education or training provided, a certified Ohio EMS provider must comply with the following:

1. Function under the authority of a medical director who meets the qualifications cited in Ohio Administrative Code 4765-3-05
2. Restrict the performance of skills to the Ohio EMS scope of practice authorized by the EMFTS Board for the associated level of Ohio EMS certification.

In addition, the EMS medical director must provide authorization, a written protocol, training, continuing education, and a quality assurance program for all of the skills performed by the EMS providers under his or her medical direction. Regardless of the training or education provided, the EMS medical director may not permit skills that exceed the Ohio EMS scope of practice authorized by the EMFTS Board for the associated level of Ohio EMS certification.

In August 1996, the National Highway Transportation Safety Administration, the agency that oversees EMS at the federal level, published a pinnacle report, *Emergency Medical Services: Agenda for the Future* (*Agenda for the Future*). At the beginning of this document, there is a statement titled "The Vision" that has embraced as the overarching quest and purpose of EMS. "The Vision" states "Emergency medical services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net." With respect to the integration of health services, the *Agenda for the Future* provided the following recommendations for EMS:

- Expand the role of EMS in public health
- Involve EMS in community health monitoring activities
- Integrate EMS with other health care providers and provider networks
- Incorporate EMS within health care networks' structure to deliver quality care
- Be cognizant of the special needs of the entire population
- Incorporate health systems within EMS that address the special needs of all segments of the population

Emergency Medical Services at the Crossroads, a report published by the Institute of Medicine of the National Academies in June 2006, noted that the EMS systems remain fragmented. The report, like the *Agenda for the Future*, continued to support the evolution and incorporation of EMS as an integral component of the overall healthcare system. One of the recommendations was for the Department of Health and Human Services, the Department of Transportation, and the Department of Homeland Security to jointly undertake a detailed assessment of the emergency and trauma workforce capacity, trends, and future needs, and develop strategies to meet these needs in the future. The report describes a vision of a 21st century emergency care and trauma system where 9-1-1 dispatchers, EMS personnel, medical providers, public safety officers, and public health officials are interconnected and united to ensure that each patient receives the most appropriate care, at the optimal location, with minimal delay.

Over the past several decades, the model of medical care delivery has shifted significantly from the inpatient setting to the outpatient setting. The stimuli for the generation of this model includes, but is not limited to, advancements in medical technology and treatment modalities, a need for improved fiscal oversight and allocation of resources, and the desire of the general public to access and receive care without enduring a separation from their residential environment. In addition, our nation's philosophy of acceptable healthcare has shifted its focus placing a greater emphasis on health maintenance and on illness and injury prevention.

Mobile integrated healthcare is another step toward more aggressive maintenance of health and wellness in an outpatient setting, and EMS providers play an integral role in its administrative and operational framework. Secondary benefits of an effective mobile integrated healthcare system include the creation of a closer relationship between a patient and their local healthcare assets and the potential reduction in the need for inpatient care.

On June 30, 2015, the Ohio Revised Code was amended to allow Ohio EMS providers to perform services in non-emergency settings. The new law, Ohio Revised Code 4765.31, created a path for mobile integrated healthcare to exist in Ohio. Per this law, Ohio EMS personnel including, but not limited to, community paramedics, providing non-emergency care must:

1. Function within the Ohio EMS scope of practice that is determined by the State of Ohio Board of Emergency Medical, Fire, and Transportation Services Board (EMFTS Board)
2. Function under the authority of a medical director that meets the qualifications cited in the Ohio Administrative Code 4765-3-05.

While both organizations can offer support, it is not the directive nor is it the desire of the EMFTS Board or the Ohio Department of Public Safety, Division of EMS to be prescriptive or to mandate the structure of a mobile integrated healthcare system. There are several advisories that have been approved by the National EMS Advisory Council and presented to the Federal Interagency Committee on EMS that support key supportive and operational elements related to mobile integrated healthcare such as reimbursement for services provided and the completion of a practice analysis to guide education, provider qualifications, and scopes of practice specific to the specialty.

The foundation of a mobile integrated healthcare system is based solely in the heart of the community. The local healthcare consumers and providers are in the best position to identify the deficiencies in medical resources and access to care. Therefore, a community's caregivers, consumers, patients, and healthcare stakeholders must unite in a spirit of collaboration to build a mobile integrated healthcare system that fills the existing gaps in medical care delivery and best meets the identified needs. Mobile integrated healthcare is a team sport, and the contributions of allied healthcare professionals, including EMS providers, are essential elements required for creation and launch of a successful system.

OPIOID OVERDOSE BRIDGE PROGRAMS

According to the Centers for Disease Control and Prevention (CDC), the number of deaths due to drug overdose continues to increase. In 2020, Ohio was ranked as the state with the 4th highest death rate in the nation at 47.2 deaths/100,000 total population. Sadly, an overwhelming portion of these deaths are due to opioid overdoses. The influx of high-potency opioids, e.g., fentanyl and carfentanil, disguised in counterfeit narcotic tablets, as additives to heroin, cocaine, and other illicit drugs, or as primary drugs of abuse has contributed to increases in morbidity and mortality.

Inpatient and outpatient drug rehabilitation centers prescribe buprenorphine, a partial opioid agonist, or a combination of buprenorphine and naloxone (Suboxone®) to treat opioid use disorder (OUD). These medications diminish the effects of physical dependency to opioids, such as withdrawal symptoms and cravings, increase safety in cases of overdose, and lower the potential for misuse. In addition to the provision of naloxone for the acute treatment of an opioid overdose, the EMS sector has become engaged with the initiation or distribution of medications for opioid use disorder. This action is an initiative to provide a patient with a "bridge" of survival and a link to drug rehabilitation resources.

Bridge programs are created at the local level based upon partnership with and utilization of available community drug rehabilitation resources. Various models include, but are not limited to, EMS personnel providing buprenorphine or Suboxone® during a 911-dispatched response to an opioid overdose where the recovered patient refuses transport, in partnership with a mobile mental health unit, or within the realm of mobile integrated healthcare. Local public health agencies, healthcare facilities, and psychiatrists can provide information to EMS agencies regarding the drug rehabilitation resources available within a community along with their respective capabilities and locations. In addition, the U.S. Department of Health and Human Services' Substance Abuse and Mental Health Services Administration maintains a list of all of the psychiatric facilities in the nation (www.SAMHSA.gov).

During the creation of an EMS-supported opioid overdose bridge program, the following information should be considered:

1. The local EMS medical director must authorize the provision of OUD medications and provide a written protocol, education and continuing education on their use, and a quality assurance program. All medications authorized by the EMS medical director must be listed on the State of Ohio Board of Pharmacy drug license for the EMS agency.

2. Suboxone® is preferred over buprenorphine. Patients receiving buprenorphine without naloxone as an OUD medication should have abstained from opioids for at least 12 to 24 hours or be in the early stages of withdrawal to prevent the adverse effect of acute opioid withdrawal.

3. The appropriate dose of OUD medications varies based upon the patient's age, weight, and the potency of the opioid taken or abused. Patients who use high-potency opioids may require higher doses of OUD medications than patients who use opioids of lower potency. Data from local public health and law enforcement agencies may be helpful when performing a risk analysis of the presence and incidence of high-potency opioid use within a community.

4. Ideally, the provision of Suboxone® or buprenorphine should be paired with immediate enrollment in a drug rehabilitation program or supported with ongoing treatment from such a program within a mobile mental health unit or mobile integrated health program. When EMS is the primary responder to a patient who has recovered from an opioid overdose and refuses transport, a written contractual agreement between the patient and a drug rehabilitation resource is suggested prior to the provision of these OUD medications. The patient should provide consent for the EMS personnel to share their name, contact information, birthdate, and other demographic information to the drug rehabilitation resource.

5. Due to its rapid therapeutic action in the scenario of an acute opioid overdose, the provision of naloxone (Narcan®), if available for distribution, should not be withheld from any patient, even if transport is refused following recovery from an opioid overdose.

Austere environments can be encountered when dispatched to any scene or may unpredictably evolve after arrival on scene. Lessons learned from military experience and historic tragic events in the civilian setting have taught us that the identification and rapid treatment of life-threatening injuries saves lives. The patient treatment measures that were first crafted by the military as Tactical Combat Casualty Care has evolved into the civilian model, Tactical Emergency Casualty Care (TECC) which was created by the Committee on Tactical Emergency Casualty Care (C-TECC). While the TCCC model was primarily based on relatively health and young military personnel, the guidelines offered within TECC encompass the needs of the entire population which includes pediatric and geriatric patients and those with co-morbid conditions.

The patient care measures cited within TECC were created for all EMS providers. The use of TECC is not limited to specialty care teams such as rescue task forces or tactical EMS units. TECC can be utilized by all persons who are willing and able to respond, including non-medical personnel such as law enforcement personnel (First Responders with a Duty to Act) and civilians (First Care Providers), to a level appropriate to their respective training and/or scope of practice.

As demonstrated by many events involving austere environments in the civilian setting, the initial effective emergency care is frequently provided by the First Care Provider (formerly known as the bystander or layperson). Their basic actions have been the critical factor in preserving life until EMS arrives and the patient is transported to an appropriate facility for definitive interventions. While the C-TECC has produced guidelines for several levels of responders, the following guidelines were written specifically for those trained and authorized to provide basic or advanced life support. It is important to note that, within an austere environment, the reference to the "patient" and the associated treatment interventions encompasses any injured person on scene including the victim, a fellow EMS professional, law enforcement officer, or alleged perpetrator as well as self-care. In addition, First Care Providers and/or First Responders with a Duty to Act should be tasked to provision of TECC to patients, at the level appropriate with their skill and training, rather than being dismissed upon the arrival of EMS personnel. Additional lives can be saved with their additional manpower and assistance in the provision of basic life-saving TECC measures to patients unless the threat warrants evacuation of the TECC providers from the scene.

The guidelines for patient care by EMS are first driven by definition of the zone in which patient care is needed. These zones are as follows:

Hot Zone – An area of direct or immediate threat
Warm Zone – An area of indirect threat where the site has been cleared by law enforcement personnel, but not secured
Cold Zone – An area where there is no known threat

The current TECC guidelines for rapid life-saving treatment in hot and warm zones, modified to align with the Ohio EMS scope of practice, are cited below. The patient care provided in the cold zone should be the standard traditional care based upon the patient's injury or illness and the patient's condition. The vast majority of these patient care measures can be performed by all Ohio EMS providers except where noted due to the parameters of the Ohio EMS scope of practice. **All patient care measures require authorization, a written protocol, training, continuing education, and a quality assurance program from the EMS medical director.**

Direct Threat Care/Hot Zone

1. Mitigate any immediate threat and move to a safer position (e.g. initiate fire attack, coordinate ventilation, move to safe haven, evacuate from an impending structural collapse, etc.).
   a. Recognize that threats are dynamic and may be ongoing, requiring continuous threat assessments.

2. Direct the injured first responder to stay engaged in the operation if able and appropriate.

3. Move patient to a safer position:
   a. Instruct the alert, capable patient to move to a safer position and apply self-aid.
   b. If the patient is *responsive* but is injured to the point that he/she cannot self-evacuate, a rescue plan should be devised.
   c. If a patient is *unresponsive*, weigh the risks and benefits of a rescue attempt.
      i. Remote medical assessment techniques should be considered to identify patients who are dead or have apparently non-survivable wounds.
      ii. Rescue attempts should only be initiated on patients with wounds that appear to be survivable.

3. Stop life threatening external hemorrhage with a tourniquet. Consider moving to safety prior to application of the tourniquet depending on the level of immediate threat, severity of the bleeding and the evacuation distance to safety.

4. Apply direct pressure to wound, or direct capable patient to apply direct pressure to own wound and/or (self-apply) own effective tourniquet.
   a. Tourniquet application:
      i. Apply the tourniquet(s) as high on the limb as possible, including over the clothing if present.
      ii. Tighten as much as possible and move to safety.

5. Consider quickly placing patient, or directing the patient to be placed, in a position to protect airway.

Indirect Threat Care/Warm Zone

1. Any injured person or responder with a weapon should have that weapon made safe/secured once the threat is neutralized and/or if mental status is altered.

2. Major Bleeding*:*
   a. Assess for and control all sources of major bleeding:
      i. If not already done during direct threat/hot zone care, use a tourniquet or an appropriate pressure dressing with deep wound packing (either plain gauze or, if available, hemostatic gauze) to control life-threatening external hemorrhage that is anatomically amenable to such treatment.
         - *Tourniquet application*: Apply the tourniquet over the clothing as proximal as possible and tighten as much as possible, or if situation allows, consider fully exposing and evaluating the extent of the wound before applying tourniquet directly to the skin 2-3 inches above wound (Do not apply over the joint) and tightening as much as possible.
         - *Pressure dressing application*: apply directly to the skin after the wound has been packed with either plain or hemostatic gauze to translate the surface pressure exerted by the bandage to the bleeding vessels deep in the wound.
         - For any traumatic total or partial amputation, a tourniquet should be applied in an appropriate location regardless of bleeding
      ii. If major bleeding is in anatomic junctional area where that bleeding cannot be easily controlled by direct pressure and/or hemostatic dressings, apply a junctional tourniquet device if immediately available.
   b. Reassess all tourniquets that were applied during direct threat/hot zone care. Consider checking a distal pulse, or if the situation allows, fully exposing the injury to evaluate the wound for effective hemorrhage control and to determine if the tourniquet is needed.
      i. Tourniquets that are determined to be both *necessary and effective* in controlling hemorrhage should remain in place if the patient can be evacuated within 2 hours to definitive medical care.
      ii. If existing tourniquet is *necessary but ineffective* (continued bleeding or a palpable distal pulse), either tighten the existing tourniquet further, or apply a second tourniquet, side-by-side and, if possible, proximal to the first to eliminate the distal pulse.
      iii. If a tourniquet is determined based on wound assessment *to not be necessary*, use other techniques to control bleeding and remove the tourniquet.

c. Consider tourniquet downgrade or tourniquet conversion if there will be a delay in evacuation more than 2 hours. On any patient who is receiving resuscitation for hemorrhagic shock, ensure a positive response to resuscitation efforts (e.g. improving mentation and peripheral pulses normal in character) before downgrading or converting a tourniquet. Criteria for tourniquet downgrade or conversion:
   - Patient not in hemorrhagic shock
   - Able to subsequently monitor wound closely
   - Tourniquet is not on an amputated or partially amputated limb
   - No prior unsuccessful attempts to remove the tourniquet

   i. Downgrade: Expose the wound fully, identify an appropriate location at least 2-3 inches above the injury (not over a joint), and apply a new tourniquet directly to the skin. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.
   ii. Conversion: Expose the wound fully, fully pack the wound with hemostatic or plain gauze, and properly apply a pressure dressing. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.
   iii. If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.

d. Expose and clearly mark all tourniquet sites with the time of tourniquet application.

3. Airway Management:

a. If the patient is conscious and able to follow commands:
   i. Allow the patient to assume any position of comfort. Do not force to lie down.

b. If the patient is unconscious or conscious, has a pulse, is not apneic, but is unable to follow commands:
   i. Clear mouth of any foreign bodies (vomit, food, broken teeth, gum, etc.).
   ii. Apply basic chin lift or jaw thrust maneuver to open airway.
   iii. Consider placing a nasopharyngeal airway.
   iv. Place patient in the recovery position to maintain the open airway.

PARAMEDIC

c. If previous measures are unsuccessful and equipment is available under an approved protocol, consider:
   i. Extraglottic airway devices
   ii. Orotracheal/nasotracheal intubation
   iii. Surgical cricothyroidotomy (with lidocaine if conscious)

EMT

d. Consider applying oxygen if available.

4. Respirations/Breathing:

a. All open and/or sucking chest wounds should be treated by immediately applying a vented occlusive seal, if available, to cover the defect or leave the wound open.

b. Monitor any patient with penetrating torso trauma for the development of a subsequent tension pneumothorax. The most common presentation will be a penetrating chest injury with subsequent progressive dyspnea/respiratory distress, hypoxia and/or hypotension, and/or increasing anxiety/agitation, often after the application of an occlusive chest seal.

AEMT

c. If tension pneumothorax is suspected to be present or developing, decompress the chest on the side of the injury. Needle decompression should be performed with, at minimum, a 14-gauge, 3.25 inch needle/catheter. Potential decompression sites/procedures include:
   i. Anterior decompression: Insert the needle in the 2nd intercostal space at the midclavicular line. Ensure that the needle entry into the chest is *lateral to the nipple line* and is *not* directed towards the heart.

ii. Lateral decompression: Insert the needle in the 4-5th intercostal space perpendicular to the chest wall, anterior to the mid- axillary line on the injured side. This should be done only if properly trained and under an approved local protocol.

EMT

iii. Non-invasive decompression: remove the occlusive dressing and physically "burp" the chest seal.

5. Intravenous (IV) Access:

AEMT

i. If immediate fluid resuscitation is required and is available, consider starting at least an 18-gauge IV or obtaining intraosseous (IO) access.

6. Tranexamic Acid (TXA)*

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a. If patient has injuries that could potentially require significant blood transfusion (e.g. presents in hemorrhagic shock in the setting of penetrating torso trauma, multiple amputation(s), and/or evidence of severe uncontrolled internal or external bleeding) consider administration of 1 gram of TXA as soon as possible.
   i. Do *not* administer TXA later than 3 hours after injury.

7. Shock Management/Fluid Resuscitation:
   a. Assess for developing hemorrhagic shock
      i. Altered mental status (in the absence of head injury) and weak or absent peripheral pulses are the best austere field indicators of shock.
      ii. If equipment available, assess for abnormal vital signs (e.g. systolic blood pressure (SBP) <90 mmHg with/without heart rate >100 bpm) or a shock index >1 (HR/SBP)
   b. If not in hemorrhagic shock:
      i. Patient may drink if conscious, can swallow, and there is a confirmed delay in evacuation to care.

AEMT

      ii. No IV fluids necessary but consider intravascular access with saline lock.
   c. If hemorrhagic shock is present:

PARAMEDIC

      i. Resuscitate using permissive hypotension in the non-head injured patient. Administer IV fluid bolus (per agency protocol) to a goal of improving mental status, radial pulses, or, if monitoring is available, measured SBP>80mmHg. Repeat bolus once after 30 minutes if still in shock.
      ii. If a blood transfusion has been initiated by a nurse or physician on scene, maintain the transfusion.
   d. In a patient who has altered mental status due to suspected or confirmed traumatic brain injury, avoid any hypotension.
      i. Resuscitate aggressively with fluid boluses to a goal of improving mental status, strong peripheral pulses or, if monitoring is available, maintain measured SBP>90-100 mmHg.

EMT

      ii. Position patient with head elevated 30 degrees if possible.
   e. Prioritize for rapid evacuation any patient with traumatic brain injury or any patient, especially those with penetrating torso injury, that is displaying signs of shock.

8. Prevention of Hypothermia:
   a. Minimize patient's exposure to the elements and subsequent heat loss.
      i. Avoid cutting off or removing clothes unless absolutely necessary for wound evaluation.
      ii. For public safety casualties, keep protective gear on or with the patient if feasible.

b. Keep the patient covered, warm and dry.
   i. Place the patient onto an insulated surface as soon as possible to decrease conduction from cold ground temperatures.
   ii. Minimize exposure to the elements.
   iii. Replace wet clothing with dry if possible.
   iv. Cover the patient with dry blankets, jackets, poncho liners, sleeping bags, commercial warming devices or anything that will retain heat and assist in keeping the patient dry.
   v. Warm fluids are preferred if IV fluids are administered.

9. Reassess Patient:
   a. Perform a rapid blood sweep/secondary survey, front and back, checking for additional injuries. Tearing or cutting clothing, or otherwise exposing the wound may be necessary.
   b. Inspect and consider dressing known wounds that were deferred for treatment in earlier steps of indirect threat care.
   c. Consider splinting known/suspected fractures, including the application of pelvic binding devices/ techniques for suspected pelvic fractures.

10. Analgesia
   a. Provide adequate analgesia as necessary for the patient.
      i. For mild to moderate pain, consider oral non-narcotic medications. Avoid the use of non-steroidal anti-inflammatory medications (e.g. aspirin, ibuprofen, naproxen, ketorolac, etc.) in the trauma patient as these medications interfere with platelet functioning and may exacerbate bleeding.

AEMT

      ii. For moderate to severe pain, consider use of narcotic medications (hydrocodone, oxycodone, transmucosal fentanyl citrate, etc.). Sedating medications require an increased level of monitoring
         (a) Have naloxone readily available whenever administering opiates.
         (b) Monitor for adverse effects such as respiratory depression or hypotension. Consider the effect of opioid-induced altered mental status on subsequent operations and required resources.
         (c) Consider adjunct administration of anti-emetic medicines.

11. Burns:
   a. Stop the burning process.
   b. Cover the burn area with dry, sterile dressings and initiate aggressive measures to prevent heat loss and hypothermia.
   c. Facial burns, especially those that occur in closed spaces, are likely associated with inhalation injury. Aggressively monitor airway status and, if available, oxygen saturation in such patients and consider early definitive airway management for respiratory distress, oxygen desaturation, or other signs of inhalational injury (e.g. hoarseness, stridor, throat pain).
   d. Smoke inhalation, particularly in a confined space, may be associated with significant carbon monoxide and cyanide toxicity.
      i. Significant symptoms of smoke inhalation and carbon monoxide toxicity should be treated with high flow oxygen if available.
      ii. Significant symptoms of smoke inhalation and cyanide toxicity should be considered candidates for cyanide antidote administration.
   e. Estimate total body surface area (TBSA) burned to the nearest 10% using the appropriate locally approved burn calculation formula.
      i. If burns are greater than 20% of Total Body Surface Area, fluid resuscitation should be initiated as soon as IV/IO access is established.
      ii. If hypotension is also present, fluid resuscitation as per the guidelines #7. Permissive hypotension resuscitation principles for hemorrhagic shock take precedence over burn resuscitation.

f. All previously described patient care interventions can be performed on or through burned skin in a burn patient.
g. Analgesia in accordance with TECC guidelines #10 should be administered.

12. Monitoring:
a. Apply appropriate monitoring devices and/or diagnostic equipment if available. Obtain and record vital signs.

13. Prepare Patient for Movement:
a. Consider environmental factors for safe and expeditious evacuation.
b. Secure patient to a movement assist device when available.
c. If vertical extraction required, ensure patient is secured appropriately.

14. Communicate with the patient if possible.
a. Encourage, reassure and explain care.

15. Cardiopulmonary Resuscitation*:*
a. CPR within this phase of care for victims of blast, penetrating or blunt trauma who have no pulse, no ventilations, and no other signs of life will likely not be successful and should not be attempted.

PARAMEDIC

i. Consider bilateral needle decompression for victims of torso or multiple trauma with no respirations or pulse to ensure tension pneumothorax is not the cause of cardiac arrest prior to discontinuation of care.

EMT

b. In other circumstances, performing CPR *may be* of benefit and should be considered in the context of the operational situation.

16. Documentation of Care:
a. Document clinical assessments, treatments rendered, and changes in the patient's status in accordance with local protocol. Forward this information with the patient to the next level of care.

Evacuation Care/Cold Zone

1. Reassess all interventions applied in previous phases of care.
a. If multi-patient event, perform primary triage per local protocols for priority and destination.

2. Airway Management:
a. The principles of airway management in evacuation care/cold zone are the same as that in indirect threat care/warm zone with the addition of increased utility of extraglottic airway devices And, for certified Ohio paramedics, definitive airway control with endotracheal intubation.
b. Consider applying oxygen if available.
c. If intubated and attached to a mechanical ventilator, consider lung protective strategies and reassess for respiratory decline in patients with potential pneumothoraces.
d. Consider the mechanism of injury and the need for spinal motion restriction.
i. Routine spinal immobilization is not recommended and may be harmful for casualties with penetrating trauma.
ii. Maintain high clinical suspicion for casualties for geriatric patients with blunt trauma.
iii. Adequate spinal motion restriction may be maintained by keeping the patient calm, coaching of the patient to limit movement and by positioning in a supine position on a firm surface.

iv. Patients may be clinically cleared under a locally approved selective spinal motion restriction protocol if they have none of the following:
- Midline cervical spine tenderness
- Neurologic impairment
- Altered mental status
- Distracting injury
- Intoxication

3. Respirations/Breathing:
   a. All open and/or sucking chest wounds should be treated by immediately applying a vented occlusive seal, if available, to cover the defect or leave the wound open.
   b. Monitor the patient for the potential development of a subsequent tension pneumothorax. Tension pneumothoraces should be treated as in indirect threat care/warm zone.
      i. Symptoms include, but are not limited to, progressive respiratory distress, hypoxia and/or hypotension in the setting of known torso trauma
   c. Reassess casualties who have had chest seals applied or had needle decompression. If there are signs of continued or progressive respiratory distress:
      i. Consider repositioning the patient, burping the chest seal. If this results in improved clinical status, the decompression can be repeated multiple times.

PARAMEDIC

      ii. Consider repeating the needle decompression. If this results in improved clinical status, the decompression can be repeated as needed.

EMT

   d. Administration of oxygen may be of benefit for all traumatically injured patients, especially for the following types of casualties:
      - Low oxygen saturation by pulse oximetry
      - Injuries associated with impaired oxygenation
        - ❑ Unconscious patient
        - ❑ Patient with traumatic brain injury (maintain oxygen saturation 94-98%)
        - ❑ Patient in shock
        - ❑ Patient at altitude
        - ❑ Patient with known/suspected pneumothorax

4. Major Bleeding:
   a. Assess for any unrecognized or untreated bleeding.
      i. If not already done, use a tourniquet or an appropriate pressure dressing with deep wound packing to control life-threatening external hemorrhage that is anatomically amenable to such treatment.
         - *Tourniquet application*: Apply the tourniquet directly to the skin 2-3 inches above wound (Do not apply over the joint) and tighten as much as possible.
         - *Pressure dressing application*: apply directly to the skin after the wound has been packed with either plain or hemostatic gauze to translate the surface pressure exerted by the bandage to the bleeding vessels deep in the wound.
         - For any traumatic total or partial amputation, a tourniquet should be applied in an appropriate location regardless of bleeding.
         - Expose and clearly mark all tourniquets with time of application.
   b. Re-assess effectiveness and clinical indications for all tourniquets that were applied during previous phases of care.
      i. Tourniquets that are determined to be both *clinically indicated and effective* in controlling hemorrhage should remain in place if the patient can be evacuated within 2 hours to definitive medical care.

ii. If existing tourniquet is *clinically indicated but ineffective* (continued bleeding or a palpable distal pulse), either tighten the existing tourniquet further, or apply a second tourniquet, side-by-side and, if possible, proximal to the first to eliminate the distal pulse.

iii. If a tourniquet is determined based on wound assessment *to not be clinically indicated*, use other techniques to control bleeding and remove the tourniquet.

c. Consider tourniquet relocation, downgrade, or conversion if there will be a delay in evacuation more than 2 hours. On any patient who is receiving fluid resuscitation (including blood products) for hemorrhagic shock, ensure a positive response to resuscitation efforts (e.g. improving mentation and peripheral pulses normal in character) before downgrading/converting a tourniquet. Criteria for tourniquet downgrade/conversion:

- Patient is not in hemorrhagic shock
- Able to subsequently monitor wound closely
- Tourniquet is not on an amputated or partially amputated limb
- No prior unsuccessful attempts to remove the tourniquet

i. Downgrade: Expose the wound fully, identify an appropriate location at least 2-3 inches above the injury (not over a joint), and apply a new tourniquet directly to the skin. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.

ii. Conversion: Expose the wound fully, fully pack the wound with hemostatic or plain gauze, and properly apply a pressure dressing. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.

iii. Tourniquet relocation: Expose the wound fully, identify an appropriate location at least 2-3 inches above the injury (not over a joint), and apply a new tourniquet directly to the skin. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.

iv. If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.

5. Tranexamic Acid:

PARAMEDIC

a. If patient has injuries that could potentially require significant blood transfusion (e.g. presents in hemorrhagic shock in the setting of penetrating torso trauma, multiple amputation(s), and/or evidence of severe uncontrolled internal or external bleeding) consider administration of TXA 1 gm IV as soon as possible.

i. Do *not* administer TXA later than 3 hours after the injury.

6. Shock Management / Fluid resuscitation:

a. Reassess for hemorrhagic shock (altered mental status in the absence of brain injury, weak or absent peripheral pulses, and/or change in pulse character). In this phase, BP monitoring should be available. If so, maintain target systolic BP above 80-90 mmHg.

AEMT

b. Establish intravenous or intraosseous access if not performed in indirect threat care/warm zone phase.

PARAMEDIC

c. Management of resuscitation as in indirect threat care/warm zone with the following additions:

i. If in hemorrhagic shock and blood products are not available or not approved under scope of practice/local protocols, fluid resuscitate as in indirect threat care/warm zone.

ii. If a blood transfusion has been started by nurse or physician on scene, maintain the transfusion of blood or blood products.

(a) Continue resuscitation as needed to maintain target BP or clinical improvement.

d. In a patient who has altered mental status due to suspected or confirmed traumatic brain injury, avoid any hypotension.

i. Resuscitate aggressively with fluid boluses to a goal of improving mental status, strong peripheral pulses or, if monitoring available, maintain measured SBP>90-100 mmHg.

EMT

ii. Position patient with head elevated 30 degrees if possible.

7. Prevention of Hypothermia:
   a. Minimize patient's exposure to the elements. Move into a medic unit, vehicle, or warmed structure if possible. Avoid cutting off or removing clothes unless necessary for wound exposure.
      i. For public safety casualties, keep protective gear on or with the patient if feasible.
   b. Replace wet clothing with dry if possible.
   c. Place the patient onto an insulated surface as soon as possible to decrease conductive heat loss to the cold ground.
   d. Cover the patient with dry blankets, jackets, poncho liners, sleeping bags, commercial warming devices or anything that will retain heat and keep the patient dry.
   e. Warm fluids are preferred if IV fluids are required.

8. Monitoring
   a. Institute electronic monitoring if available, including pulse oximetry, cardiac monitoring, end-tidal CO_2, and blood pressure.
   b. Obtain and record vital signs.

9. Reassess Patient:
   a. Complete secondary survey checking for additional injuries. Inspect and dress known wounds that were previously deferred.
   b. Determine mode and destination for evacuation to definitive care.
   c. Splint known/suspected fractures and recheck pulses.
   d. Apply pelvic binding techniques or device for suspected unstable pelvic fractures.

10. Provide Analgesia as Necessary:
   a. Provide adequate analgesia as necessary for the casualties:
      i. Have naloxone readily available whenever administering opiates.
      ii. Monitor for adverse effects such as respiratory depression or hypotension. Consider the effect of opioid-induced altered mental status on subsequent operations and required resources.
      iii. For mild to moderate pain, consider oral non-narcotic medications. Avoid the use of non-steroidal anti-inflammatory medications (e.g. aspirin, ibuprofen, naproxen, ketorolac, etc.) in the trauma patient as these medications interfere with platelet functioning and may exacerbate bleeding

AEMT

      iv. For moderate to severe pain, consider use of narcotic medications (hydrocodone, oxycodone, transmucosal fentanyl citrate, etc.). Sedating medications require increased level of monitoring.
      v. Consider adjunct administration of anti-emetic medicines

11. Burns:
   a. Burn care and resuscitation is consistent with the principles described in indirect threat care/ warm zone.
   b. Smoke inhalation, particularly in a confined space, may be associated with significant carbon monoxide and cyanide toxicity.
      i. Significant symptoms of smoke inhalation and carbon monoxide toxicity should be treated with high flow oxygen if available.
      ii. Significant symptoms of smoke inhalation and cyanide toxicity should be considered candidates for cyanide antidote administration.
   c. Be cautious of off-gassing from patient in the evacuation vehicle if there is suspected chemical exposure (e.g. cyanide) from the fire.

d. Consider early airway management if the patient has signs of significant airway thermal injury (e.g. oral edema, hoarseness, stridor, throat pain, carbonaceous material in the posterior pharynx and respiratory difficulty) or if there is a prolonged evacuation period.

12. Traumatic Brain Injury (TBI):
    a. Prevention of hypotension and hypoxia are critical in management of TBI.

PARAMEDIC

    b. TBI patients should have available monitoring equipment applied and should be resuscitated to a minimum SBP > 90-100 mmHg.

EMT

    c. Raise the head of the bed or stretcher 30 degrees if patient is not in hemorrhagic shock.

13. Prepare Patient for Movement:
    a. Consider environmental factors for safe and expeditious evacuation.
    b. Secure patient to a movement assist device when available.
    c. If vertical extraction required, ensure patient secured appropriately.

14. Communicate with the patient if possible and with the receiving facility.
    a. Encourage, reassure and explain care to patient.
    b. Notify receiving facility of wounds, patient condition, and treatments applied.

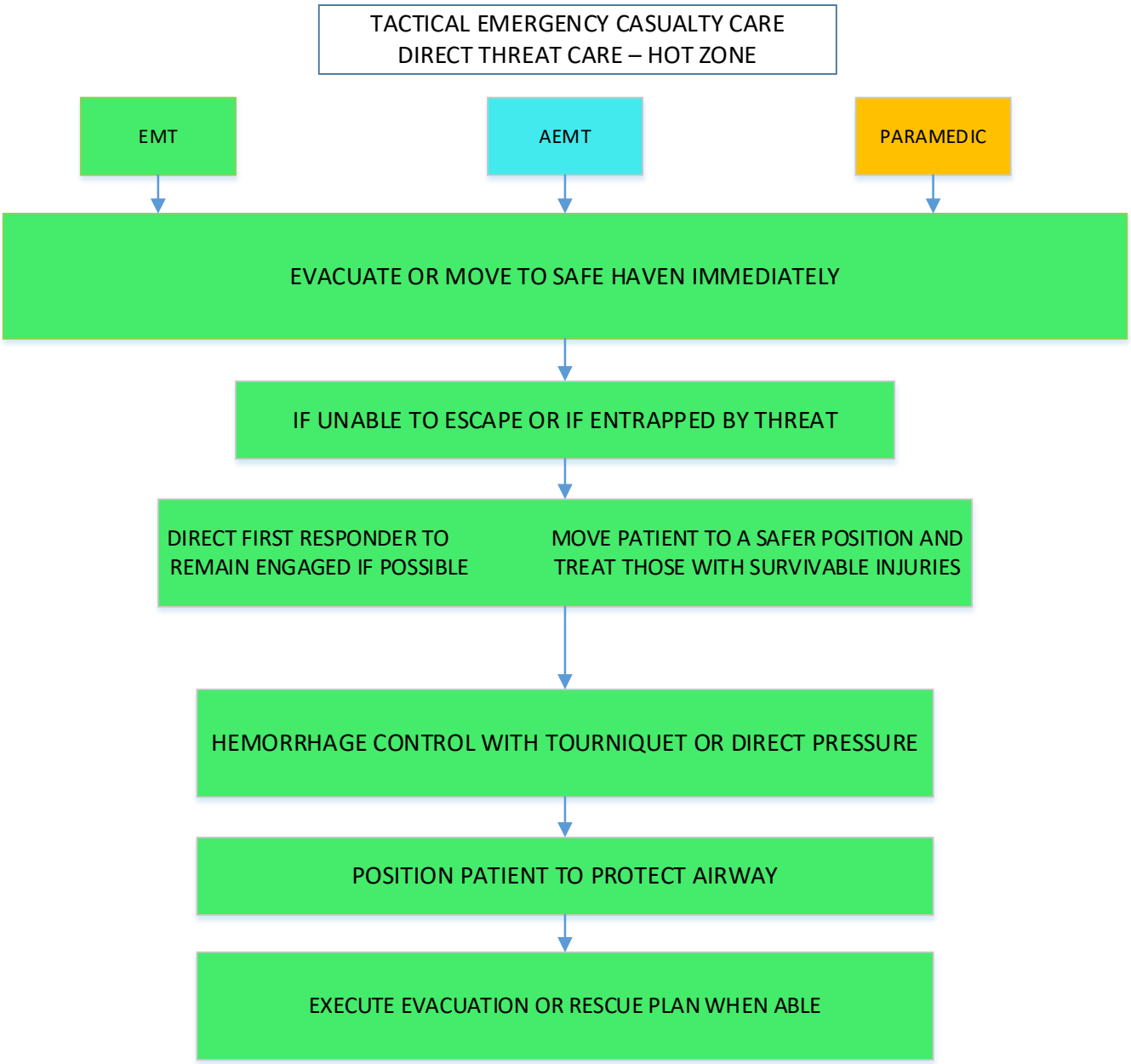
15. Cardiopulmonary Resuscitation:
    a. CPR may have a *larger role* during the evacuation phase especially for patients with electrocution, hypothermia, non-traumatic arrest or near drowning.

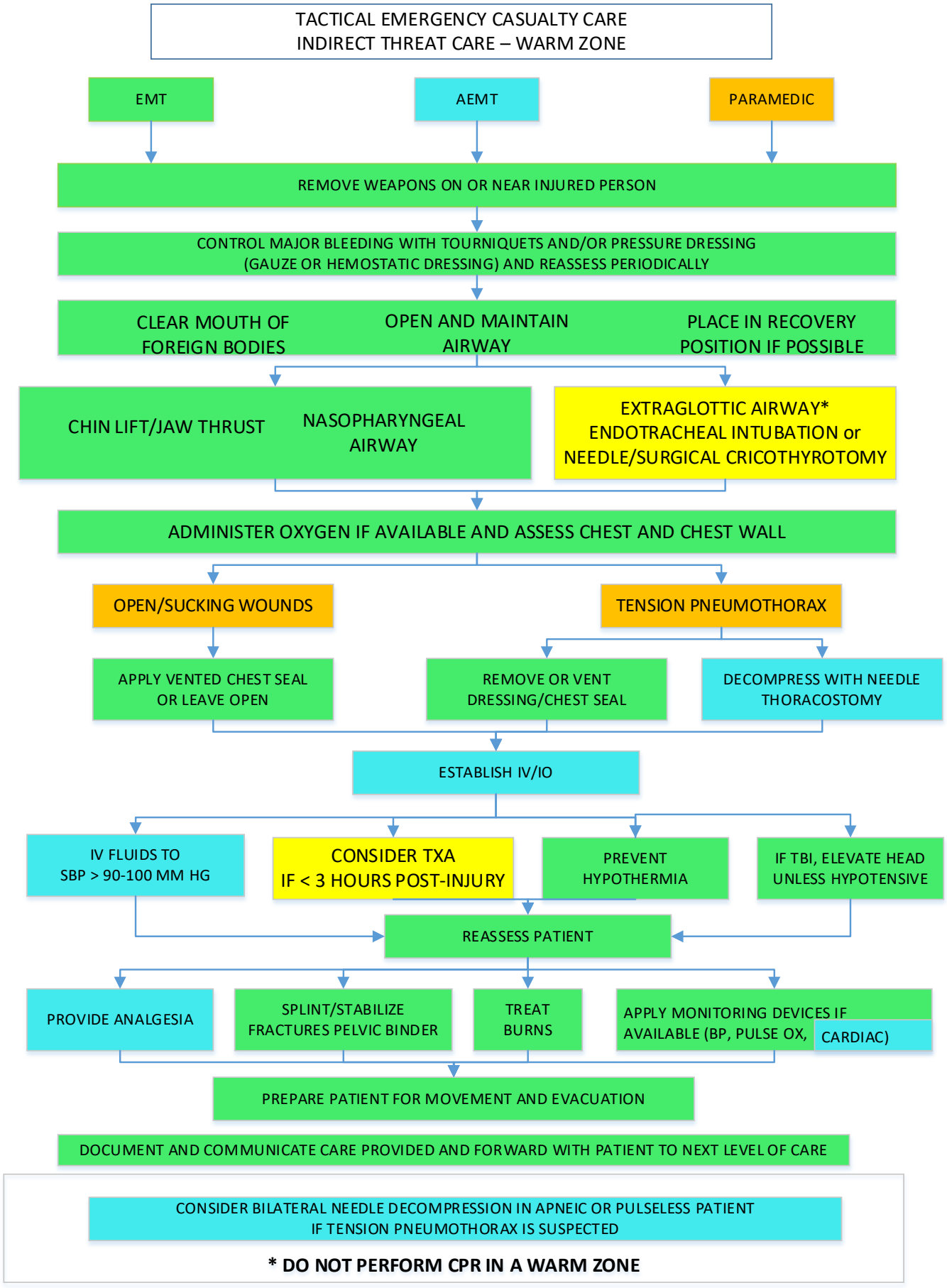
PARAMEDIC

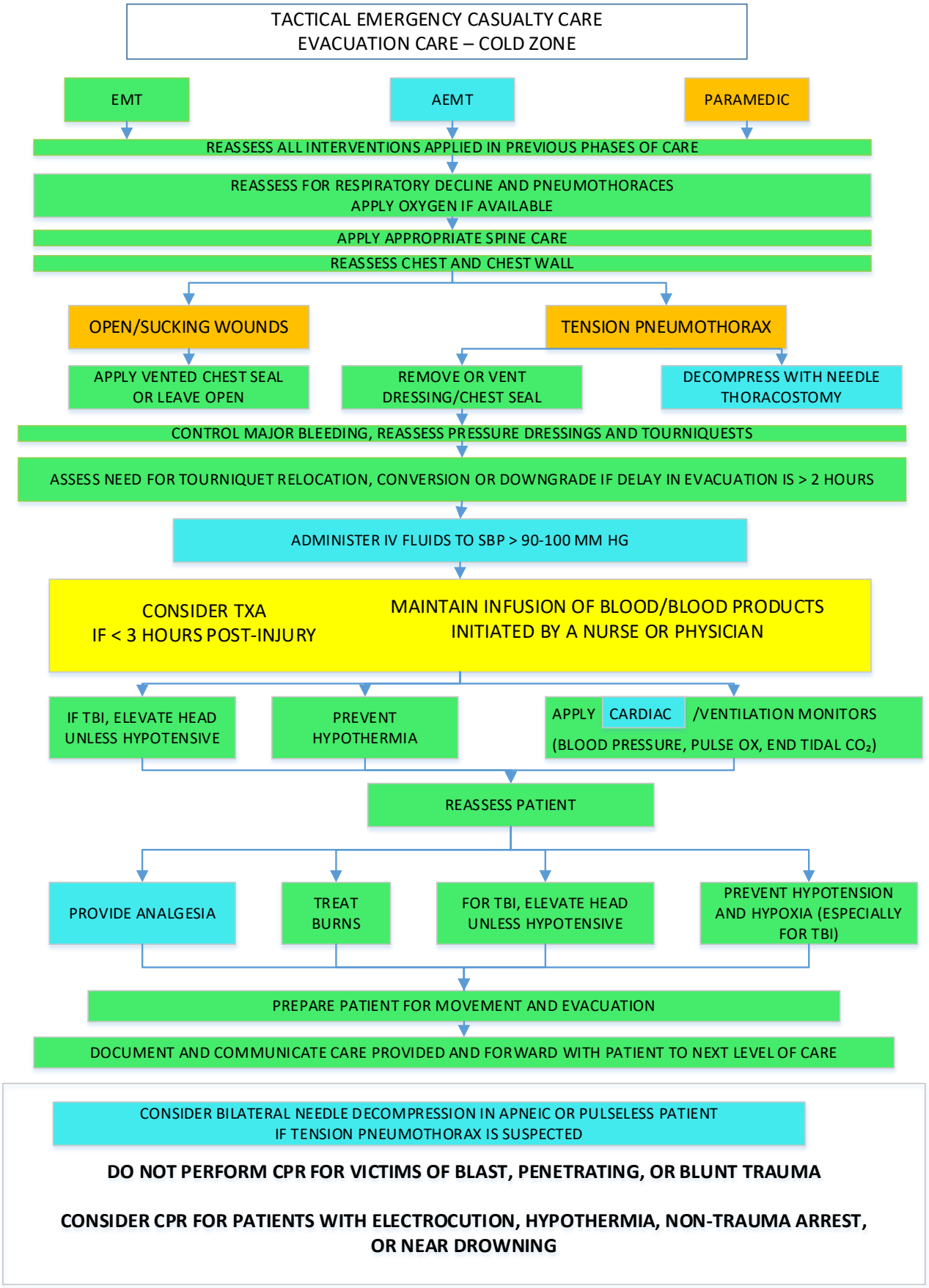
    b. Consider bilateral needle decompression for victims of torso or multiple trauma with no respirations or pulse to ensure tension pneumothorax is not the cause of cardiac arrest prior to discontinuation of care.

16. Documentation of Care:
    a. Continue or initiate documentation of clinical assessments, treatments rendered, and changes in the patient's status in accordance with local protocol.
    b. Forward this information with the patient to the next level of care.

***NOTE:** EMS medical directors who elect to include the administration of tranexamic acid within an EMS protocol should do so with engagement of and collaboration with their respective local or regional trauma system network and colleagues. To achieve the maximal efficacy of this medication, patients who receive tranexamic acid in the prehospital setting should be transported to a trauma center that also includes this medication as an option within the facility's hemorrhage control protocols and have the capability and resources to administer a tranexamic acid infusion.


TACTICAL EMERGENCY CASUALTY CARE
DIRECT THREAT CARE – HOT ZONE
EMT
AEMT
PARAMEDIC
EVACUATE OR MOVE TO SAFE HAVEN IMMEDIATELY
IF UNABLE TO ESCAPE OR IF ENTRAPPED BY THREAT
DIRECT FIRST RESPONDER TO REMAIN ENGAGED IF POSSIBLE
MOVE PATIENT TO A SAFER POSITION AND TREAT THOSE WITH SURVIVABLE INJURIES
HEMORRHAGE CONTROL WITH TOURNIQUET OR DIRECT PRESSURE
POSITION PATIENT TO PROTECT AIRWAY
EXECUTE EVACUATION OR RESCUE PLAN WHEN ABLE


TACTICAL EMERGENCY CASUALTY CARE
INDIRECT THREAT CARE – WARM ZONE
EMT
AEMT
PARAMEDIC
REMOVE WEAPONS ON OR NEAR INJURED PERSON
CONTROL MAJOR BLEEDING WITH TOURNIQUETS AND/OR PRESSURE DRESSING (GAUZE OR HEMOSTATIC DRESSING) AND REASSESS PERIODICALLY
CLEAR MOUTH OF FOREIGN BODIES
OPEN AND MAINTAIN AIRWAY
PLACE IN RECOVERY POSITION IF POSSIBLE
CHIN LIFT/JAW THRUST
NASOPHARYNGEAL AIRWAY
EXTRAGLOTTIC AIRWAY*
ENDOTRACHEAL INTUBATION or
NEEDLE/SURGICAL CRICOTHYROTOMY
ADMINISTER OXYGEN IF AVAILABLE AND ASSESS CHEST AND CHEST WALL
OPEN/SUCKING WOUNDS
TENSION PNEUMOTHORAX
APPLY VENTED CHEST SEAL OR LEAVE OPEN
REMOVE OR VENT DRESSING/CHEST SEAL
DECOMPRESS WITH NEEDLE THORACOSTOMY
ESTABLISH IV/IO
IV FLUIDS TO SBP > 90-100 MM HG
CONSIDER TXA IF < 3 HOURS POST-INJURY
PREVENT HYPOTHERMIA
IF TBI, ELEVATE HEAD UNLESS HYPOTENSIVE
REASSESS PATIENT
PROVIDE ANALGESIA
SPLINT/STABILIZE FRACTURES PELVIC BINDER
TREAT BURNS
APPLY MONITORING DEVICES IF AVAILABLE (BP, PULSE OX, CARDIAC)
PREPARE PATIENT FOR MOVEMENT AND EVACUATION
DOCUMENT AND COMMUNICATE CARE PROVIDED AND FORWARD WITH PATIENT TO NEXT LEVEL OF CARE
CONSIDER BILATERAL NEEDLE DECOMPRESSION IN APNEIC OR PULSELESS PATIENT IF TENSION PNEUMOTHORAX IS SUSPECTED
* DO NOT PERFORM CPR IN A WARM ZONE


TACTICAL EMERGENCY CASUALTY CARE
EVACUATION CARE – COLD ZONE
EMT
AEMT
PARAMEDIC
REASSESS ALL INTERVENTIONS APPLIED IN PREVIOUS PHASES OF CARE
REASSESS FOR RESPIRATORY DECLINE AND PNEUMOTHORACES
APPLY OXYGEN IF AVAILABLE
APPLY APPROPRIATE SPINE CARE
REASSESS CHEST AND CHEST WALL
OPEN/SUCKING WOUNDS
TENSION PNEUMOTHORAX
APPLY VENTED CHEST SEAL
OR LEAVE OPEN
REMOVE OR VENT
DRESSING/CHEST SEAL
DECOMPRESS WITH NEEDLE
THORACOSTOMY
CONTROL MAJOR BLEEDING, REASSESS PRESSURE DRESSINGS AND TOURNIQUESTS
ASSESS NEED FOR TOURNIQUET RELOCATION, CONVERSION OR DOWNGRADE IF DELAY IN EVACUATION IS > 2 HOURS
ADMINISTER IV FLUIDS TO SBP > 90-100 MM HG
CONSIDER TXA
IF < 3 HOURS POST-INJURY
MAINTAIN INFUSION OF BLOOD/BLOOD PRODUCTS
INITIATED BY A NURSE OR PHYSICIAN
IF TBI, ELEVATE HEAD
UNLESS HYPOTENSIVE
PREVENT
HYPOTHERMIA
APPLY CARDIAC /VENTILATION MONITORS
(BLOOD PRESSURE, PULSE OX, END TIDAL CO_2)
REASSESS PATIENT
PROVIDE ANALGESIA
TREAT
BURNS
FOR TBI, ELEVATE HEAD
UNLESS HYPOTENSIVE
PREVENT HYPOTENSION
AND HYPOXIA (ESPECIALLY
FOR TBI)
PREPARE PATIENT FOR MOVEMENT AND EVACUATION
DOCUMENT AND COMMUNICATE CARE PROVIDED AND FORWARD WITH PATIENT TO NEXT LEVEL OF CARE
CONSIDER BILATERAL NEEDLE DECOMPRESSION IN APNEIC OR PULSELESS PATIENT
IF TENSION PNEUMOTHORAX IS SUSPECTED
DO NOT PERFORM CPR FOR VICTIMS OF BLAST, PENETRATING, OR BLUNT TRAUMA
CONSIDER CPR FOR PATIENTS WITH ELECTROCUTION, HYPOTHERMIA, NON-TRAUMA ARREST, OR NEAR DROWNING

The rescue task force (RTF) concept, which was pioneered by the Arlington County Fire Department in Arlington, Virginia, was generated by an identified need for EMS and law enforcement agencies to evolve their response to active shooter incidents. The Federal Bureau of Investigation's definition of an active shooter incident (ASI), which is applicable to all discussions about RTFs, is "an individual actively engaged in killing or attempting to kill people in a confined and populated area." In other words, the weapon involved in an ASI can be a firearm, vehicle, knife, bomb, or a toxic substance. The RTF concept and the role of a RTF are distinctly different from tactical EMS, and RTFs are definitely not meant or designed to replace tactical EMS units.

The RTF concept, paired with operational training and effective exercises and drills involving all RTF members, enables EMS to provide care for wounded victims while under the protection of armed law enforcement officers. Within a local community-initiated and based program, EMS and law enforcement agencies collaboratively develop or use the best available protocols, including patient care, to provide rapid treatment for casualties in an active shooter scenario. These protocols facilitate entry in to warm zones to expedite the rapid delivery of lifesaving patient care. In summary, the vision and goal of the RTF concept is mitigation of provider risk by using procedures, training, and protective equipment, while providing rapid stabilization, treatment, and evacuation of the wounded despite hazardous conditions that would otherwise delay treatment.

With regards to patient care delivery, many RTFs utilize a modified version of the Committee on Tactical Emergency Casualty Care patient care guidelines due to the minimal medical equipment that is traditionally carried by EMS provider members of an RTF and the lack of oxygen and other medications in their equipment bags. While the initial rapidly delivered life-saving treatment measures are provided to victims by the RTF, subsequent patient care is traditionally transferred to EMS providers who are trained in Tactical Emergency Casualty Care and other medical professionals positioned outside of the warm zone while the RTF remains on task within the warm zone.

As stated previously, the decision to create an RTF and its structural and operational design is made at the local or regional level with consideration to the resources available. While not mandatory, the following are the RTF goals and operational principles in the hot, warm, and cold zones during an ASI as cited by the Committee on Tactical Emergency Casualty Care. This is provided as a sample and is one of many available resources for EMS and law enforcement agencies considering adoption of the RTF concept and operational measures.

Direct Threat Care/Hot Zone

Primary Goals:

1. Accomplish the mission with minimal casualties.
2. Prevent any patient from sustaining additional injuries.
3. Keep operational response maximally engaged in addressing the immediate and any existing threats (e.g. fire/smoke, unexploded ordinance, active shooter, impending collapse).
4. Minimize public harm.

Operational Principles:

1. Establish *operational control of the immediate incident* and defer in-depth medical interventions if engaged in *ongoing direct threat mitigation* (e.g. active fire suppression, dynamic explosive scenario, etc.).
2. *Threat mitigation* techniques will minimize risk to casualties and the providers. These should include techniques and tools for rapid access to the patient and rapid patient egress.
3. Triage should be deferred to a later phase of care. Prioritization for extraction is based on resources available and the tactical situation.
4. Minimal trauma interventions are warranted in this phase of care.
5. *Consider* hemorrhage control before evacuation to a safer area.
   a. Tourniquet application is the primary "medical" intervention to be *considered* in this phase of care.

Indirect Threat Care/Warm Zone

Primary Goals:
1. Goals 1-4 as above with direct threat care/hot zone care
2. Stabilize the patient as required to permit safe evacuation to a dedicated treatment sector or medical evacuation assets.

Operational Principles:
1. Maintain *operational control* to stabilize the immediate scenario.
2. Conduct *dedicated patient assessment* and initiate appropriate life-saving interventions as outlined in the indirect threat care/warm zone guidelines.
   a. Do not delay patient extraction/evacuation for non-life-saving interventions.
3. *Consider* establishing a *patient/casualty collection point* if multiple patients are encountered or there is a large operational footprint.
4. Unless in a fixed patient collection point, triage in this phase of care should be limited to the following categories:
   a. Uninjured or minimally injured and capable of ambulation/self-extraction
   b. Deceased/expectant
   c. All others
5. Establish *communication* with unified command to inform of need for patient evacuation.
6. Prepare casualties for evacuation and document care rendered for continuity of care purposes.

Evacuation Care/Cold Zone

Primary Goals:
1. Maintain any lifesaving interventions conducted during direct threat/hot zone and indirect threat/warm zone phases of care
2. Provide rapid and secure evacuation to an appropriate (level of care) medical receiving facility.
3. Provide good communication and patient care data between field medical providers and fixed medical receiving facility.
4. Avoid additional preventable causes of death.

Operational Principles:
1. Reassess the patient or casualties for efficacy of all applied medical interventions.
2. Utilize a triage system/criteria per local policy that considers priority and destination to ensure proper distribution of patients.
3. Utilize available additional resources to maximize advanced care.
4. Avoid and/or address developing hypothermia.
5. Communication is critical, especially between different operational disciplines and with medical resources.
6. Maintain situational awareness: in dynamic events, there are no threat free areas.

CENTRAL LINE MONITORING

1. All fluids, medications, modified total parenteral nutrition (TPN), and hyperalimentation can be administered via central lines.

2. PICC lines (peripherally inserted central catheters) are considered central lines as the tip of the catheter is placed in the central circulation, often near or in the atrium of the heart.

3. Central sites should be monitored for bleeding, swelling, redness, pain or leaking of the infusing fluid. If any of these complications occur, the infusion should be discontinued immediately. Firm pressure should be applied on the entrance site if bleeding or fluid leakage persists.

4. Do not remove central venous catheters.

5. Common central venous sites include the internal jugular, subclavian, femoral, and antecubital veins.

6. Central catheters may have single or multiple lumens. Medications can be administered simultaneously using one continuous medication per lumen.

7. Swan-Ganz catheters are used to measure cardiac output and pulmonary artery and central venous pressure as well as to infuse fluids.
    a. Disconnect the Swan-Ganz catheter from the transducer.
    b. Continue fluid infusion through the catheter port or have the nurse close the port with a cap or heplock port.
    c. Have the nurse check the balloon port to insure that it is deflated.

CHEST DECOMPRESSION

GENERAL CONSIDERATIONS

The treatment of tension pneumothorax involves decompression of the affected chest cavity to release the pressure that has developed.

Decompression can be achieved, with minimal risk, by the insertion of a 14 or 16 gauge needle into the second inter-costal space at the midclavicular line. A longer needle (5 inches in length or greater) may be required to penetrate the thoracic cavity in obese patients. Also an approach in the mid-axillary line between the fifth and sixth rib is possible, and considered safer by some physicians.

The needle must be inserted superior to the rib because the intercostal artery, vein, and nerve follow the inferior portion of the rib.

INDICATIONS

Tension pneumothorax indicated by:

A. Diminished or absent lung sounds

B. Cyanosis and difficulty breathing

C. Distended neck veins

D. Tachycardia, tachypnea, hypotension, narrow pulse pressure

E. Tracheal shift to the unaffected side (May not always be present)

PROCEDURE

A. Prepare equipment: 14 or 16 gauge needle, antiseptic solution. An intravenous cannulation device in which a rigid needle is surrounded by a plastic catheter and they are inserted as a unit is preferred due to the fact that when the thoracic cavity is successfully entered and the rigid needle or stylet is removed, the catheter sheath provides one-way valve.

B. Locate site:

1. Second or third intercostal space at the midclavicular line

2. Fourth intercostal space between the fourth and fifth rib at the midaxillary line

C. Cleanse the insertion site, if time permits

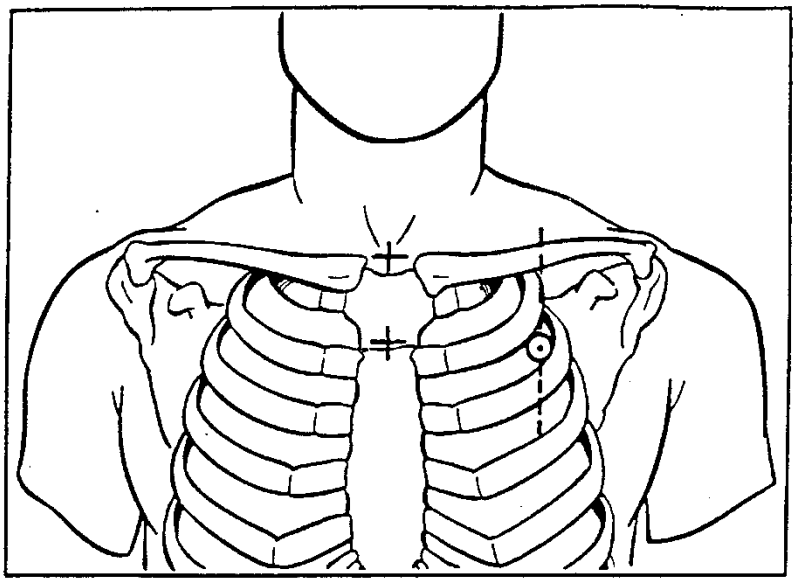
D. Insert the needle just superior to the rib until a rush of air is felt and/or heard

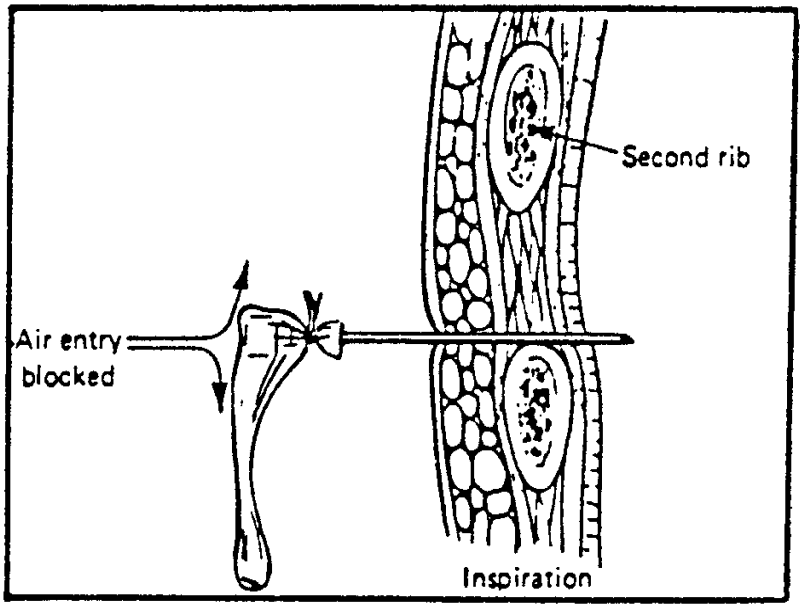
E. Secure needle in place

F. Support patient with 100% oxygen and transport without delay

CONTRAINDICATIONS

A. Insufficient training completed by the EMS provider.




Second rib
Air entry
blocked
Inspiration

Chest tubes, which drain intrathoracic air or fluid, are positioned in the fourth or fifth intercostal space at the mid-axillary line or the second or third intercostal space at the mid-clavicular line. They are secured with sutures and tape and the entrance site covered with a clean, sterile dressing.

Chest tubes are connected to suction via a drainage system. The transferring nurse should check the suction control and record its pressure on the transfer form. The collection chamber of the drainage system contains the intrathoracic fluid if present. The collection chamber should be emptied by the nurse prior to transfer. The water seal chamber of the drainage system prevents reentry of air or fluid into the intrathoracic space. Bubbles in the water may be seen and may vary with the patient's respirations. Chest tubes usually require 15 to 20 cm of H_2O pressure in the suction chamber to drain properly.

Prior to transfer of the patient, inspect for and remove all kinks and loops in the tubing. The connection between the chest tube and drainage system should be secure and taped. The drainage system is to be placed in the upright position below the level of the patient's chest.

If a chest tube comes out during transfer, treat the insertion site as a sucking chest wound. Cover the entrance site with a vented chest seal or an occlusive dressing, preferably Vaseline® gauze, on three sides of the site to avoid the creation of a tension pneumothorax. If Vaseline® gauze is unavailable, cover the entrance site on three sides of the site with sterile gauze and apply firm, continuous pressure with the hand.

Call medical direction immediately for:

- Deterioration of respiratory status
- Chest tube fluid drainage greater than 100 ml/hour
- New onset of bloody fluid drainage from chest tube

CONTINOUS POSITIVE AIRWAY PRESSURE (CPAP)

Continuous positive airway pressure (CPAP) has been shown to rapidly improve vital signs, gas exchange, the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in the patients who suffer from shortness of breath from congestive heart failure and acute cardiogenic pulmonary edema. CPAP is also shown to improve dyspnea associated with pneumonia, chronic obstructive pulmonary disease (asthma, bronchitis, emphysema). In patients with CHF, CPAP improves hemodynamics by reducing preload and afterload.

Indications:
Dyspnea and/or hypoxemia secondary to congestive heart failure, acute cardiogenic pulmonary edema, pneumonia, chronic obstructive pulmonary disease (asthma, bronchitis, emphysema) and:

A. Any patient who is complaining of shortness of breath for reasons other than pneumothorax or chest trauma
B. Is awake and oriented
C. Has the ability to maintain an open airway (GCS>10)
D. Has a respiratory rate greater than 25 breaths per minute
E. Has a systolic blood pressure above 90 mmHg
F. Uses accessory muscles during respirations

Contraindications:
1. Pneumothorax
2. Respiratory arrest
3. Agonal respirations
4. Unconscious
5. Shock associated with cardiac insufficiency
6. Penetrating chest trauma
7. Persistent nausea/vomiting
8. Facial anomalies
9. Stroke
10. Obtundation
11. Facial trauma
12. Has active upper GI bleeding or history of recent gastric surgery

Procedure:
1. Assess patient for signs / symptoms of pneumothorax
2. Place patient in a sitting position
3. Assess vital signs and SpO_2 frequently
4. AEMT and Paramedic: Attach ECG monitor
5. If the systolic BP is <90 mm Hg, contact medical direction prior to initiating CPAP
6. Begin at lowest level of positive pressure available
7. Explain the procedure to the patient:
    i. Patient requires reassurance to be used effectively.
        a. Example: “You are going to feel some pressure from the mask but this will help you breath easier.”
    ii. Place delivery device over mouth and nose.
    iii. Instruct patient to breath in through their nose slowly and exhale through their mouth as long as possible (count slowly and aloud to four then instruct to inhale slowly).
8. For CHF or pulmonary edema, titrate to 10 cm H_2O. For all other SOB, titrate to 5 cm H_2O
9. Check for air leaks
10. Treatment should be given continuously throughout transport to the emergency department.
11. Continue to coach patient to keep mask in place and readjust as needed

12. If respiratory status or level of consciousness deteriorates, remove device and begin bag valve mask ventilation.
13. Documentation on the patient care record should include:
    a. CPAP level
    b. Frequent SpO_2 and vital sign assessment
    c. Response to treatment
    d. Any adverse reactions

Special Notes:

1. CPAP should not be used in children under 12 years of age
2. Advise receiving hospital as soon as possible so they can prepare for the patient's arrival
3. Do not remove CPAP until transfer of care has taken place at receiving hospital
4. Continuous reassessment of patient airway

INDICATIONS

Unable to intubate by another route. This may be seen with:

A. Cervical spine injuries

B. Maxillofacial trauma

C. Laryngeal trauma

D. Oropharyngeal obstruction from:

1. Edema from infection, caustic ingestion, allergic reaction, and/or inhalation injuries
2. Foreign body
3. Mass lesion

E. Orotracheal or nasotracheal intubation is contraindicated for any reason

COMPLICATIONS

A. Postoperative bleeding

B. Late bleeding

C. Abscess behind packing

D. Cellulitis of neck

E. Subcutaneous emphysema

F. Voice change

G. Feeling of lump in throat

H. Persistent stoma

I. Obstructive problems

J. Misplacement of the airway

NEEDLE CRICOTHYROTOMY PROCEDURE

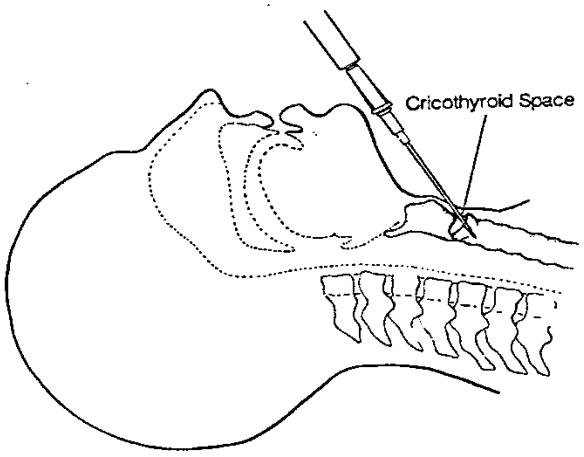
If time permits, prep the area with appropriate antiseptic solution. Attach a large angiocath (14-16 ga) to a syringe, and insert the needle through the cricothyroid membrane (CTM) and aspirate. Aspiration of air indicates proper placement.

If the intention is to use this as a temporary means of oxygenation then the catheter should then be slid into place.

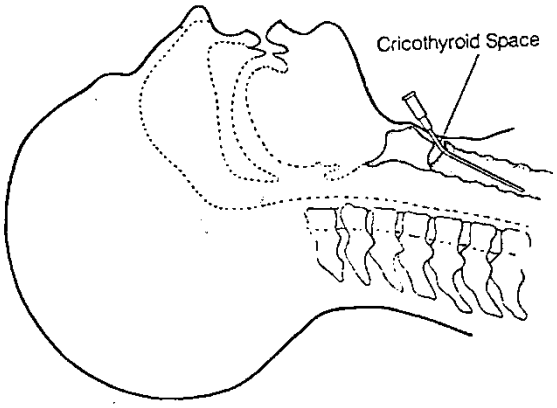
If the needle is going to be used as a guide for formal cricothyrotomy then the catheter should not be used in order to prevent the possibility of shearing off the catheter when the scalpel is used.

A jet ventilator should be used to provide sufficient volume of oxygen at a pressure of no more than 30 psi.

Needle cricothyrotomy is the preferred method in children less than 11 years of age.



14 Gauge Catheter Insertion



SURGICAL CRICOTHYROTOMY PROCEDURE

Make a 2 to 4 cm vertical skin incision over cricothyroid membrane. Once the membrane has been exposed, make a 1.5 to 2 cm horizontal incision into the membrane and through to the trachea. Maintain a slight caudal direction, with the blade, to avoid damage to vocal cords.

Use forceps or dilator to spread the aperture in the cricothyroid membrane. Again, caution against vocal cord injury by angling instruments caudally.

If time does not allow or equipment is not available, the blunt end of the scalpel can be placed in the incision and twisted to open the aperture.

Insert an appropriate size endotracheal tube (6 cm tube). Advance caudally and inflate balloon. When the tube is in place, check breath sounds and secure the tube.

ENDOTRACHEAL INTUBATION

INDICATION

Endotracheal intubation is to be utilized for any victim with respiratory arrest and/or insufficiency to achieve complete control over the airway. It protects the airway from aspiration of foreign material and it allows for intermittent positive pressure ventilation to be achieved with 100% oxygen. It makes the trachea and the respiratory tract available for suctioning, and also eliminates the problem of gastric distention.
NOTE: Orotracheal intubation is outside of the Ohio EMS scope of practice for EMTs although the insertion of dual lumen or extraglottic airways in is permitted in patients who are apneic and pulseless.

HAZARDS

A. Esophageal intubation

B. Tracheal rupture

C. Right mainstem bronchus intubation

D. Broken teeth

E. Laryngospasms

F. Trauma to the oropharynx

G. Trauma or puncture of trachea due to misplacement of stylet

H. Hypotension

I. Peri-intubation hypoxia

J. Patient decompensation/deterioration

OROTRACHEAL INTUBATION

A. Always begin artificial ventilation as soon as possible using a bag-valve-mask or oxygen powered manually triggered or automatic transport ventilation device.

B. Assemble and ready equipment:

1. Endotracheal tubes of various sizes
2. Laryngoscope and blades
3. Malleable stylet
4. Magill forceps
5. 10 ml syringe
6. Suction apparatus and catheters
7. Water soluble lubricant
8. ET tube tape
9. Oropharyngeal airway

C. After the proper size endotracheal tube is selected, check the cuff for leaks and lubricate tube. Insert a stylet into the tube if it anticipated to be necessary.

D. Assemble laryngoscope and check bulb

E. Put patient's head in sniffing position. Although this is the preferred position for most intubations, the ideal position of the head may be affected by trauma, obesity, or the patient's age. Do not allow the head to hang over the end of the table or bed. The occiput of the head should be on the same horizontal plane as the back of the shoulders, with the neck somewhat elevated.

F. While holding the laryngoscope in the left hand, insert the blade in a manner to move the tongue and epiglottis superiorly, and visualize the glottis opening

G. Suction the mouth and the pharynx

H. Visualize the epiglottis and vocal cords

I. Insert the endotracheal tube with the right hand, starting at the corner of the mouth down into the trachea, and past the vocal cords approximately 2 inches

J. Remove laryngoscope and stylet (if used), holding the tube securely with the right hand

K. Attempt to ventilate with a bag-valve-mask and check for breath sounds in both lungs

L. If breath sounds are heard, inflate the tube's cuff with 4-6 ml of air and secure the tube in place with an oropharyngeal airway used as a bite block. Confirm tube placement with end tidal CO_2 assessment and initiative waveform capnography.

M. Maintain ventilation until adequate respirations resume or victim is delivered to an emergency department

N. Recheck lungs sounds and verify tube placement each time patient is moved or every 10 minutes

O. Document the intubation by noting the following:
1. Number of attempts to achieve successful intubation
2. Person(s) making attempts
3. Size of tube used
4. Type of laryngoscope blade used on each attempt
5. Lung sounds before intubation
6. Lung sounds after intubation and time of each check
7. Measurement on tube at lips of patient when lung sounds are present
8. Any complications
9. End tidal CO_2, digital capnometry measurement, and/or waveform capnography
10. Pulse oximetry
11. Post-intubation vital signs

TUBE REMOVAL

If the patient begins to breathe spontaneously and effectively and is resisting the presence of the tube, removal of the tube may be necessary. A patient who is intubated prior to confirmation of DNR orders may also benefit from removal of the tube if deemed appropriate by medical direction. When a tube removal is planned, the following procedures should be followed:

A. Explain the procedure to victim

B. Prepare suction equipment with large-bore catheter and suction secretions from endotracheal tube, mouth, and pharynx

C. The lungs should be completely inflated so that the patient will initially cough or exhale as the tube is taken from the larynx. This is accomplished in one of two ways:

1. The patient is asked to take the deepest breath they possibly can and, at the very peak of the inspiratory effort, the cuff is deflated, and the tube removed rapidly; *or*

2. Positive pressure is administered with a hand-held ventilator and, at the end of deep inspiration, the cuff deflated, and the tube rapidly removed

D. Prepare to suction secretions and gastric content if vomiting occurs

E. Appropriate oxygen is then administered

F. The patient's airway is immediately evaluated for signs of obstruction, stridor, or difficulty breathing. The patient should be encouraged to take deep breaths and to cough.

G. The patient is not to be left unattended until there is no doubt of their ability to function without the artificial airway.

TUBE SIZING

The size of tube that can be passed easily into most adults is 8.0 mm (id). However, women and smaller adults often require a 7.5 mm or 7.0 mm (id or internal diameter) tube. The appropriate size of the tube should be estimated by the size of the adult rather than the patient's age.

For the pediatric population, the proper tube can be estimated as being equal to the circumferential size of the child's little finger. The following guide will also help in determining the proper size tube:

Age	Size (mm) – Uncuffed	Size (mm) – Cuffed
Premature	2.5	
Term to 3 months	3.0	
3-7 months	3.5	3.0
7-15 months	4.0	3.5
15-24 months	4.5	3.5
2-15 years	[age(yr)/4]+4	[age(yr)/4]+3.5

All the above tube sizes are still dependent on the child's size in consideration of age.

ADMINISTRATION OF MEDICATION THROUGH ENDOTRACHEAL TUBE

In the event an intravenous or intraosseous route for administration of medication cannot be established, but an endotracheal tube (ETT) has been properly put in place, medications such as naloxone (Narcan®), atropine, epinephrine, and lidocaine can effectively be administered through the tube.

EMS professionals, per this guideline, administer the medication via the lumen of the ETT. ETTs with an integral injection port that delivers the medication to the distal end of the tube are preferred as they allow the care providers to administer medications without interrupting CPR or disconnecting the ETT from the BVM. For medications that are delivered via a catheter that is inserted into the lumen of the ETT, the catheter should be passed beyond the tip of the endotracheal tube, compressions stopped, and the medication sprayed quickly into the lower airway.

Medications should be administered at two (2) times the IV dosage and diluted with 10 ml of saline or sterile water before administration.

If ETTs without integral injection ports are used or when medication injection catheters are not available, the following procedure should be followed:

1. Remove needle from syringe
2. Make sure ETT and airway are clear of mucous
3. Disconnect ventilation device from tube and squirt medication rapidly into tube
4. Reconnect ventilation device and adequately ventilate the patient to assure passage of medication down the tube and into the airway
5. Do not take longer than 15 seconds to administer medication in order to prevent hypoxia of the patient.

In order to assure placement of the ET tube into the trachea after intubation, end tidal CO_2 assessment is highly suggested as auscultation of the patient's breath sounds alone can be unreliable. End tidal CO_2 assessment can be achieved through the use of waveform capnography, which is highly preferred, after each intubation attempt or, as secondary options, digital capnometry or an end tidal CO_2 detector.

NOTE: On December 17, 2014, the State of Ohio Emergency Medical, Fire, and Transportation Services Board approved the mandatory utilization of waveform capnography for all patients requiring invasive airway devices effective **January 1, 2021** as continuous quantitative patient monitoring of end tidal CO_2 is preferred.

ASSESSMENT OF VENTILATION AND PERFUSION WITH END TIDAL CO_2

Ventilation is the exchange of inhaled and exhaled gases during the inhalation and exhalation phases of respirations. Inhaled oxygen enters the lungs, is delivered to the hemoglobin in the blood, and is delivered and released to organs and tissues in the body. Exhaled gases contain carbon dioxide that is delivered to the lungs by the venous system in the body. The foundation of normal ventilation is based upon normal oxygen and carbon dioxide exchange. Inadequate ventilation can be the first sign of impending respiratory failure or respiratory arrest. Hypocarbia is a low concentration of carbon dioxide in the blood stream, and hypercarbia is a high concentration of carbon dioxide. Hypoxia, hypocarbia, or hypercarbia are signs of inadequate ventilation.

Perfusion is the delivery of oxygen via the blood to tissues in the body. Decreased blood delivery to the organs in the body or delivery of blood that contains insufficient oxygen results in poor perfusion. EMS providers assess a patient's perfusion and circulatory status by measurement of the blood pressure, assessing the strength and the location the pulse, or assessing the capillary refill.

Multiple studies have demonstrated that capnography and capnometry are superior methods of assessing a patient's ventilatory and circulatory status compared to pulse oximetry. Capnography and capnometry allow the EMS professional to measure and monitor a patient's concentration or partial pressure of end tidal carbon dioxide (P_{ETCO2}). In addition to its use in the post-arrest patient, the continuous monitoring of end tidal carbon dioxide, i.e. waveform capnography, facilitates early detection of displaced ETTs and allows the EMS professional to detect hypoventilation and/or hypercarbia.

Although quantitative capnometry is acceptable, waveform capnography is the gold standard for the use of end tidal CO_2 assessment to determine the ventilator and circulatory status in intubated patients. EMS professionals should apply and utilize capnography and capnometry devices according to the manufacturer's recommendations.

NOTE: Effective January 1, 2021, the utilization of waveform capnography is mandatory for all patients requiring invasive airway devices with the exception of stable patients with no cardiac or pulmonary complaints or symptoms unless ordered by the transferring physician. An invasive airway device is any device that is inserted or pre-positioned into a patient's airway by means of the mouth, directly into the trachea, or into the trachea by means of a tracheostomy tube, cricothyrotomy, or nasotracheal intubation. Dual lumen and extraglottic airways, even though they are blindly inserted into the hypopharynx or esophagus, are considered invasive airway devices.

In the interest of patient safety, the State of Ohio Emergency Medical, Fire, and Transportation Services (EMFTS) Board highly recommends the utilization of digital capnometry or waveform capnography as an assessment tool for all patients who require oxygen via any non-invasive route of administration.

WAVEFORM CAPNOGRAPHY

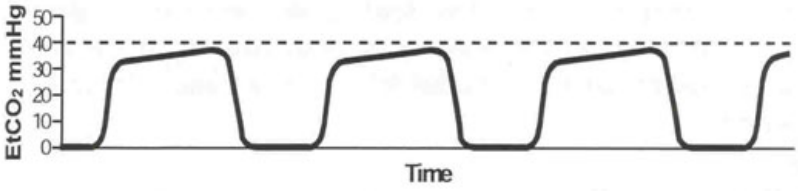
Waveform capnography provides continuous numeric measurement of CO_2 levels during both the inhalation and exhalation phases of respiration. Waveform capnography also has the benefit of providing a graphic image of the level and pattern of carbon dioxide exchange.

The normal range for partial pressure or measurement of end tidal CO_2 is 35 to 45 millimeters of mercury. While the normal range for a patient's pulse rate or respiratory rate is age-dependent, the normal range of end tidal CO_2 applies to all age groups. An end tidal CO_2 reading in the normal range, paired with the EMS provider's clinical assessment, may indicate that the patient has normal cardiac or pulmonary function. For those patients with an invasive airway device in place, an end tidal CO_2 reading in the normal range is one of the indicators that the device is properly placed. In patients where the end tidal CO_2 is rising or is above 45 millimeters of mercury, this may be the first indication of hypoventilation or impending respiratory failure. In patients who are in cardiac arrest, a sudden rise in the end tidal CO_2 to a level greater than 30 millimeters of mercury may indicate the return of spontaneous circulation.

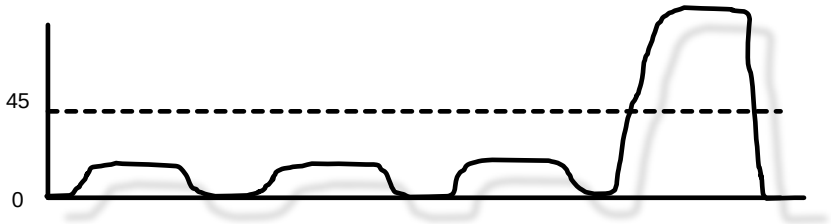
The waveform capnograph, which is the actual digital or printed image generated by the device, provides several elements of information. First, the respiratory rate can be seen on the horizontal axis of the graph. The vertical axis of the graph is the level of the end tidal CO_2 during the entire respiratory cycle which is comprised of

inhalation and expiration. The exchange of oxygen and carbon dioxide during the respiratory cycle is dynamic and constantly changing. The morphology, which is the shape, of the capnograph tracing obtained during continuous patient monitoring will display many of the changes that are occurring during respiration. Formal training in the application of waveform capnography and the interpretation of a capnography should be provided to all EMS providers who are authorized by their EMS medical director to place an invasive airway device. At a minimum, EMS providers should be able to interpret and recognize the morphologies of a waveform that are indicative of normal ventilation, the return of spontaneous circulation during resuscitation from a cardiac arrest, hypoventilation, and loss of ventilation and/or perfusion due to various causes including, but not limited to, a misplaced airway device.

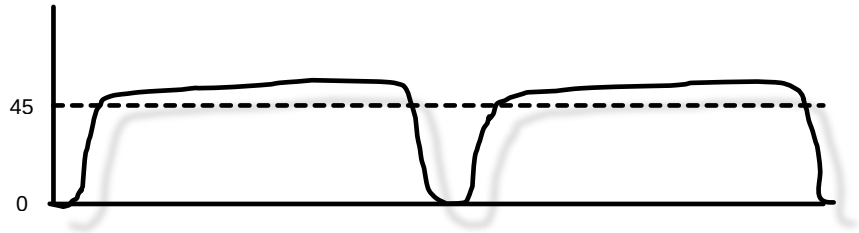
This is an example of the morphology seen on a capnograph from a patient with a normal ventilation and perfusion status.



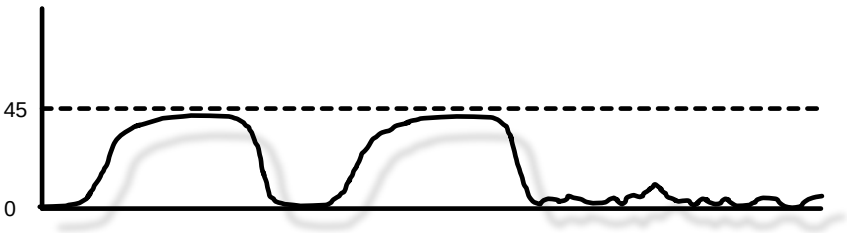
This is an example of the morphology seen on a capnograph when there is return of spontaneous circulation following a cardiac arrest.



This is an example of the morphology seen on a capnography when a patient is a state of hypoventilation. Hypoventilation with hypercarbia can lead to respiratory failure or arrest.



This is an example of the morphology seen on a capnograph when an invasive airway device is disconnected, displaced, kinked, or obstructed or when there is a loss of circulatory function.



DIGITAL CAPNOMETRY

Digital capnometers use technology similar to pulse oximeters where a sensor placed on a finger, toe, or earlobe analyzes the capillary blood flow. The capnometer provides a numeric measurement of the amount of carbon dioxide in the blood. Similar to a pulse oximeter, a digital capnometer can continuously measure a patient's CO_2 over time, but it does not provide a graphic image or recording of the patient's pattern and quality of ventilation or perfusion. An EMS provider will be able to detect that a patient's level of CO_2 is increasing or decreasing, but the numeric reading will not assist the EMS provider in determining why this is happening. Like a pulse oximeter, the information provided by a digital capnometer is valuable, but it is not capable of providing sufficient information to maximize the monitoring of critically ill patients that require invasive airway intervention.

The normal range for partial pressure or measurement of end tidal CO_2 is 35 to 45 millimeters of mercury. While the normal range for a patient's pulse rate or respiratory rate is age-dependent, the normal range of end tidal CO_2 applies to all age groups. An end tidal CO_2 reading in the normal range, paired with the EMS provider's clinical assessment, may indicate that the patient has normal cardiac or pulmonary function. In patients where the end tidal CO_2 is rising or is above 45 millimeters of mercury, this may be the first indication of hypoventilation or impending respiratory failure. In patients who are in cardiac arrest, a sudden rise in the end tidal CO_2 to a level greater than 30 millimeters of mercury may indicate the return of spontaneous circulation. **For those patients with an invasive airway device in place, the application of waveform capnography is required to assist in the confirmation of proper device placement and to conduct continuous monitoring during ventilation.**

COLORIMETRIC END TIDAL CO_2 DETECTION

Colorimetric end tidal carbon dioxide detectors are devices that are placed in line between an invasive airway device and a bag valve mask. There is a pH-sensitive paper inside the device that changes color (typically from yellow to purple) when it is exposed to gases containing a significant amount of carbon dioxide. The measurement is qualitative. That is, carbon dioxide is either present in significant amounts if the color changes or it is not if the color remains unchanged. The color changes occur cyclically with each ventilatory cycle. Although colorimetric end tidal CO_2 detectors are inexpensive, moisture inactivates the pH-sensitive paper making their use potentially limited for prolonged use or patient reassessment during longer transports. In addition, the paper can lose its ability to change color if the packaging of the device has been unsealed for a prolonged length of time. As these devices are not capable in providing a numeric or quantitative measurement of CO_2, they can be inaccurate during the assessment of patients in the post-cardiac arrest period or in patients with poor perfusion.

Procedure for use:

A. Remove the end tidal CO_2 detector from package (Do not remove end caps until ready to use device)

B. Remove end caps immediately before use and shake device to introduce room air

C. Match initial color of the indicator to the purple color labeled "CHECK" on the product dome. If the purple indicator color is not the same or darker, do not use.

D. Insert endotracheal tube (Inflate cuff if tube is equipped with one)

E. Firmly attach the end tidal CO_2 detector between the endotracheal tube and the breathing device

F. Ventilate patient with six breaths of moderate tidal volume (may be done quickly). Interpreting the result with less than six breaths can yield false results.

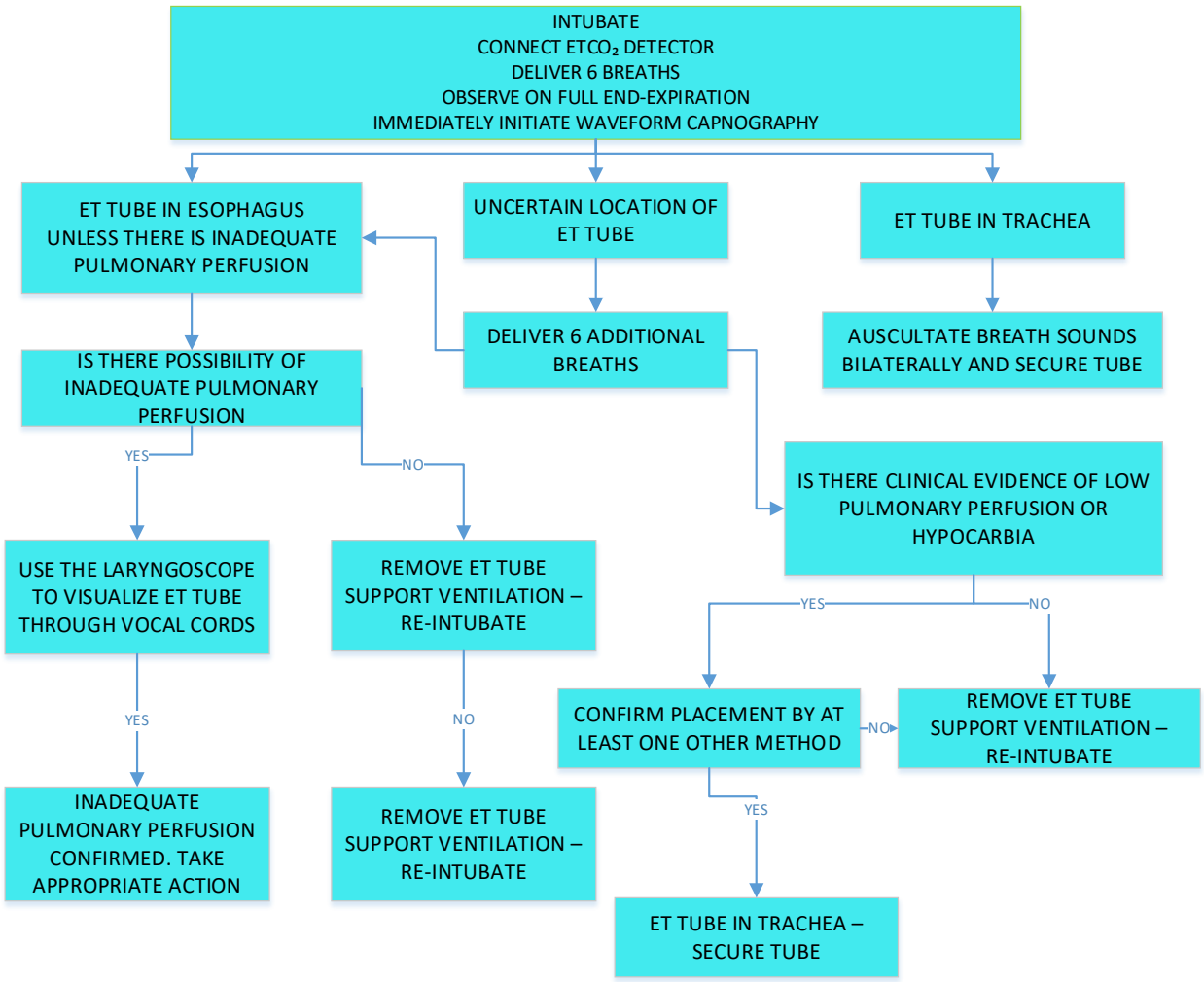
G. Compare the color of the indicator on full end-expiration to the color chart on the product dome.

H. If initial intubation attempts fail, the end tidal CO_2 detector can be used for re-intubation on the same patient provided that the indicator color still matches the “CHECK” color standard on the product dome.

I. **The end tidal CO2 detector must be immediately replaced with application of waveform capnography to assist in the monitoring tube placement during ventilation**. The color indicator of an end tidal CO2 detector may become inaccurate due to moisture from prolonged use, gastric contents, or airway secretions. As such, waveform capnography is required.

J. This device is not to be used for:

1. Detection of hypercarbia
2. Detection of mainstem bronchial intubation
3. During mouth-to-tube ventilations



EXTERNAL PACEMAKER

INDICATIONS

An external pacemaker may be used in the following situations:

A. Bradycardia: External pacemakers are indicated as first line therapy associated with second degree heart block Mobitz II and third degree heart block when a pulse is present. External pacing may also be indicated for the treatment of symptomatic bradycardia or junctional and/or escape rhythms at a rate less than 60 beats per minute unresponsive to atropine. Symptoms may include chest pain, shortness of breath, hypotension, syncope, or altered mental status.

B. External pacing is not effective for asystole or pulseless electrical activity that is bradycardic in any situation and should not be used to treat asystole or pulseless electrical activity. Specifically, do not delay other therapies such as airway control, medication and CPR to institute external pacing.

C. Additional patients at the discretion of the on-line medical direction physician

APPLICATION

After connecting the pacing electrodes and cables, set the rate at 70 beats per minute and current at 20 milliamperes initially. Increase the amperage by 20 milliamperes every 10 seconds till capture is obtained.

NOTE: Electrical capture is indicated by a response, which is an increase in pulse rate in the treatment of bradycardia, that is demonstrated on the cardiac monitor or defibrillator. Mechanical capture is achieved with the patient has a detectable or palpable pulse associated with the complex of electrical capture demonstrated on the cardiac monitor.

Once electrical capture is achieved, check for mechanical capture, i.e. the presence of a pulse.

If capture occurs, reassess peripheral pulses and vital signs.

On-line medical consultation is indicated for all pediatric patients prior to using an external pacemaker.

Remove nitroglycerin patches and other transdermal patches or pads prior to using an external pacemaker.

Consider providing sedation to fully conscious patients prior to pacing

Patients who are initially unconscious may require sedation after treatment due to improving mental status.

Do not discontinue pacing if the patient complains of pain if this treatment is necessary for stability.

IV PROCEDURES

GENERAL CONSIDERATIONS

IVs will be started by the advanced emergency medical technician and/or the Paramedic as indicated by each patient care guideline.

IV placement must not delay transport of any critical patient.

Generally, no more than two (2) attempts or more than five minutes should be spent attempting an IV.

For critical patients, the placement of an IO is often more appropriate that placement of a peripheral IV. .

IVs may be started on patients of any age providing there are adequate veins and patient's condition warrants an IV.

Blood draws for hospital laboratory testing will not be required under this guideline.

IV SOLUTION

Normal saline (0.9% sodium chloride) is the preferred fluid in the prehospital setting although EMS medical directors may elect to use other IV solutions. Normal saline is provided in 250 ml bags and 3 ml syringes for IVs at a TKO or slow infusion rate and 1000 ml bag for fluid replacement.

Lactated Ringer's solution is an acceptable alternative if normal saline is not available.

Normal saline is to be infused as directed by specific treatment guidelines.

IV TUBING

The following tubing will be used for this guideline:

A. For all adult fluid lines, use regular administration set (15 gtt/min) tubing.

B. For child and infant patients, use 15 gtt/min set with 3-way stopcock and extension tubing.

C. For all patients needing TKO lines, use extension tubing with pre-pierced adapter as saline lock.

MECHANICS FOR STARTING PERIPHERAL IV

A. Prepare equipment

B. The initial attempt should be at a site on the extremity as distal as practical

C. Apply tourniquet

D. Cleanse site with the appropriate antiseptic

E. Attach IV tubing

F. Secure IV using appropriate measure to insure stability of the line

G. Check for signs of infiltration

H. Adjust flow rate

I. Document IV procedure on run sheet.

MECHANICS FOR STARTING EXTERNAL JUGULAR IV LINE

A. Locate external jugular vein

B. Cleanse site with the appropriate antiseptic

C. Select IV catheter

D. Position yourself at patient's head

E. Turn patient's head so as to maximally expose vein and minimize interference of jaw

F. Cannulate the vein by directing the needle caudal at an angle nearly parallel to the neck

G. Attach IV tubing

H. Secure IV using appropriate measures to insure stability of the line

I. Check for signs of infiltration

J. Adjust flow rate

K. Document IV procedure on run sheet.

MECHANICS OF STARTING SALINE LOCK

A. Prepare equipment: Attach pre-pierced adapter to extension tubing, Inject saline (approx. 1 ml) in to tubing and leave syringe attached to tubing

B. The initial attempt should be on the extremity distal as practical

C. Apply tourniquet

J. Cleanse site with the appropriate antiseptic

E. Attach IV tubing and push the remaining saline through the tubing and catheter. Remove syringe.

F. Secure IV using appropriate measure to insure stability of the line

G. Check for signs of infiltration

H. Document IV procedure on run sheet.

DOCUMENTATION

ALL IV attempts must be recorded on run sheet and include the following:

A. When successful:

i. Time IV was started
ii. Type and amount of solution hung and infused during run
iii. Flow rate
iv. Size of catheter or needle used
v. Location of IV site
vi. Initials of all EMS professionals who attempted and/or started IV
vii. Signature of EMS professionals in-charge of run

B. When unsuccessful:

i. Time IV was attempted
ii. Type of solution
iii. Size of catheter or needle used
iv. Location of attempted site
v. Initials of all EMS professionals who attempted and/or started IV
vi. Signature of EMS professionals in-charge of run

C. Record all IV medications given

i. Name of medication
ii. Dosage and amount given
iii. Time ordered (if applicable)
iv. Time given
v. Initial of all EMS professionals who administered medication
vi. Signature of EMS professionals in-charge of run

INTRAOSSEOUS INFUSION

INDICATIONS

A. To establish parenteral means to administer fluids, blood products and parenteral medications, and to draw blood (except for CBCs)

B. May be used in any instance that an IV route would be appropriate

C. Its use should be considered after two IV attempts have failed or if no peripheral IV sites are found

D. This procedure is indicated primarily in children

CONTRAINDICATIONS

A. Osteomyelitis or cellulitis over the proposed site

B. Fracture at or above the proposed site

C. Previous IO attempt at the proposed site

EQUIPMENT

A. 16ga intraosseous Needle

B. Betadine® (iodine solution) and alcohol *or* appropriate antiseptic

C. IV setup

D. Syringe for aspiration

E. Lidocaine as needed

PROCEDURE

A. Prepare as for a surgical procedure, using sterile technique

B. Attempt to have feet in flexed position against board or sandbag

C. If the patient is alert, consider using a local anesthetic

D. The preferred site is the proximal anteromedial tibia, 1-3 cm below the tibial tuberosity
Secondary sites include the proximal humerus 1 cm superior to the surgical neck with the needle inserted at a 45° angle or the midline of the distal femur 3 cm above condyle

K. Needle insertion into the tibia varies between seventy and ninety degree angle to the skin surface, approximately one to two finger breadths distal to the tibial tuberosity. With a straight steady push and/or rotary motion or using a drill, advance the needle through subcutaneous tissue and bone until a drop or pop is felt.

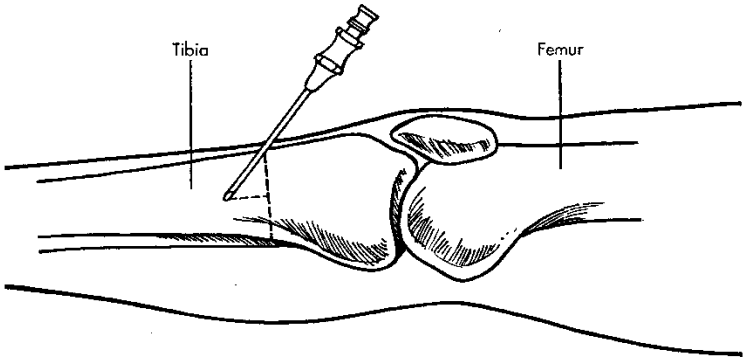
F. Once the needle has reached the bone marrow, saline should be injected via syringe to clear needle and then aspiration should be attempted. The infusion should flow freely without evidence of subcutaneous infiltration.

G. The needle should feel firm in position and stand upright without support.

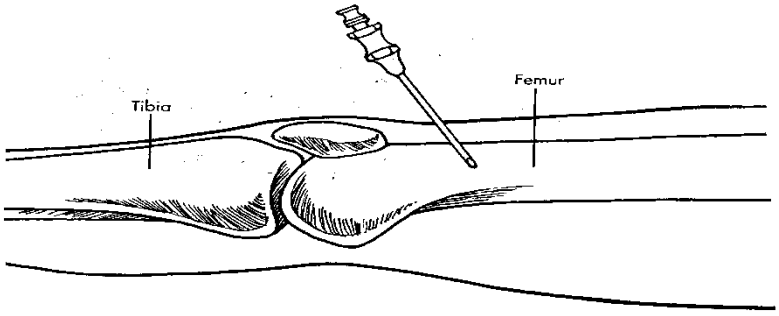
H. Infusion via this route is the same as venous access without limit to rate of administration, drugs pushed or fluid type infused.

I. After removing needle (for successful or unsuccessful attempt), apply pressure to area for five minutes and apply dressing to area.

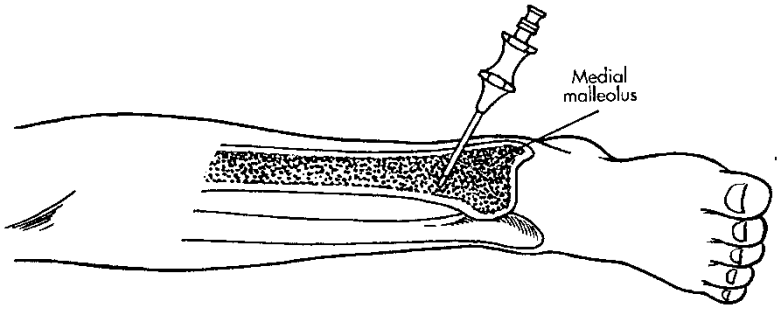
J. Intraosseous infusions of fluid may cause subcutaneous infiltration, osteomyelitis or subcutaneous infections.



Proximal tibial site for intraosseous infusion.



Distal femur site for intraosseous infusion.



Distal tibial site for intraosseous infusion.

Blood products may be infusing into patients that require interfacility transport. Blood contains hemoglobin, the protein that carries oxygen to the vital organs and tissues of the body. Blood administration is indicated for hypovolemic shock that is unresponsive to crystalloid fluid bolus or when the estimated blood loss is obviously significant. The packed red blood cells that are most commonly available in the hospital setting has all of the other elements (plasma, serum antibodies, platelets, etc.) separated and removed.

The prehospital care provider must be able to recognize the clinical complications that may occur with blood administration. Blood is typically classified using two major blood groups systems, the ABO system and the Rh system. The classifications are based upon antigens and antibodies present in blood on a genetic level.

The ABO system includes four blood groups: A, B, AB, and O. The letter classification describes the presence of a genetic antigen present on the **red blood cell**. Antibodies to the other genetic antigens are present in the **serum**. Antibodies will destroy incompatible antigens. In other words, antibodies will destroy a red blood cell that has a conflicting antigen.

For example, a person with group A blood will have serum antibodies that destroy the B antigen. If a person with group A blood receives group B or AB blood, the anti-B serum antibodies will attack and destroy the group B or AB red blood cell causing a massive intravascular hemolysis (transfusion reaction). Therefore, a person with group A blood should never receive group B or AB blood.

Group O red blood cells are the only blood group that has no antigens**.** A person with group O blood has anti-A and anti-B serum antibodies in the serum. A person with group O blood will have a transfusion reaction if they receive group A, B, or AB blood. Individuals with group A, B, or AB blood can receive group O blood because it there are no antigens on the group O red blood cell.

Packed red blood cells are gathered by taking whole blood and removing all other blood components, including serum and the antibodies they contain. Group O packed red blood cells are inherently antigen-free and have all serum antibodies removed.

The Rh system is based on the presence or absence of the D (Rh) antigen. The red blood cells of the majority of the population have the D antigen and are classified as Rh-positive. Individuals who lack the D (Rh) antigen on the red blood cell are classified as Rh-negative.

Patients with Rh-negative blood will develop antibodies against the Rh-positive antigen if they receive Rh-positive blood. Once the antibodies against the Rh-positive antigen are formed, the patient with Rh-negative blood will develop a severe transfusion reaction and hemolytic anemia if they receive Rh-positive blood again. A small amount of exposure to Rh-positive blood is required to form antibodies in the serum of an Rh-negative patient. The small amount of placental blood exchange during the delivery of a baby places the Rh-negative mother at risk for having a “blue baby” if the subsequent fetus is Rh-positive.

Blood type is described by stating the ABO group and the Rh group, i.e. A-positive, AB-negative. The blood type of packed red blood cells which is essentially free of major antigens is O-negative. Thus, O-negative is considered the “universal donor” as all patients may receive this blood type with minimal chance of a transfusion reaction.

Packed red blood cells from the blood bank are stored under refrigeration and have a blood bank tag attached to the fluid bag. There are blood bank identification numbers on the blood bank tag as well as the requisition sheet accompanying the fluid bag. The nursing staff will check the identification numbers to insure that the numbers on the blood bag correspond to the numbers on the requisition sheet. They will document these identification numbers on the patient's record. The prehospital care provider should confirm that the blood bank identification numbers are included in the copies of the chart that accompanies the patient before the interfacility transfer is initiated.

Blood should be administered through an IV catheter that is 20 gauge or larger. The intravenous access for blood administration must be a dedicated IV line through which no other medication or solution other than normal saline may be infused. If medications have been administered through an IV, the IV should be flushed well prior to the initiation of the blood administration.

The patient should be constantly observed for clinical signs of a transfusion reaction or intravascular hemolysis. A transfusion reaction will occur is the patient's serum contains antibodies against an antigen in the transfused blood. Administration of type O-negative blood significantly reduces the risk of this event; however, there are several less significant blood types and antigen classifications genetically present in blood that can generate an adverse reaction. Also, if the patient has had a prior remote blood transfusion, antibodies against the more minor blood antigens are more likely to be present in the patient's serum.

Symptoms of a transfusion reaction include nausea, flushing of the skin, chest and/or lumbar pain, anxiety, restlessness, tachypnea, tachycardia, and dark or bloody urine. If a patient develops a transfusion reaction, the blood administration should be terminated and medical direction should be notified **immediately.** The remaining packed blood cells should be secured and transported with the patient for further investigation. Documentation of the onset of symptoms, vital signs, and the blood bank identification numbers on the prehospital care report is imperative. Maintenance of kidney function after a transfusion reaction is imperative. Crystalloid fluids should be given liberally to maintain an adequate urine output.

NITRONOX®
(Nitrous Oxide - Oxygen Administration)

Nitronox® is a self-administered analgesic gas containing a mixture of 50% oxygen and 50% nitrous oxide. Nitronox® is supplied in a carrying case containing two cylinders; one of nitrous oxide and one containing oxygen, with a mixing valve and supply tubing. These agents are mixed on administration to deliver a 50% concentration of each to the patient. Negative pressure is required to open the valve, so the patient must have an airtight seal at the face mask.

INDICATIONS

Nitronox® should be given to any patient who is alert and complaining of severe pain.

Examples:
- Abdominal pain
- Chest pain secondary to infarction or angina
- Acute urinary retention
- Fractures
- Severe burns
- Kidney stones
- Musculoskeletal trauma

CONTRAINDICATIONS

Nitronox® is not to be used in patients with these conditions:

- Altered level of consciousness
- Head injuries
- Chest injuries (blunt or penetrating)
- Intoxication
- Maxillofacial injuries
- Psychiatric problems
- COPD (because of the 50% oxygen mixture)
- Pediatric patients under 12 years of age
- Pregnancy
- Respiratory distress

APPLICATION

A. Instruct patients to administer Nitronox® to themselves by placing the mask tightly against their face and breathing deeply and slowly

B. Allow mask to fall away from face spontaneously when effects are felt

C. Check the patient's blood pressure since Nitronox® may cause the blood pressure to decrease in some cases

SPECIAL CONSIDERATIONS

A. Nitronox® should never be administered by the EMT, AEMT, or Paramedic. Only self-administration by the patient is the only method in which it should be provided.

B. Upon administration of Nitronox®, constantly monitor patient to see he does not fall asleep with mask in place.

C. The side effects of nitrous oxide, in addition to analgesia, include light-headedness, drowsiness, and very occasionally, nausea and vomiting. Changes in heart rate and respiratory rate are minimal.

D. Nitrous oxide and oxygen are both non-flammable gases; however, both support combustion. For this reason do not use Nitronox® in areas where a combustion hazard is present or in the vicinity.

E. SPECIAL NOTE TO EMTS, AEMTS, AND PARAMEDICS:

There is an increased risk of liver cancer and birth defects to individuals who are exposed to repeated applications of nitrous oxide. For this reason, Nitronox® should be used in a well-ventilated environment.

SAFETY ISSUES

A. The Nitronox® unit must be stored in the EMS vehicle with its gas cylinders in an "OFF" position when not in use

B. The unit must not be used in any environment where:

1. There are possible ignition sources

2. Other patients are in close proximity (less than 10 feet away)

3. The room is small and no nitrous oxide alarm is monitoring the gas concentration in ambient air

C. The unit should not be used if the mixture pressure is not in the 30-35 PSI range

D. Any problem with the mechanical status of the apparatus shall be immediately reported to the person in charge so that appropriate evaluation and/or repair can be made before further use

GENERAL CONSIDERATIONS

Pulse oximetry is used in conjunction with other assessment processes to determine the actual available oxygen in the blood for use by body tissues. Pulse oximetry measures the oxygen saturation of the red blood cells, (%SpO_2).

Studies have shown that EMS personnel are fairly accurate in the assessment and treatment of patients in profound hypoxia. However in mild to moderate hypoxic states, EMS personnel sometimes do not react until the patient has progressed to profound hypoxia. Signs of progressive hypoxia need to be identified rapidly and the condition treated before profound hypoxia occurs.

Use of pulse oximetry in conjunction with other assessment processes may sometimes identify those patients in mild to moderate hypoxia and, with proper intervention, profound hypoxia can be prevented.

If available, pulse oximetry should be used on all patients. Pulse oximetry should be maintained and evaluated until the patient is delivered to the emergency department.

INITIATE NORMAL AIRWAY AND OXYGENATION SUPPORT REGARDLESS OF THE AVAILABILITY OF PULSE OXIMETRY

NEVER BASE ANY TREATMENT OR OXYGEN THERAPY SOLELY ON THE READING FROM THE PULSE OXIMETER

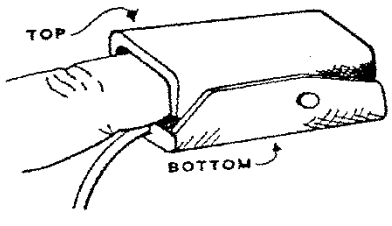
PROCEDURE

A. Select the sensor and apply according to manufacturer's recommendations. The following should be noted:

1. Finger clip sensors - These are designed for spot-check monitoring of older pediatric and adult patients and/or continuous monitoring for less than 30 minutes where patient movement is not expected.

   a. Insert finger (preferably left or right index finger) completely into sensor, keeping fingernail side facing the sensor top. It is specifically recommended that the thumb not be used in the finger clip sensor.

   b. For best results when using the finger clip in longer term monitoring or with active patients, secure the sensor cable independently from the sensor, preferably around the base of the finger. Make sure blood supply to the finger is not impaired by the application of the tape.



Finger Clip Sensor Positioning

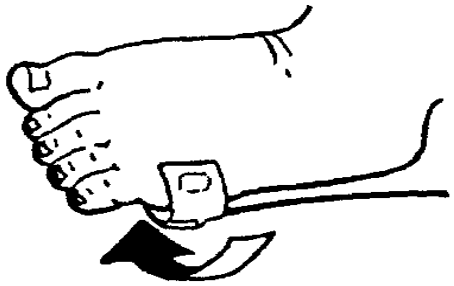
2. Flex sensor - This sensor is designed for monitoring pediatric and adult patients in which moderate patient movement is expected.

   a. Position the sensor on the top and bottom of the end of the finger or toe. Place the light emitter portion on the finger/toe-nail side and the detector of the side opposite of the nail, making sure to align the emitter and detector through the tissue.

   b. Secure the sensor with the type or brand of tape recommended by the manufacturer of the device making sure not to restrict blood flow. Attach the sensor cable independently at the base of the finger, again being careful not to restrict blood flow.

Infant Sensor Placement on Big Toe

3. Infant and neonatal sensors - These sensors are designed for continuous monitoring of infants and neonates since fingertip monitoring is impractical.
   a. The infant sensor is designed for application on the big toe of infants that weight greater than 2 kilograms (5 pounds).
   b. The neonatal sensor is designed for application on the foot of infants that are less than 2 kilograms in weight.
   c. Apply and secure these sensors as described for the flex sensor, being sure not to restrict blood supply to the monitored area.



Infant and Neonatal Sensor Placement on Foot

4. Ear clip sensor - This sensor is used when finger clip sensing is not possible. Be sure to clean the ear lobe with alcohol before applying the sensor. Be aware that pierced ears may allow some light to pass directly to the detector and result in an inaccurate reading.

5. Reflectance sensor - This sensor is used on well-vascularized skin surfaces in adult patients only. This method is not preferred in the prehospital setting.

B. Turn the oximeter on and verify operation according to manufacturer's operating procedure.

C. A relative operation check can be achieved by applying the sensor to your own finger.

D. Always cleanse the sensor site to remove blood and dirt to obtain a reliable reading. Some fingernail polishes may have to be removed to obtain a reading.

E. Apply sensor to patient and obtain reading.

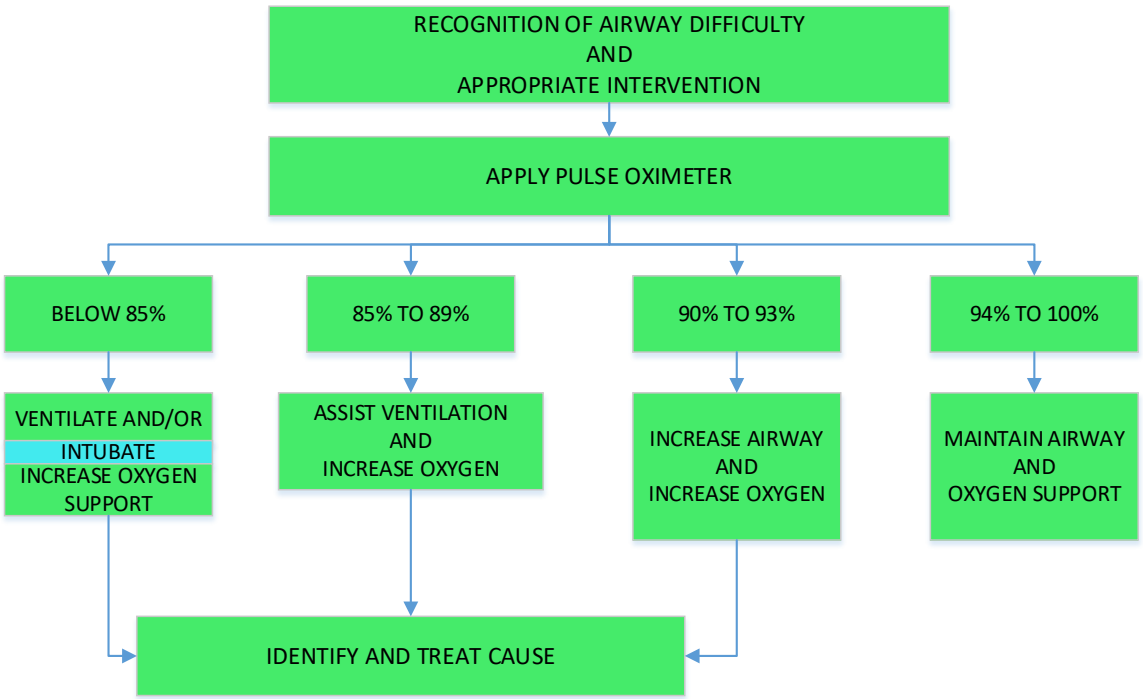
Interpretation of reading:

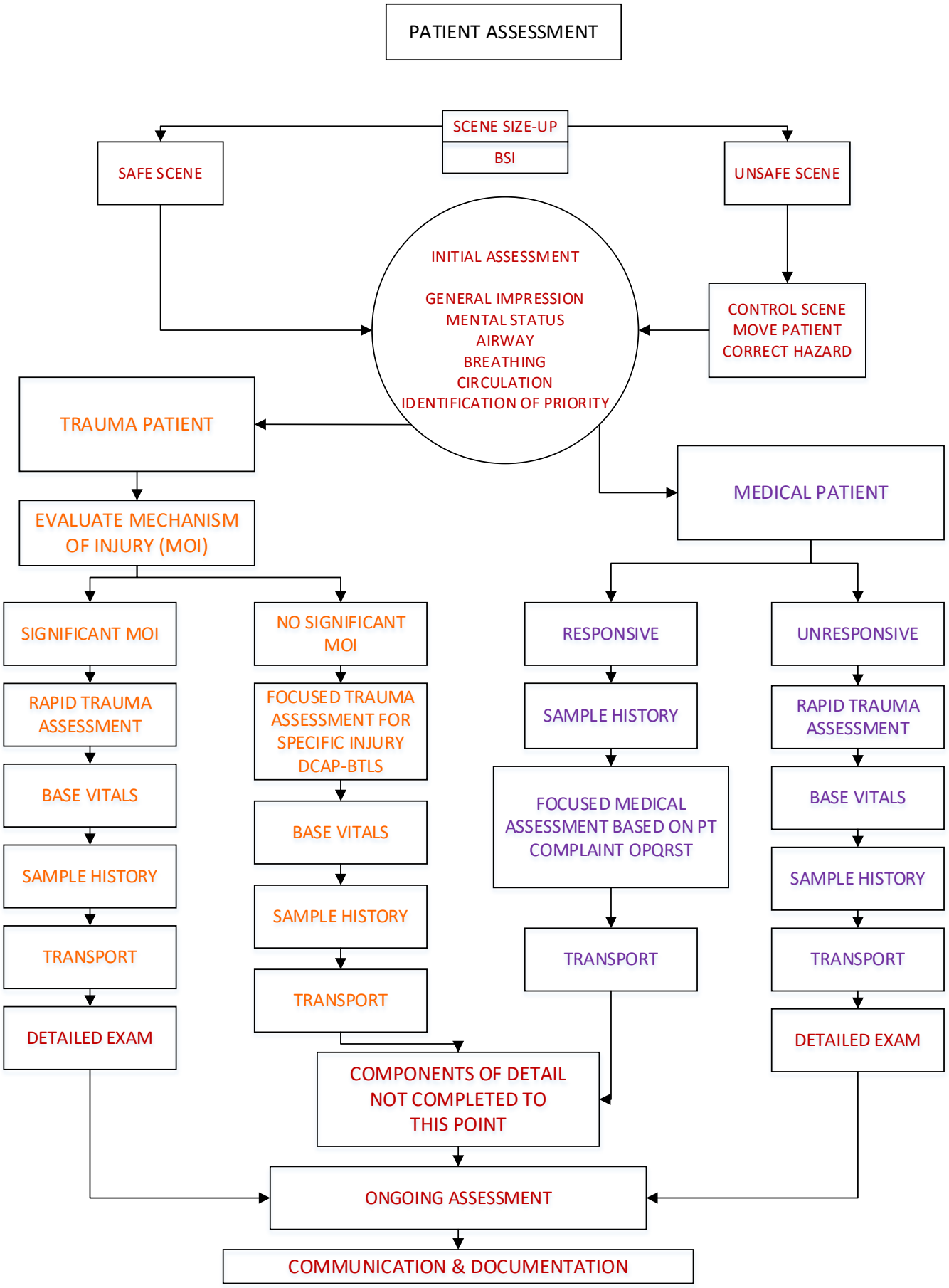
94% to 98% Ideal range - Maintain oxygen and airway support methods being used

90% to 93% Mild to moderate hypoxemia - Check airway and increase oxygen support until ideal range is achieved

85% to 89% Severe hypoxemia - Aggressive airway and oxygen support is essential
Look for and treat cause: i.e. COPD, metabolic imbalance, peripheral vascular shutdown

Below 85% **Be prepared to intubate and/or assist ventilation**




PATIENT ASSESSMENT
SCENE SIZE-UP
BSI
SAFE SCENE
UNSAFE SCENE
INITIAL ASSESSMENT
GENERAL IMPRESSION
MENTAL STATUS
AIRWAY
BREATHING
CIRCULATION
IDENTIFICATION OF PRIORITY
CONTROL SCENE
MOVE PATIENT
CORRECT HAZARD
TRAUMA PATIENT
MEDICAL PATIENT
EVALUATE MECHANISM OF INJURY (MOI)
SIGNIFICANT MOI
NO SIGNIFICANT MOI
RESPONSIVE
UNRESPONSIVE
RAPID TRAUMA ASSESSMENT
FOCUSED TRAUMA ASSESSMENT FOR SPECIFIC INJURY DCAP-BTLS
SAMPLE HISTORY
FOCUSED MEDICAL ASSESSMENT BASED ON PT COMPLAINT OPQRST
RAPID TRAUMA ASSESSMENT
BASE VITALS
BASE VITALS
BASE VITALS
SAMPLE HISTORY
SAMPLE HISTORY
SAMPLE HISTORY
TRANSPORT
TRANSPORT
TRANSPORT
TRANSPORT
DETAILED EXAM
DETAILED EXAM
COMPONENTS OF DETAIL NOT COMPLETED TO THIS POINT
ONGOING ASSESSMENT
COMMUNICATION & DOCUMENTATION

MEDICATION APPENDIX

MEDICATION LIST

Acetaminophen (Tylenol®, Ofirmev®)
Adenosine (Adenocard®)
Albuterol (Proventil®/Ventolin®)
Amiodarone
Aspirin
Atropine sulfate
Buprenorphine (Butrans®/Sublocade®)
Buprenorphine/naloxone (Suboxone®)
Calcium gluconate
10% Dextrose (D10)
25% Dextrose (D25)
50% Dextrose (D50)
Diazepam (Valium®)
Diphenhydramine (Benadryl®)
Dopamine (Inotropin®)
Epinephrine (Adrenalin®)
Fentanyl
Furosemide (Lasix®)
Glucagon
Hydromorphone (Dilaudid®)
Ibuprofen (Advil®, Motrin®)
Ketorolac (Toradol®)
Lidocaine (Xylocaine®) 2%
Methylprednisolone (Solumedrol®)
Midazolam (Versed®)
Morphine sulfate
Naloxone (Narcan®, EVZIO®)
Nitroglycerin
Nitrous oxide (N_2O)
Norepinephrine (Levophed®)
Oxygen (O_2)
Procainamide
Sodium bicarbonate
Tranexamic acid (TXA)
Vasopressin (Pitressin®)

PHARMACOLOGY REVIEW

I. ACTIONS OF DRUGS

A. Local effects

B. Systemic effects

II. EFFECTS DEPENDS UPON

A. Age of patient

B. Condition of patient

C. Dosage

D. Route of administration

III. ROUTE OF ADMINISTRATION

A. Intravenous (IV)

1. Most rapidly effective
2. Most dangerous
3. Should be given slowly through an established IV line

B. Intramuscular (IM)

1. Longer time to initial clinical effect
2. Longer duration of action
3. Deltoid or gluteus maximus Site
4. Absorption very dependent on blood flow

C. Subcutaneous (SQ)

1. Slower and more prolonged absorption
2. Best administered under the skin of the upper arms, thighs, or abdomen

D. Inhalation

1. Bronchodilators
2. Steroids

E. Endotracheal

1. Epinephrine, atropine, lidocaine, diazepam, or naloxone
2. Dilute usual IV dose with 10 ml of sterile water for the administration of these drugs

F. Sublingual (SL)

1. Rapid absorption

G. Oral

1. Ipecac
2. Charcoal

H. Rectal

1. Rapid but unpredictable absorption

I. Intranasal (IN)

1. Rapid and non-invasive administration
2. Viable route of administration for non-medical responders and laypersons

J. Intraosseous

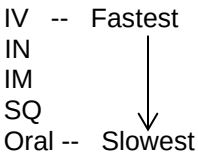
1. Rapidly established route when IV placement cannot be completed
2. Rapid absorption of medications into the blood stream nearly equivalent to IV route

K. Intracardiac

1. Dangerous
2. No advantage over IV or endotracheal routes
3. Dilute usual IV dose with 10ml of sterile water

IV. RATES OF ABSORPTION

A. Directly related to route of administration



V. ELIMINATION

A. Many methods

B. Usually metabolized by the liver

C. Eliminated by the kidneys, lungs, skin

VI. TERMS

A. Indications - Conditions for which the drug is used

B. Contraindications - Conditions for which the drug should not be used

C. Depressants - Lessens / decreases activity

D. Stimulant - Increases activity

E. Physiologic Action - Action from the body from a normal dose of the drug

F. Therapeutic Action - Beneficial action expected

G. Untoward Reaction - Harmful side effect

H. Irritation - Damage to tissue

PHARMACOLOGY REVIEW (continued)

I. Antagonism - Opposition between effects of drugs

J. Cumulative Action - Increased action after several doses

K. Tolerance - Decreased effects after repeated doses

L. Synergism - Combined effects greater than the sum of parts

M. Potentiation - Enhancement of one drug by another

N. Habituation - Drug necessary for feeling of "well-being"

O. Idiosyncrasy - Unexpected abnormal response to a drug

P. Hypersensitivity - Exaggerated response and/or allergy

VII. AUTONOMIC NERVOUS SYSTEM

Controls automatic or involuntary actions

A. Parasympathetic - Controls vegetative functions

B. Sympathetic - "Flight or fight"

VIII. PARASYMPATHETIC NERVOUS SYSTEM

A. Mediated by vagus nerve

B. Acetylcholine is transmitter (cholinergic)

C. Atropine is acetylcholine blocker

IX. SYMPATHETIC NERVOUS SYSTEM

A. Mediated by nerves from sympathetic chain

B. Norepinephrine is an adrenergic transmitter

C. Epinephrine is released from adrenals

X. SYMPATHETIC RECEPTORS

A. Alpha (α)

B. Beta (β)

XI. COMMON SYMPATHETIC AGENTS

A. Isoproterenol (Isuprel®) - pure β agonist

B. Epinephrine (Adrenalin®) - predominately β agonist

C. Dobutamine (Dobutrex®) – predominately β, slight α agonist

D. Norepinephrine (Levophed®) - predominately α agonist

PHARMACOLOGY REVIEW (continued)

E. Dopamine (Intropin®) - β agonist at low doses; α agonist at high doses

F. Metaraminol (Aramine®) - predominately α agonist

G. Phenylephrine (Neo-Synephrine®) - pure α agonist

XII. SYMPATHETIC BLOCKERS

A. Propranolol (Inderal®) - β blocker

XIII.DRUG ADMINISTRATION

Important documentation data elements regarding drug administration for the patient care report:

A. Indication

B. Order

C. Dose

D. Observation

E. Dilution

F. Route

G. Rate

H. Patient's clinical response

I. Adverse reactions or symptoms

ACETAMINOPHEN (TYLENOL®, OFIRMEV®)

THERAPEUTIC EFFECTS: May work peripherally to block pain impulse generation; may also inhibit prostaglandin synthesis in the central nervous system

INDICATIONS: Pain control, fever control

CONTRAINDICATIONS: Hypersensitivity, severe acute liver disease

SIDE EFFECTS: Tylenol®: Nausea, vomiting, loss of appetite, abdominal pain
Ofirmev®: Nausea, vomiting, headache, insomnia

HOW SUPPLIED: Tylenol®: 325 mg, 500 mg, 650 mg tablets
80 mg, 160 mg chewable tablets
160 mg/5 ml, 500 mg/15 ml solution
100 mg/ml, 120 mg/5 ml, 160 mg/5ml suspension
Ofirmev®: 1000 mg/100 ml vial (10 mg/ml)

ADMINISTRATION: Tylenol® is administered orally
Ofirmev® is administered intravenously

ADULT DOSE: Tylenol®: 15 mg/kg PO (maximum dose of 1000 mg)
Ofirmev®: Patient weight < 50 kg: 15 mg/kg IV (maximum dose of 750 mg)
Patient weight ≥ 50 kg: 15 mg/kg IV (maximum dose of 1000 mg)

PEDIATRIC DOSE: Tylenol®: 15 mg/kg PO (maximum dose of 1000 mg)
Ofirmev®: Neonates up to age 28 days: 12.5 mg/kg IV
Patient weight < 50 kg: 15 mg/kg IV (maximum dose of 750 mg)
Patient weight ≥ 50 kg: 15 mg/kg IV (maximum dose of 1000 mg)

ADENOSINE (ADENOCARD®)

THERAPEUTIC EFFECTS:	Adenosine slows tachycardias associated with the AV node via modulation of the autonomic nervous system without causing negative inotropic effects. It acts directly on sinus pacemaker cells and vagal nerve terminals to decrease chronotropic and dromotropic activity. Adenosine is the drug of choice for paroxysmal supraventricular tachycardia (PSVT) and can be used diagnostically for stable, wide-complex tachycardias of unknown type after two doses of lidocaine.	
INDICATIONS:	Conversion of PSVT to sinus rhythm	
CONTRAINDICATIONS:	Second or third degree AV block, or sick-sinus syndrome	
	Hypersensitivity to adenosine	
SIDE EFFECTS:	Facial flushing	Chest pain
	Lightheadedness	Hypotension
	Paresthesia	Shortness of breath
	Headache	Nausea
	Diaphoresis	Metallic taste
	Palpitations	
HOW SUPPLIED:	6 mg/2 ml and 12 mg/4 ml vials or prefilled syringes	
ADULT DOSAGE:	Initial Dose:	6 mg rapid IVP (over 1-3 sec.) immediately followed with a 20 ml saline flush
	Repeat Dose:	If no response is observed after 1-2 min., administer 12 mg rapid IVP (over 1-3 sec.) immediately followed with a 20 ml saline flush
PEDIATRIC DOSAGE:	Initial Dose:	0.1 mg/kg rapid IVP followed with a 10 ml saline flush
	Repeat Dose:	If no response is observed after 1-2 min., administer 0.2 mg/kg rapid IVP followed with a 10 ml saline flush

ALBUTEROL
(PROVENTIL® / VENTOLIN®)

THERAPEUTIC EFFECTS:	β-2 agonist (stimulator), dilates smooth muscle, bronchodilator
INDICATIONS:	Shortness of breath caused by bronchoconstriction May help transiently decrease potassium levels in patients with hyperkalemia
CONTRAINDICATIONS:	Allergy to drug Excessive prior use of β agonist Shortness of breath not from bronchoconstriction
SIDE EFFECTS:	Nervousness Weakness Tremor Increased heart rate
HOW SUPPLIED:	Unit-dose vials (2.5 mg/3 ml normal saline)
ADMINISTRATION:	By inhalation through a breathing aerosol device.
ADULT DOSAGE:	2.5 mg/3 ml unit-dose vial via nebulizing device with oxygen at 8 l/min
PEDIATRIC DOSAGE:	Weight ≥ 10 kg: 2.5 mg/3 ml unit-dose vial via nebulizing device with oxygen at 8 l/min Weight <10 kg: 1.25 mg/3ml unit-dose vial via nebulizing device with oxygen at 8 l/min

AMIODARONE (CORDORONE®, NEXTERONE®, PACERONE®)

THERAPEUTIC ACTIONS:	Amiodarone prevents or suppresses cardiac arrhythmias by prolongation of the myocardial action potential duration and refractory period and via non-competitive alpha- and beta-adrenergic inhibition.
INDICATIONS:	Recurrent ventricular fibrillation
	Recurrent hemodynamically unstable ventricular tachycardia
CONTRAINDICATIONS:	Severe sinus node dysfunction
	Marked sinus bradycardia
	Second-degree or third-degree atrio-ventricular heart block
	Bradycardia resulting in syncope (except for patients with pacemakers)
	Known allergy or hypersensitivity to amiodarone
SIDE EFFECTS:	Hypotension, particularly with repeated doses
	Hypotension, heart block and/or severe bradycardia if administered with other drugs that prolong the QT interval (i.e. procainamide)
HOW SUPPLIED:	150 mg and 300 mg vials
ADMINISTRATION:	Can be administered via IV or IO routes
DOSAGE:	ADULT: 300 mg IV or IO (150 mg IV or IO for second dose)
	PEDIATRIC: 5 mg/kg IV or IO

ASPIRIN

THERAPEUTIC EFFECTS:	Aspirin exhibits analgesic, anti-inflammatory, and antipyretic activity. Due to aspirin's ability to inhibit platelet aggregation and cause vasodilation, there is a decreased likelihood of thrombosis.
INDICATIONS:	Cardiac related chest pain
CONTRAINDICATIONS:	Aspirin hypersensitivity
	Active or history of GI lesions
	Impaired renal function
	Pregnancy
	Trauma
SIDE EFFECTS:	GI bleeds
	Mucosal lesions
	Bronchial spasm in some asthma patients
HOW SUPPLIED:	325 mg coated tablets
ADMINISTRATION:	Orally
ADULT DOSAGE:	160-325 mg upon onset of cardiac signs and symptoms

ATROPINE SULFATE

THERAPEUTIC EFFECTS: By blocking parasympathetic (vagal) action on the heart, atropine increases the rate of discharge by the sinus node, enhances conduction through the AV junction, and accelerates the heart rate, thereby improving cardiac output. In addition, by speeding up a slow heart to a normal rate, atropine reduces the chances of ectopic activity in the ventricles and thus of ventricular fibrillation.

Atropine is most effective in reversing bradycardia due to increased parasympathetic tone or to morphine; it is less effective in treating bradycardias due to actual damage to the AV or SA node.

INDICATIONS: Sinus bradycardia when accompanied by hypotension

Second- and third-degree heart block when accompanied by bradycardia

In some cases of asystole to remove any type of heart block

As an antidote in nerve agent or organophosphate poisoning (mega doses)

CONTRAINDICATIONS: Atrial flutter or atrial fibrillation where there is a rapid ventricular response

Glaucoma - narrow angle

Use with caution in myocardial infarction

SIDE EFFECTS: The patient should be warned that they may experience some of the following side effects and that these side effects are part of the drug's usual and expected actions:

Blurred vision, headache, pupillary dilatation
Dry mouth, thirst
Flushing of the skin

HOW SUPPLIED: Prefilled syringes containing 1 mg in 10 ml

ADMINISTRATION: In the field, atropine is usually given intravenously for bradycardia

For organophosphate poisoning, a combination of intravenous and intramuscular administration is commonly used

In resuscitation from cardiac arrest, if an intravenous route cannot be established, atropine may be given through the endotracheal tube

ATROPINE SULFATE (continued)

ADULT DOSAGE:

In bradycardia: 0.5 mg IV, repeated at 5-minute intervals until the desired heart rate is achieved

The total dose should not exceed 3 mg except during the treatment of organophosphate poisoning

Doses smaller than 0.5 mg, or a dose given too slowly, may slow rather than speed up the heart rate

Excessive doses may precipitate ventricular tachycardia or fibrillation

For asystole: 1 mg IV, repeated in 5 minutes if asystole persists

For organophosphates: 2 mg IM and 1 mg IV.

The IV dose may be repeated every 5 to 10 minutes as needed until a decrease in secretions is observed

Endotracheal dosage: 1.0-2.0 mg diluted in 10ml NS

PEDIATRIC DOSAGE:

In bradycardia: 0.02 mg/kg; may be repeated one time

Minimum dose - 0.1 mg

Maximum dose - 0.5 mg in child/1.0mg in adolescent

Endotracheal dosage: 0.02 mg/kg diluted in 10ml NS

BUPRENORPHINE (BUTRANS®/SUBLOCADE®)

THERAPEUTIC EFFECTS:	Partial opioid agonist
INDICATIONS:	Opioid dependence
	Severe chronic pain requiring long-term opioid treatment
	Severe chronic pain with opioid tolerance
CONTRAINDICATIONS:	Respiratory depression
	Opioid use within the previous 12 to 24 hours
	History of hypersensitivity to buprenorphine
	Concomitant use of benzodiazepines
HOW SUPPLIED:	2 mg and 8 mg tablets
	5 mcg/hour, 10 mcg/hour, 15 mcg/hour, and 20 mcg/hour transdermal patches
DOSAGE	Based upon the patient's age, weight, co-morbidities, and potency of the opioid of use or abuse, begin a 2-day induction period with buprenorphine 8 mg orally for the average adult adjusting the dose in 2 mg to 4 mg increments or decrements to a level to achieve suppression of signs and symptoms of opioid withdrawal
	Although the target daily dose is buprenorphine 16 mg per day, patients can be treated effectively with 4 mg to 24 mg per day.

BUPRENORPHINE/NALOXONE (SUBOXONE®)

THERAPEUTIC EFFECTS: Partial opioid agonist

INDICATIONS: Opioid dependence

Severe chronic pain requiring long-term opioid treatment

Severe chronic pain with opioid tolerance

CONTRAINDICATIONS: Respiratory depression

History of hypersensitivity to buprenorphine or naloxone

Concomitant use of benzodiazepines

HOW SUPPLIED: Sublingual or buccal films containing:
buprenorphine/naloxone 2 mg/0.5 mg
buprenorphine/naloxone 4 mg/1 mg
buprenorphine/naloxone 8 mg/2 mg
buprenorphine/naloxone 12 mg/3 mg

DOSAGE Based upon the patient's age, weight, co-morbidities, and potency of the opioid of use or abuse, the first induction dose is buprenorphine/ naloxone 8 mg/2 mg for the average adult or begin with an initial dose of buprenorphine/naloxone 2 mg/0.5 mg or buprenorphine/naloxone 4 mg/1 mg titrating upwards with 2 mg to 4 mg increments of buprenorphine at approximately 2-hour intervals, under supervision, to buprenorphine/naloxone 8 mg/ 2 mg based upon on the control of acute withdrawal symptoms.

On the second day of therapy, a single daily dose of up to buprenorphine/naloxone 16 mg/4 mg is recommended.

CALCIUM GLUCONATE

THERAPEUTIC EFFECTS:	Bone mineral component
	Cofactor in enzymatic reactions
	Essential for neurotransmission, muscle contraction, and many signal transduction pathways.
INDICATIONS:	Inhalation injuries and topical burns due to hydrofluoric acid
	Antidote for calcium channel blocker overdose
CONTRAINDICATIONS:	Hypercalcemia
	Documented hypersensitivity
	Sarcoidosis
	Life-threatening cardiac arrhythmias may occur in known or suspected severe hypokalemia
	WARNING: There is a risk for digitalis toxicity
HOW SUPPLIED:	Prefilled vials of calcium gluconate 10% (100 mg/mL)
DOSAGE:	For nebulization during the treatment of an inhalation injury, calcium gluconate 2.5 g in 100 mL of water (can be made by diluting 25 mL of calcium gluconate 10% in 100 mL of water).

10% DEXTROSE (D10)

THERAPEUTIC EFFECTS:	Restores circulating blood sugar level to normal in states of hypoglycemia Acts transiently as an osmotic diuretic
INDICATIONS:	When blood sugar reading is below 60 mg/dl with glucometer in symptomatic patients: Treatment of coma caused by hypoglycemia Treatment of coma of unknown cause Treatment of status epilepticus or uncertain cause Treatment of some cases of refractory cardiac arrest
CONTRAINDICATIONS:	Avoid in cases of presumed intracranial hemorrhage
SIDE EFFECTS:	May precipitate severe neurologic symptoms in alcoholics For this reason, when dextrose is given to a known alcoholic, it should ideally be accompanied by thiamine 100 mg IV or IM which will prevent these neurologic symptoms (Wernicke's encephalopathy or Korsakoff syndrome) Will cause tissue necrosis if it infiltrates; should therefore be given only through a good, rapidly flowing IV line
HOW SUPPLIED:	Vials containing 250 ml of 10% dextrose (25 gm of dextrose)
ADMINISTRATION:	Given intravenously, through a free-flowing intravenous line, preferably in a large vein. If possible, draw blood for serum glucose determinations before administering the dextrose.
ADULT DOSAGE:	250 ml of 10% dextrose (25 gm) as an IV bolus
PEDIATRIC DOSAGE:	5 ml/kg in children under 50 pounds Newborn dose: 2.5 ml/kg

25% DEXTROSE (D25)

THERAPEUTIC EFFECTS:	Restores circulating blood sugar level to normal in states of hypoglycemia Acts transiently as an osmotic diuretic
INDICATIONS:	When blood sugar reading is below 60 mg/dl with glucometer in symptomatic patients: Treatment of coma caused by hypoglycemia Treatment of coma of unknown cause Treatment of status epilepticus of uncertain cause Treatment of some cases of refractory cardiac arrest
CONTRAINDICATIONS:	Avoid in cases of presumed intracranial hemorrhage
SIDE EFFECTS:	May precipitate severe neurologic symptoms in alcoholics For this reason, when dextrose is given to a known alcoholic, it should ideally be accompanied by thiamine 100 mg IV or IM which will prevent these neurologic symptoms (Wernicke's encephalopathy or Korsakoff syndrome) Will cause tissue necrosis if it infiltrates; should therefore be given only through a good, rapidly flowing IV line
HOW SUPPLIED:	Prefilled syringes and vials containing 10 ml of 25% dextrose (2.5 gm of dextrose)
ADMINISTRATION:	Given intravenously, through a free-flowing intravenous line, preferably in a large vein. If possible, draw blood for serum glucose determinations before administering the dextrose.
ADULT DOSAGE:	100 ml of 25% dextrose (25 gm) as an IV bolus
PEDIATRIC DOSAGE:	2 ml/kg in children under 50 pounds Newborn dose: 1 ml/kg

50% DEXTROSE (D50)

THERAPEUTIC EFFECTS:	Restores circulating blood sugar level to normal in states of hypoglycemia
	Acts transiently as an osmotic diuretic
INDICATIONS:	When blood sugar reading is below 60 mg/dl with glucometer in symptomatic patients:
	Treatment of coma caused by hypoglycemia
	Treatment of coma of unknown cause
	Treatment of status epilepticus of uncertain cause
	Treatment of some cases of refractory cardiac arrest
CONTRAINDICATIONS:	Avoid in cases of presumed intracranial hemorrhage
SIDE EFFECTS:	May precipitate severe neurologic symptoms in alcoholics
	For this reason, when dextrose is given to a known alcoholic, it should ideally be accompanied by thiamine 100 mg IV or IM which will prevent these neurologic symptoms (Wernicke's encephalopathy or Korsakoff syndrome)
	Will cause tissue necrosis if it infiltrates; should therefore be given only through a good, rapidly flowing IV line
HOW SUPPLIED:	Prefilled syringes and vials containing 50 ml of 50% dextrose (25 gm of dextrose)
ADMINISTRATION:	Given intravenously, through a free-flowing intravenous line, preferably in a large vein
	If possible, draw blood for serum glucose determinations before administering the dextrose
ADULT DOSAGE:	50 ml of 50% dextrose (25 gm) as a bolus IV
PEDIATRIC DOSAGE:	1 ml/kg in children over 50 pounds

DIAZEPAM (VALIUM®)

THERAPEUTIC EFFECTS:	Through its depressant action on the central nervous system, it can terminate some seizures.
	Has a calming effect in anxiety or violent behavior.
INDICATIONS:	Status epilepticus
	Sedation (e.g. prior to cardioversion in conscious patients)
	Pharmacologic management of agitated/violent patients and behavioral emergencies
CONTRAINDICATIONS:	Allergy to benzodiazepines
	Dangerous with prior ingestion of alcohol or other sedative drug
	Respiratory depression from any source
	Hypotension
SIDE EFFECTS:	Hypotension
	Confusion, unconsciousness
	In some patients, especially the elderly, the critically ill, and those with pulmonary disease, may cause respiratory arrest and/or cardiac arrest
HOW SUPPLIED:	In prefilled syringes and ampules of 2 ml and in vials of 10 ml, frequently in a concentration of 5 mg/ml
ADMINISTRATION:	Intravenously in slow titrated doses or rectally. Although it can be given IM, the absorption is poor and unpredictable.
ADULT DOSAGE:	2-5 mg IV or per rectum, titrate additional doses up to a total of 10 mg
PEDIATRIC DOSAGE:	0.2-0.3 mg/kg IV to a maximum dose of 10 mg
	0.5 mg/kg per rectum to a maximum dose of 10 mg

DIPHENYDRAMINE (BENADRYL®)

THERAPEUTIC EFFECTS:	Blocks histamine effects in allergic reactions
	Sedative
	Reverses the side effects of some phenothiazines.
INDICATIONS:	Allergic reactions
	As an adjunct to epinephrine in the treatment of anaphylactic shock
	Extrapyramidal reactions (Parkinson-like movements) secondary to phenothiazines
CONTRAINDICATIONS:	Narrow angle (acute) glaucoma
	Prostate enlargement
	Ulcer disease with symptoms of obstruction
SIDE EFFECTS:	Drowsiness, confusion
	Blurring of vision
	Dry mouth
	Thickening of bronchial secretions
HOW SUPPLIED:	In vials of 10 or 30 ml, containing 10 mg/ml
	In vials of 10 ml containing 50 mg/ml
	In ampules of 1 ml containing 50 mg/ml
	In prefilled syringes containing 50 mg in 1 ml
ADULT DOSAGE:	25-50 mg IVP or IM
PEDIATRIC DOSAGE:	1 mg/kg IV or IM to a maximum dose of 50 mg

DOPAMINE (INTROPIN®)

THERAPEUTIC EFFECTS:	β-sympathetic drug causes an increase in the force and rate of cardiac contractions as well as dilation of renal and mesenteric arteries. This latter effect promotes urine flow, and for this reason, dopamine is sometimes preferred over norepinephrine (which constricts renal arteries) in shock. Dopamine causes less increase in oxygen consumption by the myocardium than does isoproterenol. At low doses, the β agonist effects of dopamine predominate. At high doses, dopamine has α agonist effects as well and thus will cause vasoconstriction.
INDICATIONS:	To increase cardiac output in cardiogenic shock while maintaining good renal perfusion
CONTRAINDICATIONS:	Should not be used as first-line therapy in hypotension caused by hypovolemia (e.g., hemorrhagic shock), where volume replacement should precede the use of vasopressors Pheochromocytoma (a tumor that produces epinephrine and/or related substances) Should not be given in the presence of uncorrected tachyarrhythmia or ventricular fibrillation Do not mix with bicarbonate since dopamine may be inactivated by alkaline solutions
SIDE EFFECTS:	Ectopic beats, palpitations, tachycardia Nausea, vomiting Dyspnea, angina Headache
HOW SUPPLIED:	400 mg in 250 ml D5W
ADMINISTRATION:	Given by titrated intravenous infusion (microdrip infusion set)
ADULT DOSAGE:	Start the infusion at a rate of 5 mcg/kg/min and titrate the infusion until adequate heart rate, blood pressure, and level of consciousness are achieved.

EPINEPHRINE (ADRENALIN®)

THERAPEUTIC EFFECTS: In cardiac arrest, may restore electric activity in asystole; increases myocardial contractility; and decreases the threshold for defibrillation--all through its actions as a beta sympathetic agent.

In addition, the alpha effects of epinephrine, causing vasoconstriction, elevate the perfusion pressure and may thus improve coronary blood flow during external cardiac compressions.

In anaphylaxis, acts as a bronchodilator (beta effect) and helps maintain blood pressure (alpha effect).

INDICATIONS: In cardiac arrest, to restore electric activity in asystole or to enhance defibrillation potential in ventricular fibrillation; also to elevate systemic vascular resistance and thereby improve perfusion pressure during resuscitation.

To treat the life-threatening symptoms of anaphylaxis

To treat acute attacks of asthma

CONTRAINDICATIONS: Must be used with caution in patients with angina, hypertension**,** or hyperthyroidism

THERE ARE NO CONTRAINDICATIONS TO THE USE OF EPINEPHRINE IN THE SITUATION OF CARDIAC ARREST OR ANAPHYLACTIC SHOCK

SIDE EFFECTS: In a conscious patient, may cause palpitations, from tachycardia or ectopic beats, and elevations of blood pressure (which may not be desirable if the patient is already hypertensive)

The asthmatic with preexisting heart disease may experience dysrhythmias if treated with epinephrine

HOW SUPPLIED: Prefilled syringes containing 1 mg in 10 ml (0.1 mg/ml)

Ampules containing 1 mg in 1 ml (1 mg/ml)

Multi-dose vial: 30 mg in 30 ml (0.1 mg/ml)

NOTE: Due to safety concerns and drug dosing errors, a national patient safety initiative has amended the accepted citations for the concentrations of epinephrine to **0.1 mg/ml** (formerly 1:10,000 solution) and **1 mg/ml** (formerly 1:1,000 solution).

ADMINISTRATION: In cardiac arrest, epinephrine is given intravenously every 3 minutes (consider escalating dose in beta blocker or calcium channel blocker overdose)

If an IV route cannot be established quickly, the drug may be instilled in the tracheo-bronchial tree via catheter through an endotracheal tube

EPINEPHRINE (ADRENALIN®) (continued)

For anaphylactic reactions, epinephrine is given via the intramuscular route

ADULT DOSAGE:

Cardiac arrest:

Initial Dose: 1.0 mg (10 ml of 0.1 mg/ml solution) IVP

Additional Doses: 1.0 mg (10 ml of 0.1 mg/ml solution). Consider up to 0.2 mg/kg for beta blocker or calcium channel blocker overdose.

Endotracheal dose: 2 mg (1mg/ml solution) diluted with 10 ml normal saline given via catheter during ventilation

Anaphylactic Reactions:

Mild reactions: 0.3 mg intramuscular, (0.3 ml of a 1 mg/ml solution) (Do not, however, inject fingers or toes)

Another 0.3 mg is given SQ can be administered on another extremity

Severe reactions, with shock: 0.5 mg slow IV. (5 ml of a 0.1 mg/ml solution)

For mild to moderate asthmatic attacks: 0.3 mg to 0.5 mg SQ (0.3 to 0.5 ml of a 1 mg/ml solution)

PEDIATRIC DOSAGE:

Bradycardia: 0.01 mg/kg of a 0.1 mg/ml solution every 3 minutes

Cardiac Arrest:

Initial Dose: 0.01 mg/kg IVP or IO push (0.1 mg/ml solution)

Additional Doses: 0.1 mg/kg IVP or IO push (1 mg/ml solution)

Endotracheal dose: 0.1 mg/kg (1mg/ml solution) diluted with 2 ml of NS

Newborn Cardiac Arrest: 0.02 mg/kg IV or IO (0.1 mg/ml solution) every 5 min.

Allergic Reaction/Asthma: 0.01 mg/kg SQ (0.1mg/ml solution) Max 0.3 mg
If no response and IV in place, 0.1 mg/kg IVP (0.1 mg.ml solution)

FENTANYL

THERAPEUTIC EFFECTS: Primary use is an analgesic

INDICATIONS: Management of acute pain including, but not limited to, cardiac pain

CONTRAINDICATIONS: Hypersensitivity

Should be used with caution in the elderly and in patients with hypotension, suspected gastrointestinal obstruction, head injury, and concomitant CNS depressants

SIDE EFFECTS: Respiratory depression (reversible with naloxone)

Nausea and vomiting

HOW SUPPLIED: 50 mcg/ml in 2 ml, 5 ml, or 10 ml ampules

50 mcg.ml in 2 ml, 5 ml, or 10 ml vials

ADMINISTRATION: Given intravenously in the prehospital setting

NOTE: Be aware that this medication is also prescribed to patient in the form of a transdermal patch or an oral lollipop, solution or tablet. As such, it may be the cause of altered mental status or an opioid overdose

ADULT DOSAGE: 1 mcg/kg IV, IO, or IM (maximum initial dose 100 mcg)

PEDIATRIC DOSAGE: 1 mcg/kg IV, IO, or IM (maximum initial dose of 100 mcg)

FUROSEMIDE (LASIX®)

THERAPEUTIC EFFECTS:	Potent diuretic, causing the excretion of large volumes of urine within 5 to 30 minutes of administration, thus useful in ridding the body of excess fluid in conditions such as congestive heart failure (CHF). However, furosemide may be useful in long range transports of patients in marked heart failure (especially catheterized patients) where there is a need to begin definitive therapy before the patient arrives at the hospital.
INDICATIONS:	To reverse fluid overload associated with congestive heart failure and pulmonary edema
CONTRAINDICATIONS:	Should not be given to pregnant women Hypokalemia may be suspected in a patient who has been on chronic diuretic therapy or whose EKG shows prominent P waves, diminished T waves, and the presence of U waves
SIDE EFFECTS:	Immediate side effects may include nausea and vomiting, potassium depletion (with attendant cardiac dysrhythmias), and dehydration
HOW SUPPLIED:	Pre-filled syringes of 10 ml in a concentration of 10 mg/ml
ADMINISTRATION:	In the prehospital setting, furosemide is given intravenously
ADULT DOSAGE:	1 mg/kg slowly IV push. If a response is not obtained, a second dose may be given in 30 minutes.

GLUCAGON

THERAPEUTIC EFFECTS:	Accelerates the breakdown of glycogen to glucose in the liver, causing an increase in blood glucose level. Glucagon also relaxes the smooth muscle of the GI tract Glucagon is helpful, in hypoglycemia only if the liver glycogen is available. Because glucagon is of little or no help in states of starvation, adrenal insufficiency, or chronic hypoglycemia, glucose should be considered for the treatment of hypoglycemia.
INDICATIONS:	For the treatment of hypoglycemia when IV Dextrose is not available Anaphylaxis
CONTRAINDICATIONS:	Glucagon is contraindicated in patients with known hypersensitivity to it or in patients with pheochromocytoma
SIDE EFFECTS:	Glucagon is relatively free of adverse reactions except for occasional nausea and vomiting which may also occur with hypoglycemia Generalized allergic reactions including urticaria, respiratory distress and hypotension, have been reported in patients who receive glucagon by injection
HOW SUPPLIED:	Vials of 1 mg glucagon with 1 ml of diluting solution
ADMINISTRATION:	For adults and for children weighing more than 20 kg, administration may be by subcutaneous intramuscular or intravenous injection Glucagon must be reconstituted with dilution solution provided and used immediately. If dose is higher than 2 mg, reconstitute with sterile water for injection and use immediately Glucagon is compatible with dextrose solutions, but precipitates may form in solutions of sodium chloride, potassium chloride or calcium chloride
ADULT DOSAGE:	In hypoglycemia, 0.5 to 1.0 mg IV, SQ or IM injection. Response is usually seen in 5 to 20 minutes. If response is delayed, dose may be repeated 1 to 2 times
PEDIATRIC DOSAGE:	In hypoglycemia for children weighing more than 20 kg, 0.5 to 1.0 mg IV, SC or IM injection. Response is usually seen in 5 to 20 minutes. If response is delayed, dose may be repeated 1 to 2 times

HYDROMORPHONE (DILAUDID®)

THERAPEUTIC EFFECTS: Narcotic agonist-analgesic of opiate receptors; inhibits ascending pain pathways, thus altering response to pain; increases pain threshold; produces analgesia, respiratory depression, and sedation

INDICATIONS: Management of acute pain

CONTRAINDICATIONS: Hypersensitivity

SIDE EFFECTS: Respiratory depression, apnea, lightheadedness, dysphoria, euphoria, dry mouth, pruritis, circulatory depression

HOW SUPPLIED: 2 mg, 4 mg, 8 mg tablets
1mg/ml oral solution
0.5 mg/0.5ml, 1 mg/ml, 2 mg/ml, 4 mg/ml injectable solution

ADMINISTRATION: Oral, IV, IO, IM

ADULT DOSE: 0.015mg/kg IM, IV, or IO (maximum initial dose 2 mg; maximum cumulative dose of 4 mg)
Oral solution: 2.5-10 mg PO
Tablets: 2-4 mg PO

PEDIATRIC DOSE: 0.015mg/kg IM, IV, or IO (maximum initial dose 2 mg; maximum cumulative dose of 4 mg)
Patient weight ≥ 50 kg: 2-4 mg PO
Infants > 6 months of age and patient weight < 50 kg: 0.04-0.08 mg/kg PO

WARNING: Should be used with caution in the elderly and in patients with hypotension, suspected gastrointestinal obstruction, head injury, and concomitant CNS depressants

IBUPROFEN (ADVIL®, MOTRIN®)

THERAPEUTIC EFFECTS: Inhibits synthesis of prostaglandins in body tissues by inhibiting at least 2 cyclo-oxygenase (COX) isoenzymes, COX-1 and COX-2. May inhibit chemotaxis, alter lymphocyte activity, decrease proinflammatory cytokine activity, and inhibit neutrophil aggregation; these effects may contribute to anti-inflammatory activity

INDICATIONS: For the acute management of pain or as an antipyretic

CONTRAINDICATIONS: Aspirin allergy; perioperative pain in setting of coronary artery bypass graft (CABG) surgery; preterm infants with untreated proven or suspected infection; bleeding with active intracranial hemorrhage or GI bleed; thrombocytopenia, coagulation defects, proven or necrotizing enterocolitis, significant renal impairment, congenital heart disease where patency or the patent ductus arteriosis (PDA) is necessary for pulmonary or systemic blood flow

SIDE EFFECTS: Gastric irritation or bleeding

HOW SUPPLIED: 200 mg, 400 mg, 600 mg, 800 mg tablets
100 mg/5 ml oral suspension

ADMINISTRATION: Oral

ADULT DOSE: 10 mg/kg PO (maximum dose of 800 mg)

PEDIATRIC DOSE: Patients of age > 6 months of age: 10 mg/kg PO (maximum dose of 800 mg)

KETAMINE HYDROCHLORIDE (KETALAR®)

THERAPEUTIC EFFECTS:	Blocks N-methyl D-aspartate (NMDA) receptors producing a dissociative sedative/ hypnotic state
INDICATIONS:	Management of pain and agitated or violent behavior
CONTRAINDICATIONS:	Hypersensitivity Relative/controversial contraindications include head trauma, intracranial mass/ hemorrhage, hypertension, angina, stroke, and underlying psychiatric disorder
SIDE EFFECTS:	Overdose may lead to panic attacks and aggressive behavior; rarely seizures, increased intracranial pressure, and cardiac arrest. Ketamine has a very similar chemical makeup to phencyclidine (PCP), but it is shorter acting and less toxic
HOW SUPPLIED:	Vials containing solutions of 1 mg, 10 mg, 50 mg, and 100 mg
ADMINISTRATION:	Can be administered via the intranasal, intramuscular, intravenous, or intraosseous routes
ADULT DOSAGE:	Moderate pain: 0.5 mg/kg IN (maximum initial dose 25 mg; maximum cumulative dose of 100 mg) Severe pain: 0.25 mg/kg IM, IV, IO (maximum initial dose 25 mg; maximum cumulative dose of 100 mg) High violence risk: 2 mg/kg IV or 4 mg/kg IM
PEDIATRIC DOSAGE:	Moderate pain: 0.5 mg/kg IN (maximum initial dose 25 mg; maximum cumulative dose of 100 mg) Severe pain: 0.25 mg/kg IM, IV, IO (maximum initial dose 25 mg; maximum cumulative dose of 100 mg) High violence risk: 1 mg/kg IV or 3 mg/kg IM

KETOROLAC (TORADOL®)

THERAPEUTIC EFFECTS: Inhibits synthesis of prostaglandins in body tissues by inhibiting at least 2 cyclo-oxygenase (COX) isoenzymes, COX-1 and COX-2. May inhibit chemotaxis, alter lymphocyte activity, decrease proinflammatory cytokine activity, and inhibit neutrophil aggregation; these effects may contribute to anti-inflammatory activity

INDICATIONS: For the acute management of moderately severe pain

CONTRAINDICATIONS: Allergy to aspirin, ketorolac, or other NSAIDS; women who are in active labor or are breastfeeding, significant renal impairment particularly when associated with volume depletion, previous or current GI bleeding, intracranial bleeding, coagulation defects, patients with a high risk of bleeding

SIDE EFFECTS: Nausea, vomiting, diarrhea, heartburn, headache, dizziness, constipation

HOW SUPPLIED: 15 mg/ml, 30 mg/ml injectable solution
10 mg tablets

ADMINISTRATION: IV or IM (the oral form is only approved for administration status post the administration of an initial dose IV or IM)

ADULT DOSE: 30 mg IM in adults who are not pregnant; for geriatric patients, 1mg/kg IM (maximum dose of 30 mg)
15 mg IV in adults who are not pregnant

PEDIATRIC DOSE: For age of 2 years or greater: 1mg/kg IM (maximum dose 30 mg)
0.5mg/kg IV (maximum dose 15 mg)

LIDOCAINE (XYLOCAINE®) 2%

THERAPEUTIC EFFECTS:	Suppresses ventricular ectopic activity by decreasing the excitability of heart muscle and the cardiac conduction system.
INDICATIONS:	Lidocaine is the drug of first choice:
	To suppress premature ventricular contractions (PVCs) in the appropriate setting
	To prevent recurrence of ventricular fibrillation after electric conversion
	To treat ventricular tachycardia
	To suppress reflex rise in intracranial pressure during intubation
CONTRAINDICATIONS:	Known history of allergy to lidocaine or local anesthetics (e.g., Novocaine®)
	Second- or third-degree heart block
	Sinus bradycardia or sinus arrest
	Idioventricular rhythm
SIDE EFFECTS:	By decreasing the force of cardiac contractions as well as decreasing peripheral resistance, may cause a fall in cardiac output and blood pressure
	May cause numbness, drowsiness, or confusion when given in high doses, especially to the elderly or to patients in heart failure, may cause seizures
HOW SUPPLIED:	Ampules and prefilled syringes containing 100 mg in 5 ml (20 mg/ml) for bolus injection
ADMINISTRATION:	Given by intravenous bolus
	Reduce the dosage (both bolus and infusion) by half for patients in congestive heart failure or shock and for patients over 70 years old
	If an intravenous route cannot be established, lidocaine may be given via catheter through an endotracheal tube
ADULT DOSAGE:	1.5 mg/kg IV push, followed by 50 mg bolus every 20 minutes
	1 mg/kg IV push prior to intubation of head injured patient
PEDIATRIC DOSAGE:	Ventricular fibrillation: 1 mg/kg IVP, IO push or ET

METHYLPREDNISOLONE (SOLUMEDROL®)

THERAPEUTIC EFFECT:	Methylprednisolone is a synthetic glucocorticoid that is used as an anti-inflammatory or immunosuppressive agent. Glucocorticoids are naturally occurring hormones that prevent or suppress inflammation and immune responses when administered at pharmacological doses. These drugs have very little mineralocorticoid activity and are therefore not used to manage adrenal insufficiency.
INDICATIONS:	Wheezing
CONTRAINDICATIONS:	Corticosteroid hypersensitivity
	Fungal infection
SIDE EFFECTS:	Hypertension
	Impaired wound healing
	Fluid retention
	Increased risk of infection
	Muscle weakness
	Osteoporosis
HOW SUPPLIED:	Injectable solution: 40 mg, 80 mg, 125 mg, 500 mg, 1g, 2g, 20 mg/ml, 40 mg/ml, 80 mg/ml
ADMINISTRATION:	IV or IM
ADULT DOSE:	125 mg IV or IM
.	
PEDIATRIC DOSE:	0.5-1 mg/kg IV or IM

MIDAZOLAM (VERSED®)

THERAPEUTIC EFFECTS:	May potentiate the effects of GABA, depress the CNS, and suppress the spread of seizure activity.
INDICATIONS:	Seizures
	Sedation
	Pharmacologic management of agitated/violent patients and behavioral emergencies
CONTRAINDICATIONS:	Hypersensitivity to the medication
	Narrow angle glaucoma
SIDE EFFECTS:	Hypotension
	Respiratory depression
	Amnesia
HOW SUPPLIED:	5 mg/2 ml
ADMINISTRATION:	Intravenous
	Intramuscular
	Intranasal
ADULT DOSAGE:	2-5 mg IVP every 5 minutes as needed
	10 mg IN
PEDIATRIC DOSAGE:	0.1m mg/kg IV, IO, or IM

MORPHINE SULFATE

THERAPEUTIC EFFECTS:	Primary use is as an analgesic
	Helps to allay the anxiety associated with pulmonary edema.
INDICATIONS:	To treat the anxiety associated with pulmonary edema in congestive heart failure
	To relieve pain in myocardial infarction and other, selected conditions
CONTRAINDICATIONS:	Marked hypotension**.**
	Respiratory depression, except when caused by pulmonary edema, where the drug may be used if ventilatory support is provided.
SIDE EFFECTS:	Hypotension (most likely in volume depleted patients).
	Increased vagal tone leading to bradycardia (This effect can be reversed with atropine)
	Respiratory depression (This effect can be reversed with naloxone)
	Nausea and vomiting
HOW SUPPLIED:	Prefilled (Tubex®) syringes containing 10mg.
ADMINISTRATION:	Given by titrated intravenous injection.
	If hypotension occurs, keep the patient flat, and do not give more of the drug.
	Watch for respiratory depression.
ADULT DOSAGE:	2 to 5 mg by IV push every 5 to 30 minutes until the desired therapeutic effect is achieved. Do not exceed 15 mg in the field.

NALOXONE
(NARCAN®, EVZIO®)

THERAPEUTIC EFFECTS: Specific antidote for opioids (narcotic agents)

Reverses the actions of all opioids including heroin, morphine, methadone, codeine, Demerol®, Dilaudid®, Darvon®, paregoric, and Percodan®.

Naloxone is thus effective in counteracting the effects of overdose from any of these agents, although large doses are required to reverse the effects of Darvon overdose.

Naloxone will reverse stupor, coma, respiratory depression, etc. when these are due to narcotic overdose.

INDICATIONS: To treat known opioid overdose or altered mental status suspected to be due to an opioid overdose.

CONTRAINDICATIONS: None

SIDE EFFECTS: Overly rapid administration may precipitate projectile vomiting and ventricular dysrhythmias

Administration to people who are physically dependent on narcotics may cause an acute withdrawal syndrome

For this reason, naloxone should be given very slowly, using improvement of respiratory status as an end point

In general, the duration of action of naloxone is shorter than that of the opioids it is used to counteract

Thus, the patient who has been successfully roused with naloxone may fall back into stupor or coma as the naloxone wears off

These patients must therefore be watched closely, and the dose of naloxone should be repeated as necessary

Pulmonary edema and sudden death have been report in rare cases

HOW SUPPLIED: 2 mg in 2 ml prefilled syringe

0.4 mg in an auto-injector

2 mg nasal spray

4 mg nasal spray

NALOXONE (NARCAN®, EVZIO®) (continued)

ADMINISTRATION: In the field, given slowly by slow intravenous injection, intramuscular, intranasal, or via auto-injector.

As soon as there is improvement in the respirations, stop giving the drug.

It may be preferable that the patient not wake up fully in the field, as these patients may become agitated or violent when they abruptly regain consciousness. The goal of treatment is reversal of respiratory depression which should be used as a guide and should also be addressed with airway management and ventilator support.

If there is no response to two doses, suspect overdose with a high-potency opioid and/or another etiology of altered mental status or respiratory depression

ADULT DOSAGE: Initial dose: 2 mg slow IVP. Administer this solution slowly IV while monitoring the rate and depth of the patient's respirations. This dose can also be administered ETT, IM, IN, via nebulizer, or SQ.

Initial dose via auto-injector: 0.4 mg

Initial dose of Narcan® nasal spray: 4 mg IN

If there is no response to the full dose of naloxone, naloxone administration may be repeated in 2 to 5 minutes via the same or alternate route of administration

PEDIATRIC DOSAGE: 0.1 mg/kg IV

Newborn dose (narcotic dependent with decreased respiration):
0.1 mg/kg every 3 minutes until respiration is improved.

Narcan® nasal spray has been approved by the FDA for pediatric patients and can be administered to them in the 4 mg dose. If available, the 2 mg dose should be given to neonates and infants.

NOTE: The manufacturer of EVZIO® recommends pinching the thigh prior to administration of naloxone via auto-injector at this injection site.

NITROGLYCERIN

THERAPEUTIC EFFECTS:	The primary pharmacologic effect of nitroglycerin and related drugs is to relax smooth muscle, and the effects of nitroglycerin on the cardiovascular system are chiefly due to relaxation of vascular smooth muscle (hence vasodilatation) Nitroglycerin provides relief of pain in angina probably by dilating coronary arteries and thereby increasing blood flow through them as well as by decreasing myocardial oxygen demand Through its vasodilatation action on peripheral vessels, nitroglycerin promotes pooling of the blood in the systemic circulation and decreases the resistance against which the heart has to pump (the afterload). These effects may be useful in treating congestive heart failure
INDICATIONS:	To relieve the pain of angina To treat selected cases of pulmonary edema due to left heart failure
CONTRAINDICATIONS:	Use with caution in presumed right ventricular myocardial infarction
SIDE EFFECTS:	Transient, throbbing headache Hypotension Dizziness, weakness
HOW SUPPLIED:	Many forms, including ointment, spray, tablets, sustained release capsules For use in the field, tablets or spray of 0.4 mg strength are preferred
ADMINISTRATION:	Given sublingually. The patient should be semi-sitting or recumbent. Monitor blood pressure and be prepared for hypotension.
ADULT DOSAGE:	One 0.4 mg tablet or spray under the tongue. May repeat once every 5 minutes as long as blood pressure remains normal

NITROUS OXIDE (N_20) (ENTONOX®, NITRONOX®)

THERAPEUTIC EFFECTS: The analgesic mechanism of action is described as opioid in nature and may involve a number of spinal neuromodulators. The anxiolytic effect is similar to that of benzodiazepine and may involve gamma aminobutyric (GABA) receptors. The anesthesia mechanism may involve GABA and possibly N-methyl-D-aspartate receptors as well. In general, the effect of nitrous oxide ceases as soon as the inhalation stops, with no residual effect

RELATIVE CONTRAINDICATIONS: History of stroke, hypotension, pregnancy, known cardiac conditions

INDICATIONS: Analgesia in the patient who is capable of self-administration of this medication

CONTRAINDICATIONS: Significant respiratory compromise, suspected abnormal air-filled cavities (e.g. pneumothorax, bowel obstruction, air embolism), patients who have engaged in scuba diving within the preceding 24 hours, middle ear infection, recent vitreous or retinal eye surgery

SIDE EFFECTS: Hypoxia in sedated or unresponsive patients, potential sedation of bystanders when exposed to the medication or when administered to a patient in a poorly ventilated environment, dizziness, nausea, vomiting, confusion, loss of consciousness

HOW SUPPLIED: While nitrous oxide for general anesthesia is available in a 70% nitrous oxide/30% oxygen mixture, a 50% nitrous oxide/50% oxygen mixture is sufficient for adequate analgesia for pain control in patients under the care of EMS providers

ADMINISTRATION: Self-administration by the patient via a simple face mask or mouthpiece in a 4 ventilated environment to minimize inhalation of the medication by EMS providers or other bystanders. **Never secure the medication delivery device to the patient. Always position the device in a position where it will independently fall away from the patient's face and airway without the external supportive maneuvers.**

ADULT DOSAGE: Self-administration of 50% nitrous oxide and 50% oxygen

PEDIATRIC DOSAGE: The patient must be an age capable of self-administration of 50% nitrous oxide and 50% oxygen. The assistance of administration by a parent, care provider, or other party should not be necessary or permitted

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NOREPINEPHRINE (LEVOPHED®, LEVARTERENOL®)

THERAPEUTIC EFFECTS:	As an alpha and beta adrenergic agonist, norepinephrine increases cardiac output and heart rate, decreases renal perfusion and peripheral vascular resistance, and causes variable blood pressure effects.
INDICATIONS:	As a vasopressor agent in the management of shock
CONTRAINDICATIONS:	Hypersensitivity, hypotension due to blood volume deficit, peripheral vascular thrombosis (except for lifesaving procedures) Concomitant use with some general anesthetics: chloroform, trichloroethylene, cyclopropane, halothane
SIDE EFFECTS:	Norepinephrine is a vesicant and can cause severe tissue damage if extravasation occurs. Should not be administered in the same IV line as alkaline solutions as these may deactivate its therapeutic effect.
HOW SUPPLIED:	Single-dose ampules containing 4 mg in 4 mL (1mg/mL) Single-dose vials containing 4 mg in 4 mL (1 mg/mL) (*Add one ampule or via to a liter of 5% dextrose in water or normal saline with 5% dextrose to produce a solution of 4 mcg/mL of norepinephrine*)
ADMINISTRATION:	Intravenously as an infusion
ADULT DOSAGE:	0.02 to 0.04 mcg/kg/minute IV for bradycardia 0.05 to 0.5 mcg/kg/minute IV for hypotension or shock

OXYGEN (O_2)

THERAPEUTIC EFFECTS:	Reverses the deleterious effects of hypoxemia on the brain, heart, and other vital organs.
INDICATIONS:	Any condition in which global or local hypoxemia may be present. As examples: Cardiac or respiratory arrest (given with artificial ventilation) Dyspnea or respiratory distress from any cause Chest pain Shock Coma from any cause Chest trauma Near drowning Pulmonary edema Toxic inhalations (smoke, chemicals, carbon monoxide) Acute exacerbation of asthma Acute exacerbation of COPD Acute stroke Head injury Altered mental status Intractable seizures Any patient in critical condition
CONTRAINDICATIONS:	None. May depress respirations in rare patients with chronic obstructive pulmonary disease. This is <u>not</u> a contraindication to its use, but simply means that such patients must be watched closely and assisted to breathe if the respiratory rate declines.
SIDE EFFECTS:	None when given for short periods to adults (less than 24 hours)
HOW SUPPLIED:	As a compressed gas in cylinders of varying sizes.
ADMINISTRATION:	Administered by inhalation from a dosage mask, nasal cannula, endotracheal tube, etc. A patent airway and adequate ventilation must be ensured.
ADULT DOSAGE:	Dependent upon on the condition being treated with the goal of achieving at least a pulse oximetry reading of 94%. For cardiac arrest and other critical conditions, 100% oxygen should be administered as soon as possible.

PROCAINAMIDE

THERAPEUTIC EFFECTS: Suppresses diastolic repolarization by reducing the automaticity of all myocardial pacemakers and slowing intraventricular conduction.

INDICATIONS: Ventricular fibrillation or pulseless ventricular tachycardia that reoccurs after periods of non-ventricular fibrillation rhythms.

CONTRAINDICATIONS: Complete or first degree heart block

Presence of congestive heart failure

Torsades de pointes

Patients with lupus or myasthenia gravis

Patients taking quinidine or disopyramide (Norpace®, Rhymodan®)

SIDE EFFECTS: Hypotension

Widening of the QRS complex

Heart block

HOW SUPPLIED: 1000 mg/10 ml

ADMINISTRATION: Intravenously as an infusion.

ADULT DOSAGE: Infuse at 20 mg/min up to a total dose of 17 mg/kg to load the patient with procainamide, then infuse at 1 to 4 mg/min for patients with normal renal function

For patients with renal failure, the total loading dose is 12 mg/kg followed by an infusion of 1 mg/min.

SODIUM BICARBONATE

THERAPEUTIC EFFECTS:	By neutralizing excess acid, helps return the blood towards a physiologic pH in which normal metabolic processes and sympathomimetic agents (such as epinephrine) are pharmacologically more effective
INDICATIONS:	To treat severe metabolic acidosis To treat hyperkalemia (high serum potassium) To promote the excretion of some types of drugs taken in overdose
CONTRAINDICATIONS:	None
PRECAUTIONS:	Because each meq of bicarbonate comes along with a meq of sodium, sodium bicarbonate has the same effect as any other salt-containing infusion, i.e., it increases the vascular volume Three 50 ml syringes of sodium bicarbonate (1 meq/ml) contain approximately the same amount of salt as 1 liter of normal saline. Patients in borderline heart failure or chronic renal failure cannot tolerate salt loads of this magnitude
SIDE EFFECTS:	Administration of sodium bicarbonate lowers serum potassium In some cases, this is the desired effect, as when bicarbonate is used to treat hyperkalemia However, if the potassium falls too low (particularly in cardiac patients or in patients taking diuretics), the cardiac muscle can become irritable and dysrhythmias may occur Sodium bicarbonate administration transiently raises the arterial carbon dioxide level, and thus, its administration must be accompanied by adequate ventilation
HOW SUPPLIED:	Vials and prefilled syringes of 50 ml containing 1 meq/ml.
ADMINISTRATION:	Intravenously, usually as a bolus in the prehospital setting, but can be administered as an infusion

SODIUM BICARBONATE (continued)

ADULT DOSAGE:

Cardiac arrest:

If used at all, 1 meq/kg after the first 10 minutes of CPR

Acidosis should primarily be prevented with adequate ventilation

Do not give bicarbonate in the same syringe with epinephrine or calcium .

For other conditions: As ordered by the EMS medical director and/or transferring physician.

PEDIATRIC DOSAGE:

Cardiac Arrest:

Acidosis should primarily be prevented with adequate ventilation

1 meq/kg diluted with 1 ml/kg normal saline

Newborn: 0.5 meq/kg diluted with .5 ml/kg normal saline

TRANEXAMIC ACID (TXA)

THERAPEUTIC ACTIONS: Anti-fibrinolytic that reversibly binds lysine receptors on plasminogen and/or plasmin

INDICATIONS: Treat or prevent excessive blood loss secondary to major trauma, particularly from bleeding sites that are not accessible or amenable to application of direct pressure and/or a tourniquet, e.g. intraabdominal hemorrhage

CONTRAINDICATIONS: Hypersensitivity

Subarachnoid hemorrhage

Increased risk for thromboembolism

SIDE EFFECTS:

Headaches	Anaphylaxis
Back aches	Pulmonary emboli
Deep vein thrombosis	Visual disturbances
Cerebral edema	Hypotension

HOW SUPPLIED: 100 mg/ml injectable solution in ampules containing 500 mg of TXA (5 ml) and 1 gm of TXA (10 ml)

ADMINISTRATION: Intravenous

ADULT DOSAGE: 1 gm IV over 10 minutes within 3 hours of injury followed by 1 gm infused over 8 hours status post trauma

PEDIATRIC DOSAGE: Children 12 years of age or older: 1 gm IV over 10 minutes within 3 hours of injury followed by 1 gm infused over 8 hours status post trauma

Children under the age of 12 years: A definitive dosing regimen has not yet been determined although in 2012, The Royal College of Paediatrics and Child Health of the United Kingdom recommended a 15 mg/kg (maximum 1 gm) IV loading dose over 10 minutes within 3 hours of injury followed by an infusion of 2 mg/kg/hour IV infused over 8 hours status post trauma or until the bleeding stops

NOTE: EMS medical directors who elect to include the administration of tranexamic acid within an EMS protocol should do so with engagement of and collaboration with their respective local or regional trauma system network and colleagues. To achieve the maximal efficacy of this medication, patients who receive tranexamic acid in the prehospital setting should be transported to a trauma center that also includes this medication as an option within the facility's hemorrhage control protocols and have the capability and resources to administer a tranexamic acid infusion.

VASOPRESSIN (PITRESSIN®)

THERAPEUTIC EFFECTS: Vasoconstriction, as an α agonist, with shunting of the blood to the brain and the heart

INDICATIONS: Ventricular fibrillation

Pulseless ventricular tachycardia

CONTRAINDICATIONS: Known hypersensitivity (vasopressin is a naturally occurring substance in the body; hence, adverse or allergic reactions are extremely rare)

SIDE EFFECTS: Mesenteric or limb ischemia secondary to arterial vasospasm

Nausea

Vomiting

Diarrhea

HOW SUPPLIED: 20 units/1 ml

ADMINISTRATION: Intravenous

ADULT DOSAGE: 40 units IV push