ACUTE STROKE

GENERAL CONSIDERATIONS

1) 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.

2) Some patients who have had a stroke may be unable to communicate but can understand what is being said to and around them. This can be seen in a component of expressive aphasia. Some stroke patients may have difficulty understanding directions and questions which is known as receptive aphasia.

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

4) 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. Please be aware that stroke patient can often times demonstrate nonspecific ST changes on 12 lead ECGs.

5) 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. It is for this reason that it is essential to know the local hospital capabilities, understanding your locale and Hospitals designated Comprehensive Stroke Centers. In instances where you may be outside of main locale, please refer to the included table of Ohio stroke centers and map showing Comprehensive Stroke Centers as of December 23, 2021(p. 93-95).

6) 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").

7) 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.

8) 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:

    a) Facial droop/smile/grimace
    b) Arm drift
    c) Speech

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

   a) Vision disturbance
   b) Aphasia
   c) Sensory neglect

10) South Western Ambulance utilizes the Los Angeles Motor Scale (LAMS) Score for acute CVAs to distinguish deficits and dictate potential primary transfer point for patient of suspected CVA. This score is detailed on p. 92. Patients within 24 hours of symptoms onset and scores of:
    a) 1-3 should be transported to the closest Primary Stroke Center hospital
       i) South Western Ambulance Transport, Franklin County Primary Stroke Centers include: Ohio State University East Hospital, OhioHealth Doctor's Hospital, OhioHealth Grant Medical Center, Mt. Carmel St. Anne's
    b) 4-5 should be transported to the closest Comprehensive Stroke Center unless doing so will bypass a Primary Stroke Center AND add significant time in excess of 15 minutes of incremental transports.
       i) Central Ohio Transport, Franklin County Comprehensive Stroke Centers include: Mt. Carmel East, The Ohio State University Hospital, OhioHealth Riverside Methodist Hospital
11) 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.

12) 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).

13) 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

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

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

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

2) Evaluate patient's general appearance, relevant history of condition and determine:
   - **O**nset of the event
   - **P**rovocation or palliation
   - **Q**uality of the pain
   - **R**egion and radiation
   - **S**everity
   - **T**ime

   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

3) Conduct Los Angeles Motor Scale (LAMS) Score.
4) Determine blood glucose level.

    a) 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)**
        1. Blood glucose ≥ 60 mg/dL, begin immediate transport.

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

6) 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

1) Assist EMS professionals, obtain patient condition and circumstance.
2) Apply monitor and check rhythm.
3) Start heplock/saline lock or IV normal saline TKO while enroute to hospital.
4) Determine blood glucose level.
    a) 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

1) Assume charge of situation and confer with EMS professionals about condition of patient and situation.
2) If patient does not have a secure protected airway, intubate per the endotracheal intubation guideline.
3) Apply monitor and check rhythm.
4) Establish heplock/saline lock or IV normal saline TKO.
5) Determine blood glucose level.
    a) If blood glucose < 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.
6) Re-evaluate patient condition, contact medical direction, and transport immediately to hospital.

Los Angeles Motor Scale			Value	Score of	
Face	Moves Normally	0		0	Closest Appropriate ED
	One Side of Face if Weak o	1			
Arm	Both Sides Move Normally	0			
	One Side is Weak	1		1 to 3	Closest Primary Stroke Center
	One Side if Flaccid	2			
Grip	Both Sides Move Normally	0			
	One Side if Weak	1		4 to 5	Closest Comprehensive Stroke Center
	One Side is Flaccid	2			
		Total			

Ohio Department of Health Hospital Stroke Level Recognition - Revised 12/23/2021

AHR	Hospital Name	Hospital Address	City	County	Zip Code	Stroke Level
1001	UHHS-Geauga Regional Hospital	13207 Ravenna Road	Chardon	Geauga	44024	Primary Stroke Center
1003	Jewish Hospital	4777 E. Galbraith Road	Cincinnati	Hamilton	45236	Thrombectomy Capable Stroke Center
1005	Riverside Methodist Hospital	3535 Olentangy River Road	Columbus	Franklin	43214	Comprehensive Stroke Center
1006	Lake West Hospital	36000 Euclid Ave.	Willoughby	Lake	44094	Primary Stroke Center
1007	Parma Community General Hosp	7007 Powers Blvd	Parma	Cuyahoga	44129	Primary Stroke Center
1008	UHHS-Richmond Hts. Hospital	27100 Chardon Road	Richmond Hts	Cuyahoga	44143	Primary Stroke Center
1011	Madison County Hospital	210 N. Main Street	London	Madison	43140	Acute Stroke Ready Hospital
1015	Doctor's Hospital	5100 West Broad St.	Columbus	Franklin	43228	Primary Stroke Center
1017	Kettering Medical Center	3535 Southern Blvd	Kettering	Montgomery	45429	Comprehensive Stroke Center
1018	Mercy Health Lorain Hospital	3700 Kolbe Road	Lorain	Lorain	44304	Primary Stroke Center
1019	Hillcrest Hospital	6780 Mayfield Road	Mayfield Hts	Cuyahoga	44124	Thrombectomy Capable Stroke Center
1024	Bethesda North Hospital	10500 Montgomery Road	Cincinnati	Hamilton	45242	Thrombectomy Capable Stroke Center
1026	Mercy Health - West Hospital	3300 Mercy Health Boulevard	Cincinnati	Hamilton	45211	Primary Stroke Center
1027	Mount Carmel East	6001 East Broad Street	Columbus	Franklin	43213	Comprehensive Stroke Center
1028	Mercy Hospital Clermont	3000 Hospital Drive	Batavia	Clermont	45103	Acute Stroke Ready Hospital
1031	Sycamore Medical Center	4000 Miamisburg-Centerville Road	Miamisburg	Montgomery	45342	Primary Stroke Center
1033	Mercy Hospital Fairfield	3000 Mack Road	Fairfield	Butler	45014	Primary Stroke Center
1034	University Hospitals St. John Medical Center	29000 Center Ridge Rd.	Westlake	Cuyahoga	44146	Primary Stroke Center
1035	Southview Hospital	1997 Miamisburg-Centerville Rd	Dayton	Montgomery	45459	Primary Stroke Center
1036	Upper Valley Medical Center	3130 N. Dixie Highway	Troy	Miami	45373	Acute Stroke Ready Hospital
1101	Blanchard Valley Reg. Hlth Ctr-Bluf	139 Garau Street	Bluffton	Allen	45817	Acute Stroke Ready Hospital
1102	Lima Memorial Hospital	1001 Bellefontaine Avenue	Lima	Allen	45804	Primary Stroke Center
1111	Jt. Twnshp Dist. Mem. Hospital	200 St. Clair Street	St. Marys	Auglaize	45885	Acute Stroke Ready Hospital
1116	Atrium Medical Center	One Medical Center Drive	Franklin	Warren	43560	Primary Stroke Center
1117	Fort Hamilton Hospital	630 Eaton Avenue	Hamilton	Butler	45013	Primary Stroke Center
1122	Springfield Regional Medical Center	100 Medical Center Drive	Springfield	Clark	45504	Primary Stroke Center
1133	Euclid Hospital	18901 Lakeshore Blvd	Euclid	Cuyahoga	44119	Primary Stroke Center
1136	Marymount Hospital	12300 McCracken Road	Garfield Heights	Cuyahoga	44125	Primary Stroke Center
1142	University Hospitals Cleveland Medical Center	11100 Euclid Avenue	Cleveland	Cuyahoga	44106	Comprehensive Stroke Center
1145	Fairview Hospital	18101 Lorain Avenue	Cleveland	Cuyahoga	44111	Thrombectomy Capable Stroke Center
1150	MetroHealth Medical Center	2500 MetroHealth Drive	Cleveland	Cuyahoga	44109	Comprehensive Stroke Center
1151	Cleveland Clinic Foundation	9500 Euclid Avenue	Cleveland	Cuyahoga	44195	Comprehensive Stroke Center
1164	Firelands Reg. Med Ctr-Main Campus	1111 Hayes Ave	Sandusky	Erie	44870	Primary Stroke Center
1167	Fairfield Medical Center	401 North Ewing Street	Lancaster	Fairfield	43130	Primary Stroke Center
1170	The Ohio State University Hosp-East	181 Taylor Avenue	Columbus	Franklin	43203	Primary Stroke Center
1171	The Ohio State University Hospitals	410 West 10th Avenue	Columbus	Franklin	43210	Comprehensive Stroke Center
1175	Mount Carmel Grove City	5300 North Meadows Dr.	Grove City	Wayne	43123	Primary Stroke Center
1178	Bay Park Community Hospital	2801 Bay Park Drive	Oregon	Lucas	43616	Primary Stroke Center
1180	Greene Memorial Hospital, Inc	1141 North Monroe Drive	Xenia	Greene	45385	Acute Stroke Ready Hospital
1187	Christ Hospital	2139 Auburn Avenue	Cincinnati	Hamilton	45219	Primary Stroke Center
1189	University of Cincinnati Medical Center, LLC	234 Goodman Street	Cincinnati	Hamilton	45219	Comprehensive Stroke Center
1191	Good Samaritan Hospital	375 Dixmyth Avenue	Cincinnati	Hamilton	45220	Comprehensive Stroke Center
1193	Mercy Hospital Anderson	7500 State Road	Cincinnati	Hamilton	45255	Primary Stroke Center
1194	Blanchard Valley Regional Hlth Ctr	1900 S. Main St.	Findlay	Hancock	45840	Primary Stroke Center
1202	Pomerene Hospital	981 Wooster Road	Millersburg	Holmes	44654	Acute Stroke Ready Hospital
1204	Fisher-Titus Medical Center	272 Benedict Avenue	Norwalk	Huron	43302	Primary Stroke Center
1223	Mercy St. Charles Hospital	2600 Navarre Avenue	Oregon	Lucas	43081	Primary Stroke Center
1224	St. Luke's Hospital	5901 Monclova Road	Maumee	Lucas	43537	Thrombectomy Capable Stroke Center
1225	Mercy St. Vincent Medical Center	2213 Cherry Street	Toledo	Lucas	43110	Comprehensive Stroke Center
1228	University of Toledo Medical Center	3000 Arlington Avenue	Toledo	Lucas	44708	Primary Stroke Center
1230	Mercy Health St. Elizabeth Health Center	1044 Belmont Avenue	Youngstown	Mahoning	44501	Primary Stroke Center
1236	Medina General Hospital	1000 E. Washington Street	Medina	Medina	44256	Primary Stroke Center
1246	Grandview Hospital	405 Grand Avenue	Dayton	Montgomery	45405	Primary Stroke Center
1247	Miami Valley Hospital	One Wyoming Street	Dayton	Montgomery	43614	Comprehensive Stroke Center
1255	University Hospitals Portage Medical Center	6847 N. Chestnut Street	Ravenna	Portage	44266	Primary Stroke Center
1257	MedCentral Hlth Sys-Mansfield	335 Glessner Avenue	Mansfield	Richland	44903	Primary Stroke Center
1263	Memorial Hospital	715 S. Taft Avenue	Fremont	Sandusky	43420	Primary Stroke Center

Ohio Department of Health Hospital Stroke Level Recognition - Revised 12/23/2021

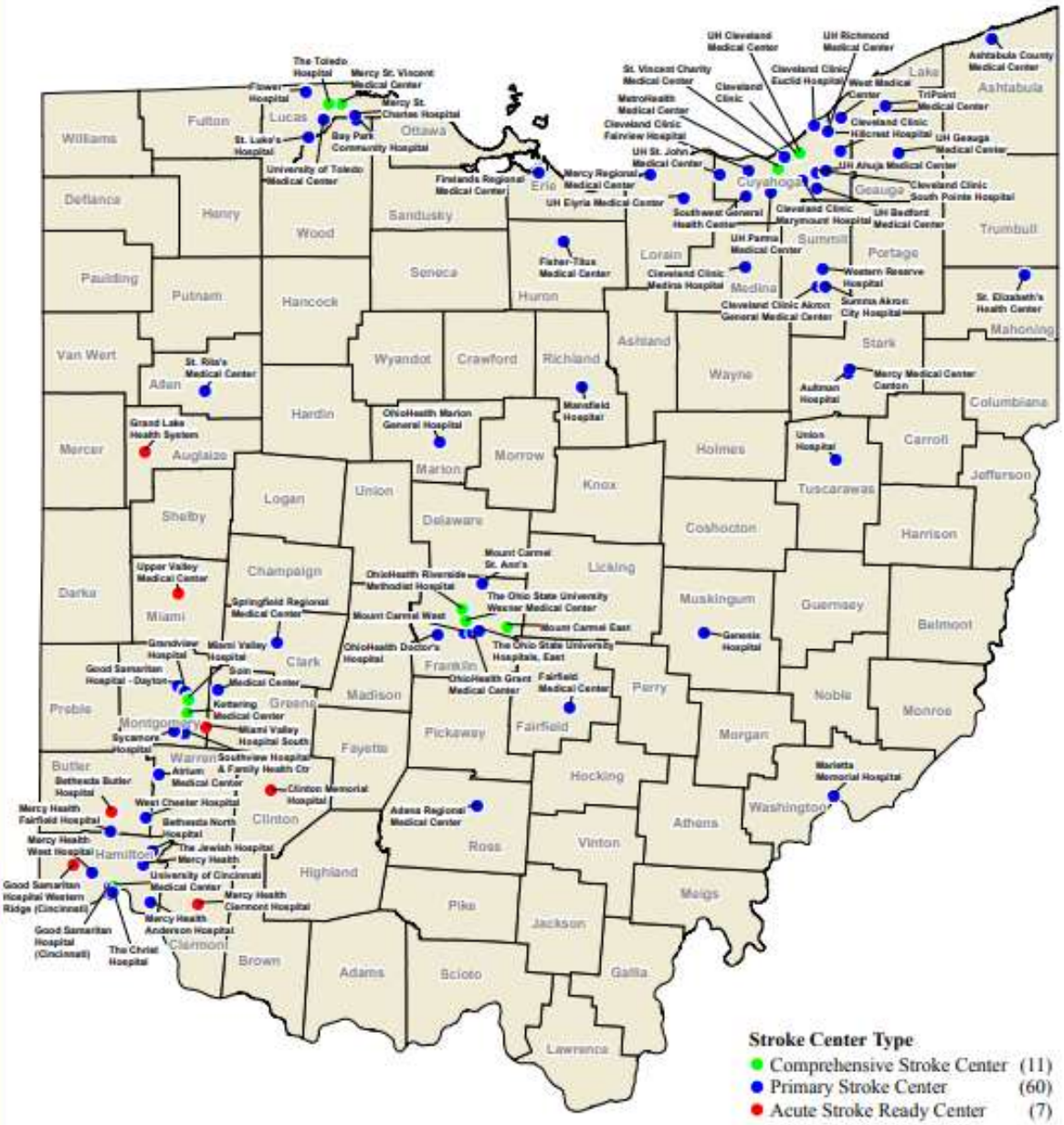
AHR	Hospital Name	Hospital Address	City	County	Zip Code	Stroke Level
1270	Aultman Health Foundation	2600 Sixth Street, SW	Canton	Stark	44710	Primary Stroke Center
1275	Summa Health System Akron City Hospital	525 E. Market Street	Akron	Summit	44304	Thrombectomy Capable Stroke Center
1276	Akron General Medical Center	1 Akron General Avenue	Akron	Summit	44307	Thrombectomy Capable Stroke Center
1280	Summa Western Reserve Hospital	1900 23rd Street	Cuyahoga Falls	Summit	44223	Primary Stroke Center
1285	Cleveland Clinic Union Hospital	659 Boulevard St	Dover	Tuscarawas	44622	Primary Stroke Center
1289	Marietta Memorial Hospital	401 Matthew Street	Marietta	Washington	45750	Primary Stroke Center
1292	Wooster Community Hospital	1761 Beall Avenue	Wooster	Wayne	44691	Primary Stroke Center
1297	South Pointe Hospital	20000 Harvard Road	Warrensville Hts	Cuyahoga	44122	Primary Stroke Center
1457	Butler County Medical Center	3125 Hamilton Mason Rd	Hamilton	Butler	45011	Primary Stroke Center
1486	West Chester Medical Center	7700 University Drive	West Chester	Butler	45069	Primary Stroke Center
1489	Miami Valley Hospital South	2400 Miami Valley Dr.	Centerville	Montgomery	45459	Acute Stroke Ready Hospital
1494	Diley Ridge Medical Center	7911 Diley Road	Canal Winchester	Fairfield	43701	Acute Stroke Ready Hospital
1497	University Hospitals Ahuja Medical Center, Inc.	3999 Richmond Road	Beachwood	Cuyahoga	44122	Primary Stroke Center
1504	Soin Medical Center	3535 Pentagon Blvd	Beavercreek	Greene	45434	Primary Stroke Center
1531	Cleveland Clinic Avon Hospital	33300 Cleveland Clinic Blvd.	Avon	Lorain	44011	Primary Stroke Center
1606	Mount Carmel St. Ann's	500 S. Cleveland Avenue	Westerville	Franklin	45409	Primary Stroke Center
1907	MetroHealth Cleveland Heights Hospital	10 Severance Circle	Cleveland Heights	Cuyahoga	44118	Acute Stroke Ready Hospital
1908	MetroHealth Parma Medical Center	12301 Snow Rd.	Parma	Cuyahoga	44130	Acute Stroke Ready Hospital
1919	Kettering Health Network - Troy Hospital	600 West Main Street	Troy	Miami	45373	Acute Stroke Ready Hospital
1103	Mercy Health St. Rita's Medical Center	730 W. Market St.	Lima	Allen	45801	Primary Stroke Center
1106	Ashtabula County Medical Center	2420 Lake Ave.	Ashtabula	Ashtabula	44004	Primary Stroke Center
1140	Southwest General Health Center	18697 Bagley Rd.	Middleburg Heights	Cuyahoga	44070	Primary Stroke Center
1173	Grant Medical Center	111 S. State St.	Columbus	Franklin	43215	Primary Stroke Center
1211	Tripoint Medical Center	7590 Auburn Rd.	Concord	Lake	44077	Primary Stroke Center
1217	University Hospitals Elyria Medical Center	630 East River St.	Elyria	Lorain	44035	Primary Stroke Center
1226	ProMedica Toledo Hospital	2142 N Cove Blvd.	Toledo	Lucas	43606	Comprehensive Stroke Center
1227	ProMedica Flower Hospital	5200 Harroun Rd.	Sylvania	Lucas	43560	Primary Stroke Center
1233	Marion General Hospital	1000 McKinley Park Dr.	Marion	Marion	43302	Primary Stroke Center
1250	Genesis Healthcare System	2951 Maple Ave.	Zanesville	Muskingum	43701	Primary Stroke Center
1268	Wilson Memorial Hospital	915 W. Michigan Street	Sidney	Shelby	45365	Acute Stroke Ready Hospital
1271	Mercy Medical Center	1320 Mercy Dr. N.W.	Canton	Stark	44708	Primary Stroke Center

*Also known as "Primary Plus Stroke Center Program" (DNV GL - Healthcare) and "Thrombectomy Stroke Certification" (HFAP)

Satellite Locations with Accreditation - Revised 6/29/2021

AHR	Hospital Name	Satellite Location Address	City	County	Zip Code
1003	Jewish Hospital	4101 Edwards Rd.	Cincinnati	Hamilton	45209
1017	Kettering Health Network - Middletown	6147 State Route 122	Middletown	Warren	45005
1024	Bethesda Arrow Springs	100 Arrow Springs Blvd.	Lebanon	Warren	45036
1031	Kettering Health Network Emergency - Franklin	100 Kettering Way	Franklin	Warren	45005
1150	MetroHealth Brecksville Health and Surgery Center	9200 Treeworth Blvd.	Brecksville	Cuyahoga	44141
1246	Preble County Medical Center ED	450-F Washington-Jackson Rd.	Eaton	Preble	45320
1246	Huber Health Center ED	8701 Old Troy Pike	Huber Heights	Montgomery	45424

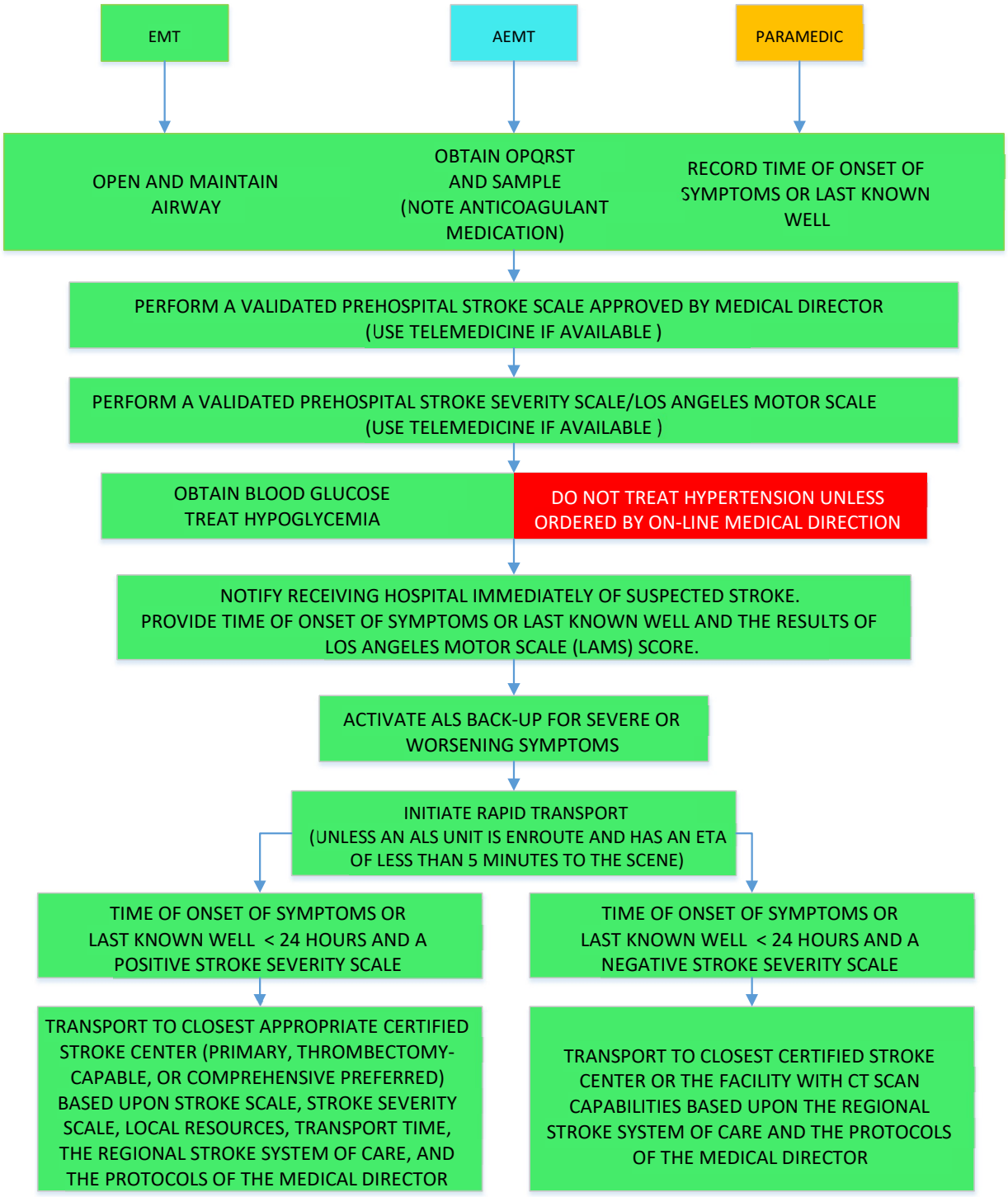
Ohio Stroke Centers



OHIO DEPARTMENT OF PUBLIC SAFETY
SAFETY · SERVICE · PROTECTION

Data Source: Ohio Emergency Medical Services
Map Design and Layout: OSHP Statistical Analysis Unit
Ohio Department of Public Safety
April 3, 2018

ACUTE STROKE



TRAUMA EMERGENCIES

GENERAL CONSIDERATIONS

1) 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.

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

3) 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:

   a) Requesting air medical evacuation from scene (see air medical transport guideline)

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

4) 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!

1) If patient is entrapped or inaccessible, contact medical direction and advise of condition and circumstances

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

EMT

1) Trauma Assessment

   a) 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

   b) Urgent patient

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

      ii) Transport immediately

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

   c) Non-urgent patient - single or non-life threatening injury

i) Focused physical exam of injured area and management of the situation.

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

iii) Transport patient

2) Urgent trauma treatment

a) Establish airway, breathing, and circulation and apply appropriate spinal care

b) Administer 100% oxygen and apply pulse oximeter

c) Control hemorrhage

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

e) During transportation

i) Splint individual fracture

ii) Evaluate the patient's:

(1) Pulses distal to the fracture site ii.
Distal skin color, temperature, neurological status

iii) Obtain relevant history:

(1) Where, when, how
(2) Mechanism of injury

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

3) Non-urgent trauma treatment

a) Establish airway, breathing and circulation, and apply appropriate spinal care

b) Administer 100% oxygen and apply pulse oximeter

c) Control hemorrhage

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

i) Evaluate the patient's:

(1) Pulses distal to the fracture site ii.
Distal skin color, temperature, neurological status

e) Obtain relevant history:

i) Where, when, how

ii) Mechanism of injury

4) Establish communications with medical direction and advise of patient condition.

AEMT

1) Assist EMS professionals; obtain patient condition and circumstance
2) Secure the airway and administer 100% oxygen. If the patient is apneic, intubate with cervical spine control
3) Start IV normal saline to maintain perfusion and systolic BP ≥ 90 mm Hg. **Establishing IV access must not delay transport.**
4) Apply cardiac monitor and check rhythm
5) If the patient is conscious and alert and complaining of severe pain, administer morphine sulfate as follows:

   a) Small frequent doses of 5 mg every 5 minutes and titrate to patient condition

   b) 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.

   c) Consider morphine or other analgesic per local protocols

PARAMEDIC

1) Assume charge of situation and confer with EMS professionals about condition of patient and situation
2) Treat for shock per the shock guideline
3) If the patient is conscious and alert and complaining of severe pain, administer morphine sulfate as follows:

   a) Small frequent doses of 5 mg every 5 minutes and titrate to patient condition

   b) 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.

   c) Consider morphine or other analgesic per local protocols

SPECIFIC INJURIES

1) Chest Wounds

   i) 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.

ii) Stabilize flail chest with trauma dressing

2) Evisceration

i) Cover organs with sterile dressing moistened with saline

ii) Lay the patient flat and elevate the knees

3) Complete Amputations

a) Control bleeding by the most appropriate method. Rapid application of a tourniquet can be lifesaving for arterial bleeding
b) Always take time to find the avulsed part, but do not delay patient transport. Transport the avulsed body part to the hospital as follows:

(1) Put avulsed body part in a cool, dry sterile dressing
(2) Avoid direct contact with ice

4) Pneumothorax / Hemothorax / Tension Pneumothorax:

i) Transport patient in position of comfort and watch for signs of a tension pneumothorax

ii) Symptoms of tension pneumothorax:

(1) Chest pain or evidence of trauma
(2) Tachypnea
(3) Tachycardia
(4) JVD
(5) May initially exhibit hypertension progressing to hypotension
(6) Hyperresonance on affected side
(7) Diminished or absent breath sounds of affected side
(8) Audible wheeze
a. Tracheal deviation away from affected side (latent sign)

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

1. Pleural decompression per procedure

6) Head Injury:

i) Evaluate patient condition:

(1) Level of Consciousness
(2) Pupillary size and reaction
(3) Glasgow Coma Scale

ii) Transport with head elevated 8 to 10 inches by tilting backboard with the cervical spine immobilized

iii) Maintain airway and support with 100% oxygen by NRB mask and/or BVM

(1) 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

(2) Do not hesitate to take control of airway

(3) Hyperoxygenate when there are signs of cerebral herniation:

i. Dilated pupils, bradycardia, posturing

7) 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
   b. Falls greater than 10 feet

2. Place patient in a cervical collar if any of the following are present:
   (2) The patient complains of midline neck or spine pain
   (3) Any midline neck or spinal tenderness with palpation
   (4) Any abnormal mental status (including extreme agitation)
   (5) Focal or neurologic deficit
   (6) Any evidence of alcohol or drug intoxication
   (7) Another severe or painful distracting injury is present
   (8) Torticollis in children
   (9) A communication barrier that prevents accurate assessment
   (10) If none of the above apply, the patient may be managed without a cervical collar

i) 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.

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

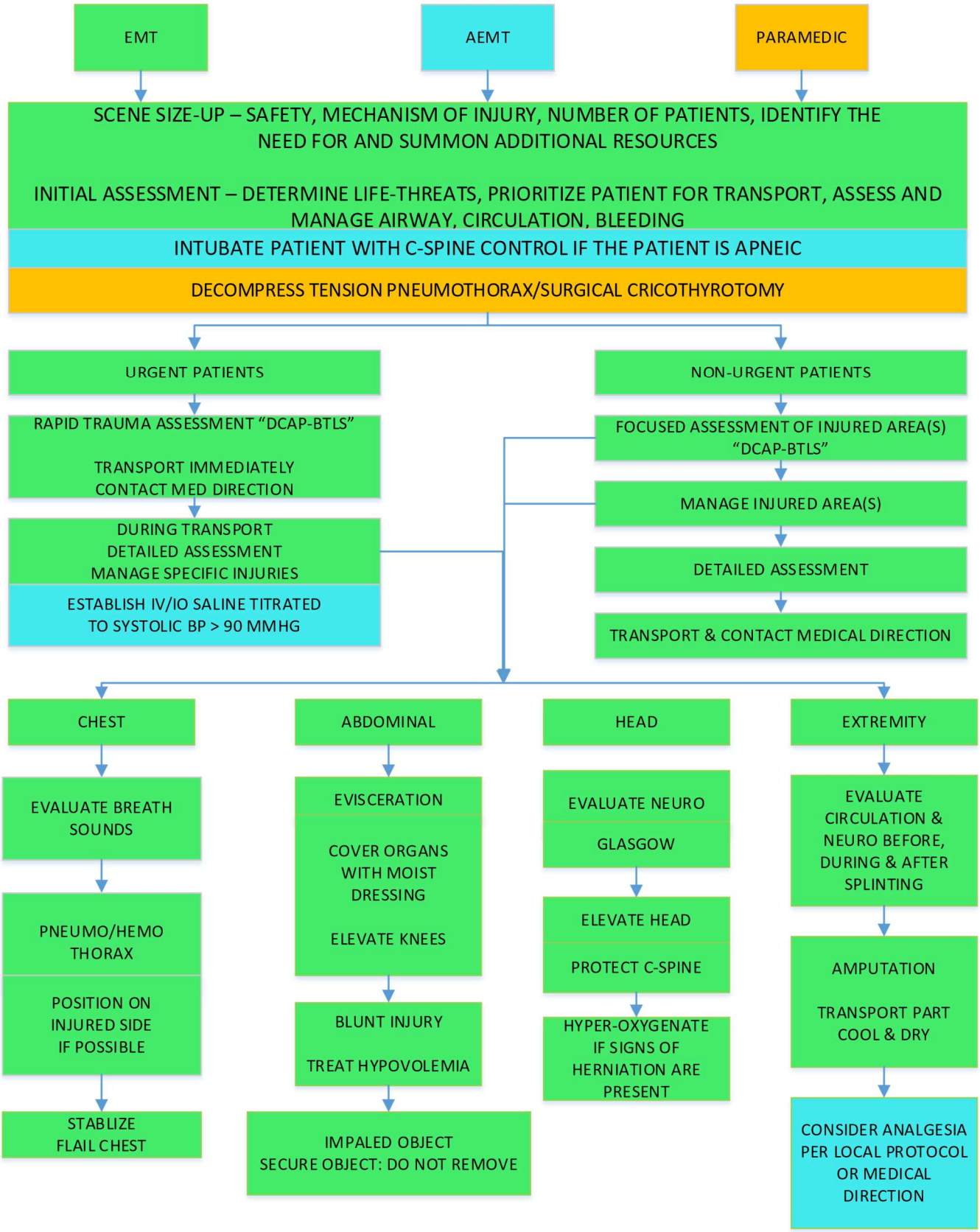
iii) Do not transport patients on rigid long boards unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In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

iv) 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.

v) 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.

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

TRAUMA EMERGENCIES



TRAUMA ARREST

GENERAL INFORMATION

1) 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.

2) 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.

3) 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

1) 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

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

3) Always consider a potential cervical spine injury and provide appropriate spinal care

4) Provide CPR with consideration of cervical spine

5) Transport immediately

AEMT

1) Assist EMS professionals and obtain patient condition and circumstance

2) Establish IV or IO of normal saline and transport to the hospital

3) Check pulse, intubate patient, contact medical direction, and advise of patient condition while continuing CPR

PARAMEDIC

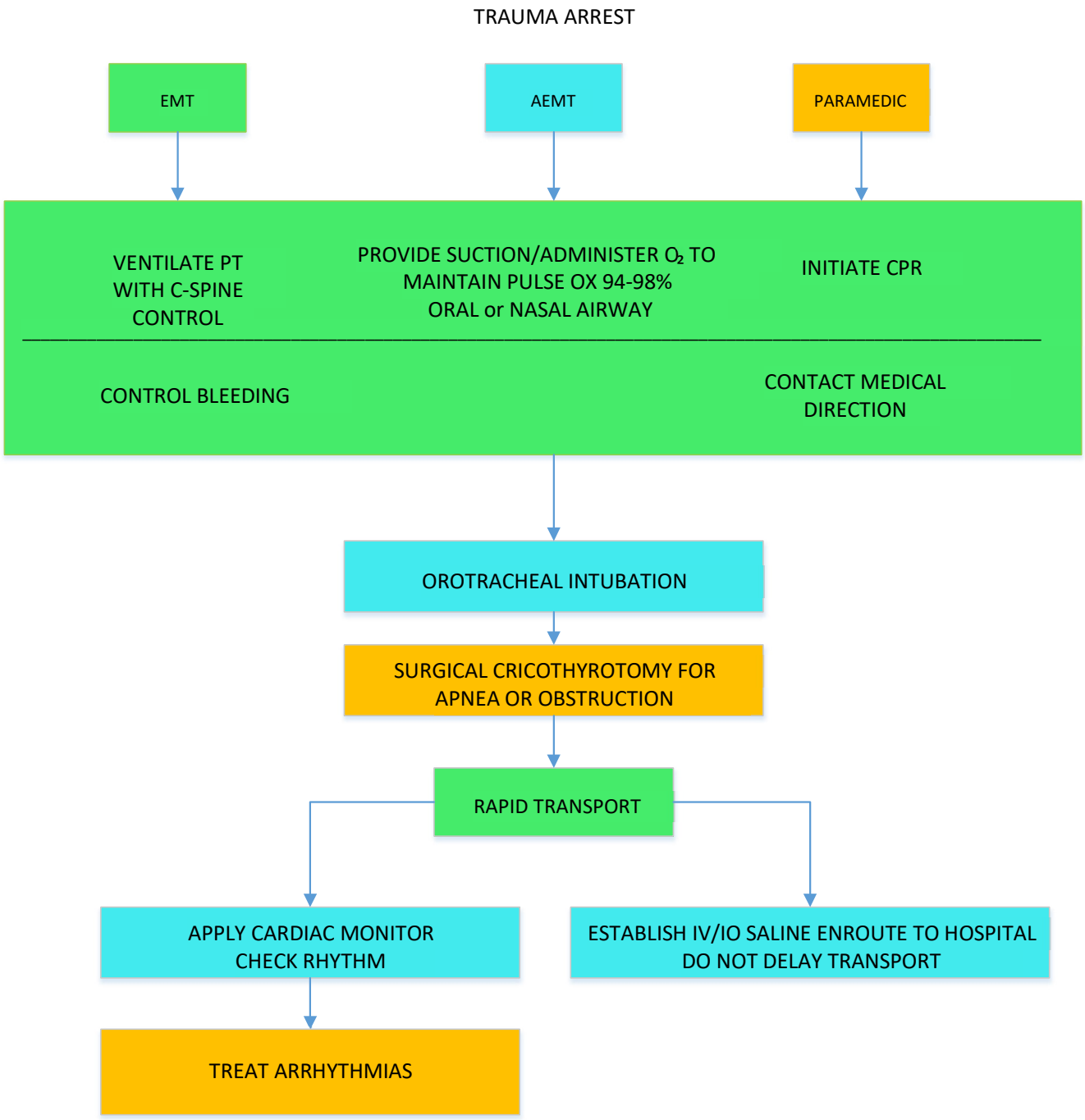
1) Assume charge and confer with EMS professionals as to patient condition and circumstances

2) Intubate patient:

    a) Patients should be intubated orotracheally without movement of the cervical spine

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

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



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/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

1) 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
2) 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
3) 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
4) 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.
5) 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

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

2) Elder Abuse and Maltreatment:
   a) 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
   b) Patients with dementia are at the greatest risk of abuse with approximately 50% having experienced maltreatment by their caregivers

3) Human Trafficking:
   a) The second fastest growing criminal industry in the United States
   b) Emergency departments are the primary source of medical care for victims as it facilitates the avoidance of detection and tracking
   c) Victims rarely presents a government-issued form of identification
   d) 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
   e) 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

AIR MEDICAL TRANSPORT

1) Air medical services may be requested directly to the scene by:

   a) An on-scene EMS organization

   b) Hospitals and healthcare facilities

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

   a) 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

   b) 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

3) 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

4) 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
   a) appropriate resources is based upon, but not limited to, the following factors:

   b) Time to definitive care

   c) Capabilities of the receiving medical facility

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

   e) Patient's wishes

   f) Family continuity

COMMUNICATIONS

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. The following patient report triage system is a sample matrix and merely an example of one of many systems that exist.

Code Three patients – Most seriously ill or injured

This category is for the most seriously ill or injured patients, patients with a time-critical diagnosis, or those in cardiac arrest.

1. Type of squad: EMT, AEMT, Paramedic
2. Age and sex of patient:
3. Type of situation: Injury and/or illness

4. Specific complaint: Concise with pertinent information (e.g., chest pain, skull fracture)
5. Mechanism of injury: MVC / MCA / fall
6. Vital signs and patient assessment: BP / pulse / respirations / LOC / EKG
7. Patient care: Airway management, circulatory support, drug therapy
8. General impression: Stable or unstable
9. ETA to medical facility

Code Two patients – Significantly ill or injured
This category is for individuals who have significant signs or symptoms of illness or injury and, at this time, are stable.

1. Type of squad: EMT, AEMT, Paramedic
2. Age and sex of patient:
3. Type of situation: Injury and/or illness
4. Specific complaint: Concise with pertinent information (e.g., 10% 2nd degree burn to leg)
5. Mechanism: MVC / MCA / fall
6. Vital signs and patient assessment: BP / pulse / respirations / LOC / EKG
7. ETA to medical facility

Code One

patients – Minor illness or injury

This category covers all minor illness or injury circumstances and the patient is in no danger of developing any significant life-threatening signs or symptoms.

1. Type of squad: EMT. AEMT, Paramedic
2. Age and sex of patient:
3. Type of situation: Injury and/or illness
4. Specific complaint: Concise with pertinent information (e.g., abdominal pain for two weeks)

Code One (non-transport) for minors

If after evaluation of a minor, the EMS professional and medical direction agree that the patient is a Code One, 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 direction and the EMS professional.

Once the above information is given, wait for further requests and/or orders from medical direction.

If the patient requires special care; (i.e., security; interpreter; additional people for lifting, isolation for infection, vermin infestation, or hazardous material) this information should also be relayed.

<u>Examples of Patients According to Triage Priority</u>

Code Three patients

Airway and/or breathing difficulty
Altered LOC
Cardiac arrest
Circulation difficulty (bleeding and/or shock)
Complicated childbirth
Chest pain
Multiple fractures
Open chest and abdominal injury
Severe burns
Severe head injury
Severe poisoning
Status epilepticus
Time-critical diagnosis
Unconsciousness

Code Two patients

- Acute abdominal pain
- Cervical spine injury
- Moderate burns
- Normal childbirth
- Psychiatric
- Violent and/or uncooperative patient

Code One patients

- Minor illness
- Minor injury

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:

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

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

3) Signs of decomposition, rigor mortis, or dependent lividity

4) 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

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

6) 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.

DO NOT RESUSCITATE/PALLIATIVE 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 CareArrest 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 the patient's attending physician. **NOTE: Pursuant to Ohio Revised Code 4765.35(D)(1), 4765.37(D)(1), 4765.38(C)(1), and 4765.39(C)(1), certified Ohio EMS providers shall only accept written orders from a physician or cooperating physician advisory board. DNR orders signed by advanced practice registered nurses of physician assistants are not valid for EMS providers.**
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 or CNP/CNS issuing a verbal DNR order. Acceptable methods of verification include personal knowledge of the physician or CNP/CNS, a return telephone call to verify the information provided, or a list of practitioners with other identifying information such as addresses.

A DNR order is considered current if it is present in a health care facility's records or patient chart. A DNR 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 order. EMS providers are not required to research whether a DNR 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, 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/PA)

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

1. Perform CPR
2. Insert artificial airway adjunct
3. Administer resuscitation medications with the intent of restarting the heart or breathing
4. Defibrillate, cardiovert, or initiate pacing
5. Provide respiratory assistance other than the methods listed above.
6. 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.

PATIENT REFUSAL

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, competency refers to the mental capacity to make medical decisions and not to the legal definition of competency.

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. 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.

1) Consent

    a) 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. <u>In no event should legal consent procedures be allowed to delay immediately required treatment.</u>

    b) A 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.

2) Mental competence – Decision-making capacity

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

    b) 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.

3) Impairment – Patient may be considered incompetent to refuse care and/or transport when they appear impaired. Factors that may cause a patient to be impaired include, but are not limited to:

    a) Suicidal ideation

    b) Alcohol intoxication

    c) Illicit drugs

    d) Prescription and non-prescription drugs

    e) Medical conditions
        i) Hypoglycemia
        ii) Hypoxemia
        iii) Hypoperfusion
        iv) Head trauma
        v) Psychiatric conditions

4) Pediatric patients

   a) A critically ill or injured child should be treated and transported immediately

   b) 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.

   c) 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

1) 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 nontransport protocols.**

2) 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.

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

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

   b) 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.

   c) 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.

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 _____

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: _____ NON-TRANSPORTS

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.

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 Professional'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.

1) 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.

2) 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.

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

4) 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.

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

6) 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.

7) 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.

8) 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, telephoneaccessible 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 AT THE SCENE

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:

a) Medical direction must be informed and give approval.

b) 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.

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

d) 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

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

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

c) 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.

d) Once the patient has been transferred into the transport vehicle, the patient’s care becomes entirely under medical direction.

MANAGEMENT OF AGITATED/VIOLENT PATIENTS AND BEHAVIORAL EMERGENCIES

GENERAL GUIDELINES

1) Soft physical management devices are to be used only when necessary in situations where the patient is
   a) 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:

   b) Head trauma
   c) Alcohol/drug related problems
   d) Metabolic disorders (i.e., hypoglycemia, hypoxia, etc.)
   e) Psychiatric/stress related disorders

2) 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.

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

4) 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.

   a) Patients should be transported in the supine or decubitus position to ensure adequate respiratory and circulatory monitoring and management. The prone position should be a position of last resort and rarely used. All patients who require physical and/or pharmacologic management should be placed on a stretcher with adequate foam padding particularly underneath the head if the patient is positioned in the prone position. 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.

5) 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.

6) 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.

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

a) Reason for physical and/or pharmacologic management
b) Agency responsible for the application of the physical management device (i.e., EMS, police)
c) Dcumentation of serial cardio-respiratory status and peripheral neurovascular status

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:

a) When directed by medical direction.

b) If specifically authorized by on-line medical direction.

c) When the EMS unit is following protocols approved by medical direction.

d) 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.

e) 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 nonhospital 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.

INTERFACILITY PATIENT TRANSPORT GUIDELINES

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.

TERMINATION OF RESUSCITATION EFFORTS

"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.

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.

MOBILE INTEGRATED HEALTHCARE

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.

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 intercostal 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:

- Diminished or absent lung sounds
- Cyanosis and difficulty breathing
- Distended neck veins
- Tachycardia, tachypnea, hypotension, narrow pulse pressure
- Tracheal shift to the unaffected side (May not always be present)

PROCEDURE

1) 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.
2) Locate site:

    a) Second or third intercostal space at the midclavicular line

    b) Fourth intercostal space between the fourth and fifth rib at the midaxillary line

3) Cleanse the insertion site, if time permits

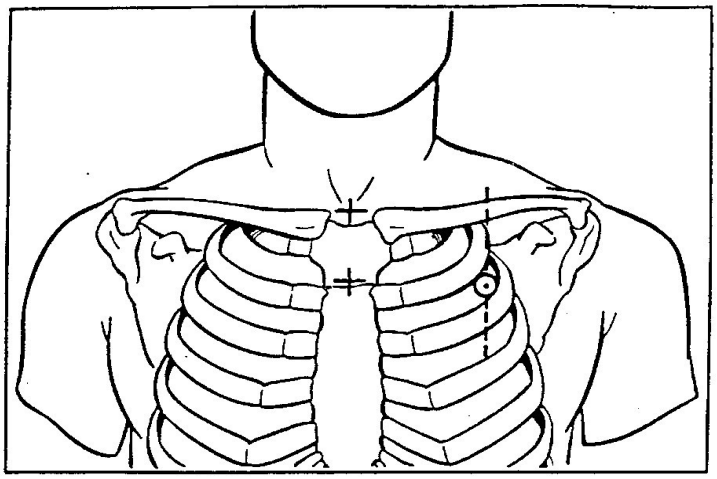
4) Insert the needle just superior to the rib until a rush of air is felt and/or heard

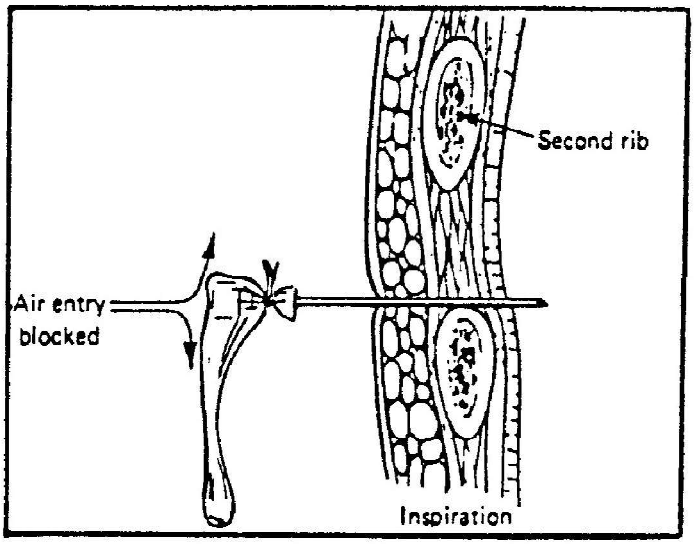
5) Secure needle in place

6) Support patient with 100% oxygen and transport without delay

CONTRAINDICATIONS

A. Insufficient training completed by the EMS provider.





CHEST TUBE MONITORING

Chest tubes, which drain intrathoracic air or fluid, are positioned in the fourth or fifth intercostal space at the midaxillary 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:

- Any patient who is complaining of shortness of breath for reasons other than pneumothorax or chest trauma
- Is awake and oriented
- Has the ability to maintain an open airway (GCS>10)
- Has a respiratory rate greater than 25 breaths per minute
- Has a systolic blood pressure above 90 mmHg
- 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:

a) Assess patient for signs / symptoms of pneumothorax
b) Place patient in a sitting position
c) Assess vital signs and SpO_2 frequently
d) AEMT and Paramedic: Attach ECG monitor
e) If the systolic BP is <90 mm Hg, contact medical direction prior to initiating CPAP
f) 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).
g) For CHF or pulmonary edema, titrate to 10 cm H_2O. For all other SOB, titrate to 5 cm H_2O
h) Check for air leaks
i) Treatment should be given continuously throughout transport to the emergency department.

j) Continue to coach patient to keep mask in place and readjust as needed
k) If respiratory status or level of consciousness deteriorates, remove device and begin bag valve mask ventilation.
l) Documentation on the patient care record should include:
    (1) CPAP level
    (2) Frequent SpO_2 and vital sign assessment
    (3) Response to treatment
    (4) 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

CRICOTHYROTOMY – NEEDLE/SURGICAL

INDICATIONS

Unable to intubate by another route. This may be seen with:

- Cervical spine injuries
- Maxillofacial trauma
- Laryngeal trauma
- Oropharyngeal obstruction from:
    - Edema from infection, caustic ingestion, allergic reaction, and/or inhalation injuries
    - Foreign body
    - Mass lesion
- Orotracheal or nasotracheal intubation is contraindicated for any reason

COMPLICATIONS

- Postoperative bleeding
- Late bleeding
- Abscess behind packing
- Cellulitis of neck
- Subcutaneous emphysema
- Voice change
- Feeling of lump in throat
- Persistent stoma
- Obstructive problems
- Misplacement of the airway

NEEDLE CRICOTHYROTOMY PROCEDURE

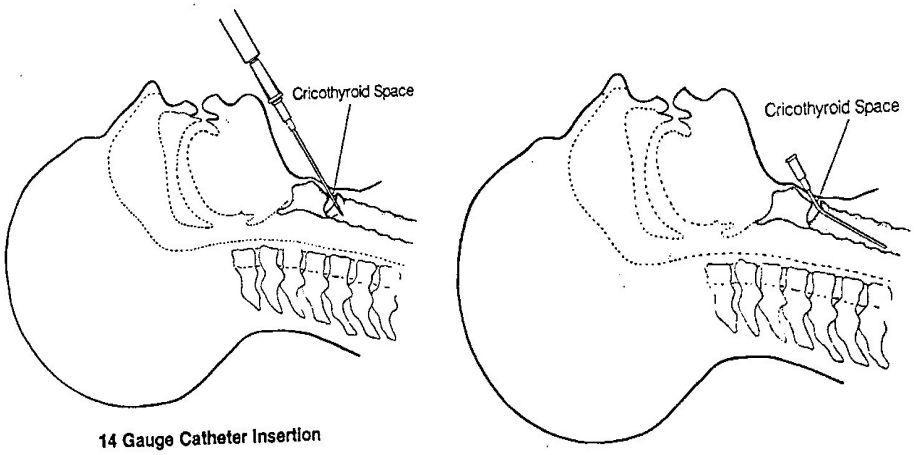
If time permits, prep the area with appropriate antiseptic solution. Attach a large angiocath (14-16 ga) to a syringe, and insert the needle through the cricothyroid membrane (CTM) and aspirate. Aspiration of air indicates proper placement.

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

- Esophageal intubation
- Tracheal rupture
- Right mainstem bronchus intubation
- Broken teeth
- Laryngospasms
- Trauma to the oropharynx
- Trauma or puncture of trachea due to misplacement of stylet
- Hypotension
- Peri-intubation hypoxia
- Patient decompensation/deterioration

OROTRACHEAL INTUBATION

1) Always begin artificial ventilation as soon as possible using a bag-valve-mask or oxygen powered manually triggered or automatic transport ventilation device.

2) Assemble and ready equipment:

    a) Endotracheal tubes of various sizes
    b) Laryngoscope and blades
    c) Malleable stylet
    d) Magill forceps
    e) 10 ml syringe
    f) Suction apparatus and catheters
    g) Water soluble lubricant
    h) ET tube tape
    i) Oropharyngeal airway

3) 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.
4) Assemble laryngoscope and check bulb
5) 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.

6) 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

7) Suction the mouth and the pharynx

8) Visualize the epiglottis and vocal cords

9) 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

10) Remove laryngoscope and stylet (if used), holding the tube securely with the right hand

11) Attempt to ventilate with a bag-valve-mask and check for breath sounds in both lungs

12) 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.

13) Maintain ventilation until adequate respirations resume or victim is delivered to an emergency department

14) Recheck lungs sounds and verify tube placement each time patient is moved or every 10 minutes

15) Document the intubation by noting the following:
    a) Number of attempts to achieve successful intubation
    b) Person(s) making attempts
    c) Size of tube used
    d) Type of laryngoscope blade used on each attempt
    e) Lung sounds before intubation
    f) Lung sounds after intubation and time of each check
    g) Measurement on tube at lips of patient when lung sounds are present
    h) Any complications
    i) End tidal CO_2, digital capnometry measurement, and/or waveform capnography
    j) Pulse oximetry
    k) 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:

1) Explain the procedure to victim

2) Prepare suction equipment with large-bore catheter and suction secretions from endotracheal tube, mouth, and pharynx

3) 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:

   a) 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*

   b) Positive pressure is administered with a hand-held ventilator and, at the end of deep inspiration, the cuff deflated, and the tube rapidly removed

4) Prepare to suction secretions and gastric content if vomiting occurs

5) Appropriate oxygen is then administered

6) 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.

7) 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:

	e (mm) – Uncuffed	e (mm) – Cuffed
mature		
m to 3 months		
months		
6 months		
24 months		
6 years	e(yr)/4]+4	e(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

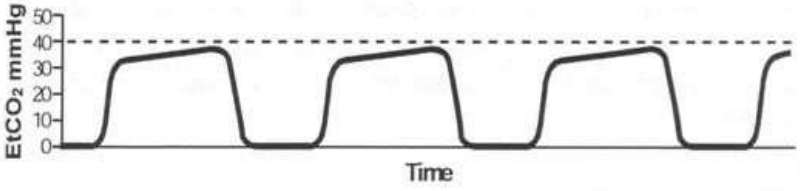
Waveform capnography provides continuous numeric measurement of CO_2 levels during both the inhalation and exhalation phases of respiration. Waveform capnography also has the benefit of providing a graphic image of the level and pattern of carbon dioxide exchange.

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

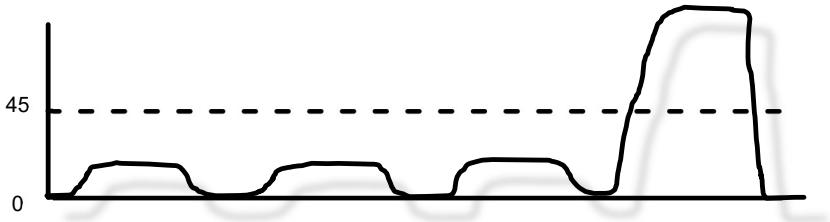
in the end tidal CO_2 to a level greater than 30 millimeters of mercury may indicate the return of spontaneous circulation.

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.

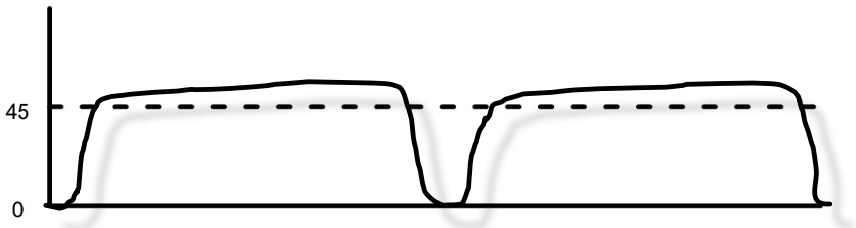
This is an example of the morphology seen on a capnograph from a patient with a normal ventilation and perfusion status.



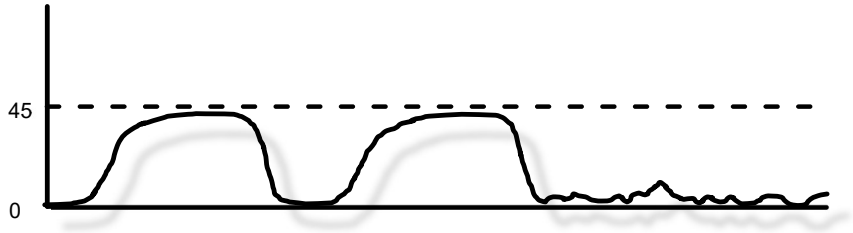
This is an example of the morphology seen on a capnograph when there is return of spontaneous circulation following a cardiac arrest.



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.

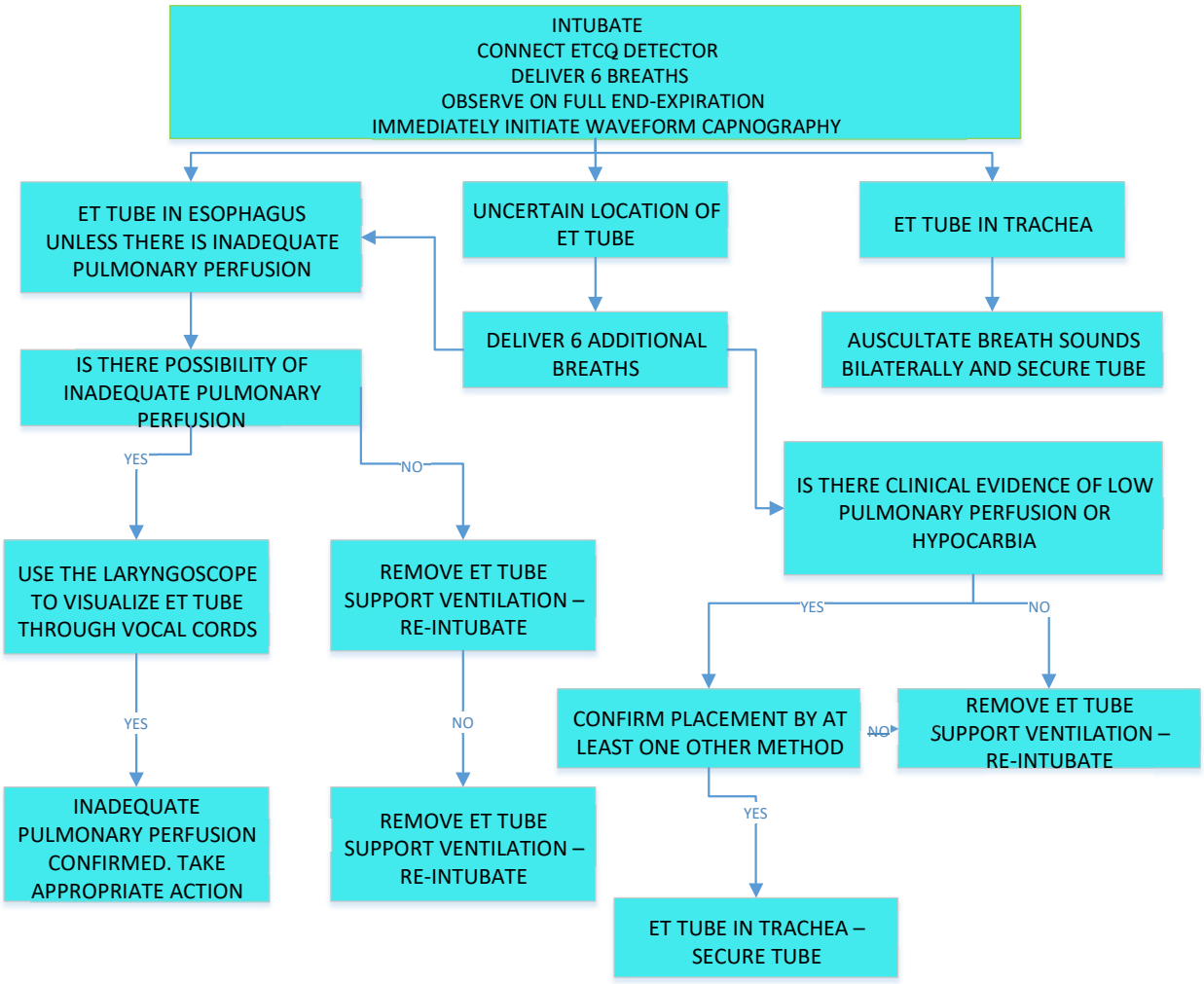
Procedure for use:

1) Remove the end tidal CO_2 detector from package (Do not remove end caps until ready to use device)
2) Remove end caps immediately before use and shake device to introduce room air

3) 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.

4) Insert endotracheal tube (Inflate cuff if tube is equipped with one)
5) Firmly attach the end tidal CO_2 detector between the endotracheal tube and the breathing device
6) 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.
7) Compare the color of the indicator on full end-expiration to the color chart on the product dome.
8) 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.
9) **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.
10) This device is not to be used for:

    a) Detection of hypercarbia
    b) Detection of mainstem bronchial intubation
    c) During mouth-to-tube ventilations


INTUBATE
CONNECT ETCO2 DETECTOR
DELIVER 6 BREATHS
OBSERVE ON FULL END-EXPIRATION
IMMEDIATELY INITIATE WAVEFORM CAPNOGRAPHY
ET TUBE IN ESOPHAGUS UNLESS THERE IS INADEQUATE PULMONARY PERFUSION
UNCERTAIN LOCATION OF ET TUBE
ET TUBE IN TRACHEA
IS THERE POSSIBILITY OF INADEQUATE PULMONARY PERFUSION
DELIVER 6 ADDITIONAL BREATHS
AUSCULTATE BREATH SOUNDS BILATERALLY AND SECURE TUBE
YES
NO
IS THERE CLINICAL EVIDENCE OF LOW PULMONARY PERFUSION OR HYPOCARBIA
USE THE LARYNGOSCOPE TO VISUALIZE ET TUBE THROUGH VOCAL CORDS
REMOVE ET TUBE SUPPORT VENTILATION – RE-INTUBATE
YES
NO
CONFIRM PLACEMENT BY AT LEAST ONE OTHER METHOD
NO
REMOVE ET TUBE SUPPORT VENTILATION – RE-INTUBATE
YES
INADEQUATE PULMONARY PERFUSION CONFIRMED. TAKE APPROPRIATE ACTION
REMOVE ET TUBE SUPPORT VENTILATION – RE-INTUBATE
ET TUBE IN TRACHEA – SECURE TUBE

EXTERNAL PACEMAKER

INDICATIONS

An external pacemaker may be used in the following situations:

- 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.

- 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.

- Additional patients at the discretion of the on-line medical direction physician

APPLICATION

1) 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.

2) 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.

3) Once electrical capture is achieved, check for mechanical capture, i.e. the presence of a pulse.

4) If capture occurs, reassess peripheral pulses and vital signs.

5) On-line medical consultation is indicated for all pediatric patients prior to using an external pacemaker.

6) Remove nitroglycerin patches and other transdermal patches or pads prior to using an external pacemaker.

7) Consider providing sedation to fully conscious patients prior to pacing

8) Patients who are initially unconscious may require sedation after treatment due to improving mental status.

9) 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

1) Prepare equipment
2) The initial attempt should be at a site on the extremity as distal as practical
3) Apply tourniquet
4) Cleanse site with the appropriate antiseptic
5) Attach IV tubing
6) Secure IV using appropriate measure to insure stability of the line

7) Check for signs of infiltration
8) Adjust flow rate
9) Document IV procedure on run sheet.

MECHANICS FOR STARTING EXTERNAL JUGULAR IV LINE

1) Locate external jugular vein
2) Cleanse site with the appropriate antiseptic
3) Select IV catheter
4) Position yourself at patient's head
5) Turn patient's head so as to maximally expose vein and minimize interference of jaw
6) Cannulate the vein by directing the needle caudal at an angle nearly parallel to the neck
7) Attach IV tubing
8) Secure IV using appropriate measures to insure stability of the line
9) Check for signs of infiltration
10) Adjust flow rate
11) Document IV procedure on run sheet.

MECHANICS OF STARTING SALINE LOCK

1) Prepare equipment: Attach pre-pierced adapter to extension tubing, Inject saline (approx. 1 ml) in to tubing and leave syringe attached to tubing

2) The initial attempt should be on the extremity distal as practical

3) Apply tourniquet

4) Cleanse site with the appropriate antiseptic

5) Attach IV tubing and push the remaining saline through the tubing and catheter. Remove syringe.

6) Secure IV using appropriate measure to insure stability of the line

7) Check for signs of infiltration

8) Document IV procedure on run sheet.

DOCUMENTATION

ALL IV attempts must be recorded on run sheet and include the following:

1) When successful:

    a) Time IV was started
    b) Type and amount of solution hung and infused during run
    c) Flow rate
    d) Size of catheter or needle used
    e) Location of IV site
    f) Initials of all EMS professionals who attempted and/or started IV
    g) Signature of EMS professionals in-charge of run

2) When unsuccessful:

    a) Time IV was attempted
    b) Type of solution
    c) Size of catheter or needle used
    d) Location of attempted site
    e) Initials of all EMS professionals who attempted and/or started IV
    f) Signature of EMS professionals in-charge of run

3) Record all IV medications given

    a) Name of medication
    b) Dosage and amount given
    c) Time ordered (if applicable)
    d) Time given
    e) Initial of all EMS professionals who administered medication
    f) 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

1) Prepare as for a surgical procedure, using sterile technique
2) Attempt to have feet in flexed position against board or sandbag
3) If the patient is alert, consider using a local anesthetic
4) The preferred site is the proximal anteromedial tibia, 1-3 cm below the tibial tuberosity
5) 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
6) E. 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.

7) 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.

8) The needle should feel firm in position and stand upright without support.

9) Infusion via this route is the same as venous access without limit to rate of administration, drugs pushed or fluid type infused.

10) After removing needle (for successful or unsuccessful attempt), apply pressure to area for five minutes and apply dressing to area.

11) Intraosseous infusions of fluid may cause subcutaneous infiltration, osteomyelitis or subcutaneous infections.

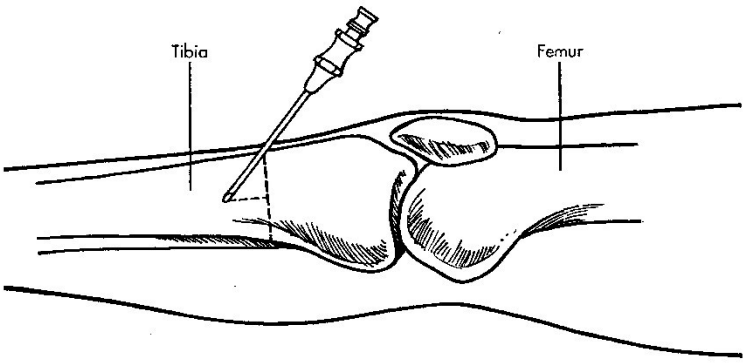


Figure 3-58 Proximal tibial site for intraosseous infusion.

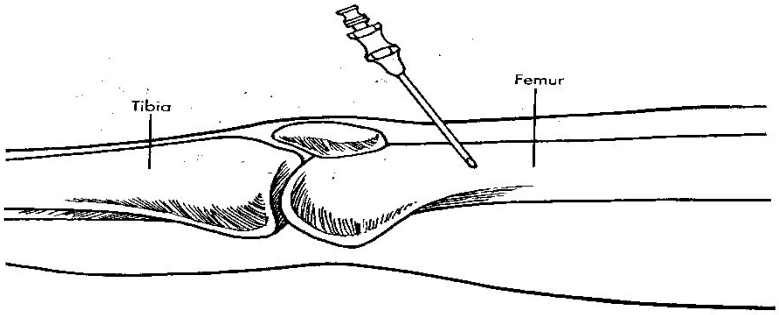


Figure 3-60 Distal femur site for intraosseous infusion.

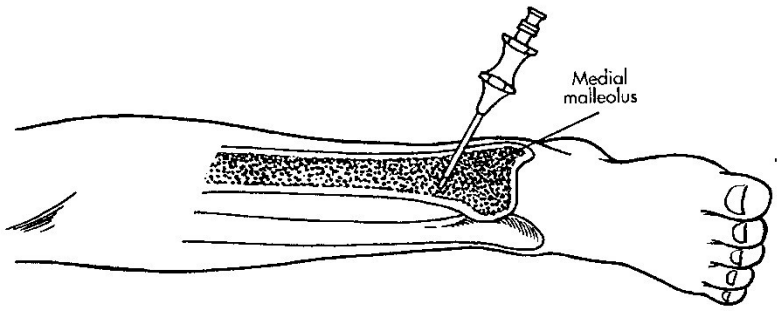


Figure 3-59 Distal tibial site for intraosseous infusion.

MAINTENANCE OF BLOOD TRANSFUSIONS

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 antigenfree 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 Rhpositive blood. Once the antibodies against the Rh-positive antigen are formed, the patient with Rhnegative 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, Onegative 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.

PULSE OXIMETRY

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

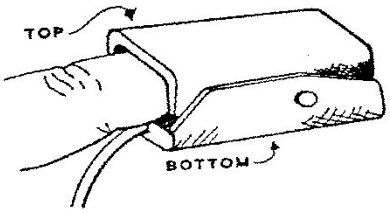
PROCEDURE

1) Select the sensor and apply according to manufacturer's recommendations. The following should be noted:

    a) 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.

        i) 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.

        ii) 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)

a) Flex sensor - This sensor is designed for monitoring pediatric and adult patients in which moderate patient movement is expected.

i) 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.

ii) 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

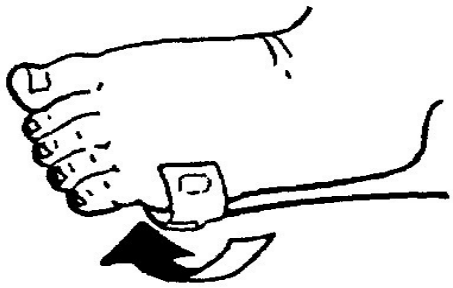
3)

a) Infant and neonatal sensors - These sensors are designed for continuous monitoring of infants and neonates since fingertip monitoring is impractical.

i) The infant sensor is designed for application on the big toe of infants that weight greater than 2 kilograms (5 pounds).

ii) The neonatal sensor is designed for application on the foot of infants that are less than 2 kilograms in weight.

iii) 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

b) 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.

c) Reflectance sensor - This sensor is used on well-vascularized skin surfaces in adult patients only. This method is not preferred in the prehospital setting.

4) Turn the oximeter on and verify operation according to manufacturer's operating procedure.

5) A relative operation check can be achieved by applying the sensor to your own finger.

6) 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.

7) Apply sensor to patient and obtain reading.

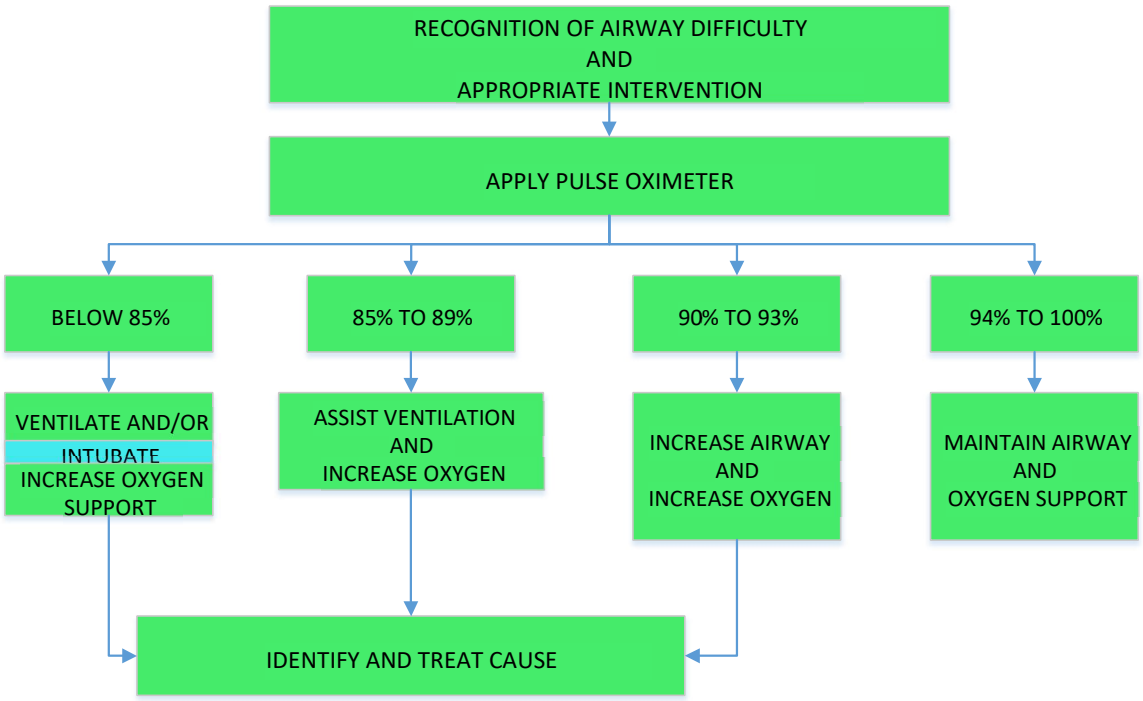
i) Interpretation of reading:

(1) 100% to 94% Ideal range - Maintain oxygen and airway support methods being used

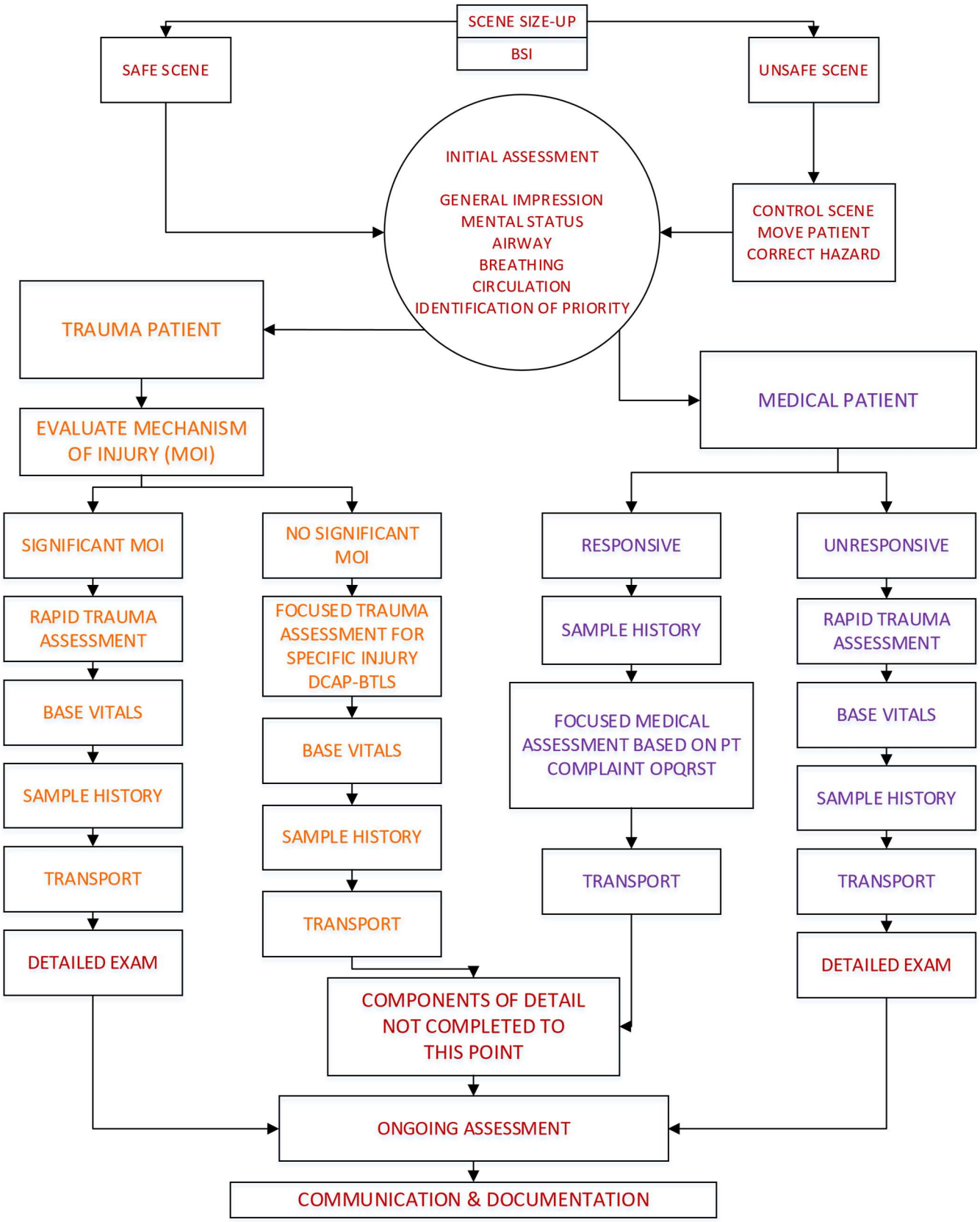
(2) 93% to 90% Mild to moderate hypoxemia - Check airway and increase oxygen support until ideal range is achieved

(3) 89% to 85% Severe hypoxemia - Aggressive airway and oxygen support is essential Look for and treat cause: i.e. COPD, metabolic imbalance, peripheral vascular shutdown

(4) 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
RAPID TRAUMA ASSESSMENT
BASE VITALS
BASE VITALS
FOCUSED MEDICAL ASSESSMENT BASED ON PT COMPLAINT OPQRST
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
- 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)
- Oxygen (O_2)
- Procainamide
- Sodium bicarbonate
- Sotalol (Betapace®)
- Tranexamic acid (TXA)
- Vasopressin (Pitressin®)

PHARMACOLOGY REVIEW

1) ACTIONS OF DRUGS
    a) Local effects
    b) Systemic effects

2) EFFECTS DEPENDS UPON
    a) Age of patient
    b) Condition of patient
    c) Dosage
    d) Route of administration

3) ROUTE OF ADMINISTRATION

    a) Intravenous (IV)
        i) Most rapidly effective
        ii) Most dangerous
        iii) Should be given slowly through an established IV line

    b) Intramuscular (IM)

        i) Longer time to initial clinical effect
        ii) Longer duration of action
        iii) Deltoid or gluteus maximus Site
        iv) Absorption very dependent on blood flow

    c) Subcutaneous (SQ)

        i) Slower and more prolonged absorption
        ii) Best administered under the skin of the upper arms, thighs, or abdomen

    d) Inhalation

        i) Bronchodilators
        ii) Steroids

    e) Endotracheal

        i) Epinephrine, atropine, lidocaine, diazepam, or naloxone
        ii) Dilute usual IV dose with 10 ml of sterile water for the administration of these drugs

    f) Sublingual (SL)
        i) Rapid absorption

    g) Oral

        i) Ipecac
        ii) Charcoal

h) Rectal

i) Rapid but unpredictable absorption

i) Intranasal (IN)

i) Rapid and non-invasive administration
ii) Viable route of administration for non-medical responders and laypersons

j) Intraosseous

i) Rapidly established route when IV placement cannot be completed
ii) Rapid absorption of medications into the blood stream nearly equivalent to IV route

k) Intracardiac

i) Dangerous
ii) No advantage over IV or endotracheal routes
iii) Dilute usual IV dose with 10ml of sterile water

4) RATES OF ABSORPTION

a) Directly related to route of administration

1. IV - - Fastest
   IN ↓
   IM ↓
   SQ ↓
   Oral -- Slowest

5) ELIMINATION

a) Many methods
b) Usually metabolized by the liver
c) Eliminated by the kidneys, lungs, skin

6) 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

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

7) AUTONOMIC NERVOUS SYSTEM

8) Controls automatic or involuntary actions

a) Parasympathetic - Controls vegetative functions

b) Sympathetic - "Flight or fight"

9) PARASYMPATHETIC NERVOUS SYSTEM

a) Mediated by vagus nerve

b) Acetylcholine is transmitter (cholinergic)

c) Atropine is acetylcholine blocker

10) SYMPATHETIC NERVOUS SYSTEM

a) Mediated by nerves from sympathetic chain

b) Norepinephrine is an adrenergic transmitter

c) Epinephrine is released from adrenals

11) SYMPATHETIC RECEPTORS

a) Alpha (α)

b) Beta (β)

12) 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

13) SYMPATHETIC BLOCKERS

a) Propranolol (Inderal®) - β blocker

14) XIII.DRUG ADMINISTRATION

15) 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

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

AMIODARONE

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 <u>when accompanied by hypotension</u>

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 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 <u>intravenously</u> for bradycardia
For organophosphate poisoning, a combination of intravenous and <u>intramuscular</u> administration is commonly used

In resuscitation from cardiac arrest, if an intravenous route cannot be established, atropine may be given through the <u>endotracheal</u> tube **ATROPINE SULFATE** (cont)

ADULT DOSAGE: <u>In bradycardia</u>: 0.5 mg IV, repeated at 5-minute intervals until the desired heart rate is achieved

<u>The total dose should not, however, exceed 3 mg</u>. (Except in organophosphates)

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, 1mg IV, repeated in 5 minutes if asystole persists.

* For organophosphate poisoning: 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

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 70 with Glucometer in symptomatic patients:

to treat coma caused by HYPOGLYCEMIA; to

treat COMA OF UNKNOWN CAUSE;

to treat STATUS EPILEPTICUS OF UNCERTAIN CAUSE; and some cases of REFRACTORY CARDIAC ARREST

CONTRAINDICATIONS: Avoid in cases of presumed intracranial hemorrhage

SIDE EFFECTS:

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.

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 70 with glucometer in symptomatic patients:

Treatment of coma caused by HYPOGLYCEMIA;

Treatment of COMA OF UNKNOWN CAUSE;

Treatment of STATUS EPILEPTICUS OF UNCERTAIN CAUSE; and

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 given to a known alcoholic, should be accompanied by thiamine, 50 mg IV and 50 mg IM, which will prevent this neurologic 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 g) 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, can terminate some seizures.
	Also has a calming effect in anxiety or violent behavior.
INDICATIONS:	Status epilepticus
	Sedation (e.g. prior to cardioversion in conscious patients)
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 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 effects of dopamine predominate. At high doses, dopamine has α 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 (1:10,000 solution)

Ampules containing 1 mg in 1 ml (1:1,000 solution)

Multi-dose vial: 30 mg in 30 ml (1:1,000 solution)

ADMINISTRATION: In cardiac arrest, epinephrine is given intravenously in an escalating dose every 3 minutes

If an IV route cannot be established quickly, the drug may be instilled in the tracheo-bronchial tree via catheter through an endotracheal tube

For anaphylactic reactions, epinephrine is given via the intramuscular route

ADULT DOSAGE: In cardiac arrest situations:

Initial Dose: 1.0 mg (10 ml of 1:10,000 solution) IVP

Second Dose: 1.0 mg (10 ml of 1:10,000) or 3 mg (3 ml of 1:1,000) IVP

Third and subsequent dose: 5 mg (5 ml of 1:1,000) IVP

Endotracheal dose: 2 mg (1:1,000) diluted with 10 ml normal saline given via catheter during ventilation

In anaphylactic reactions:

Mild reactions: 0.3 mg intramuscular, (0.3 ml of a 1:1,000 solution)
(Do not, however, inject fingers or toes)

Another 0.3 ml is given SQ can be administered on another extremity

Severe reactions, with shock: 0.5 mg slow IV. (5 ml of a 1:10,000 solution)

For mild to moderate asthmatic attacks: 0.3 to 0.5 ml of a 1:1,000 solution, SQ

PEDIATRIC DOSAGE: Bradycardia: 0.01 mg/kg 1:10,000 every 3 minutes

Cardiac Arrest:

Initial Dose: 0.01 mg/kg 1: 10,000 IVP or IO push

Second & Subsequent Dose: 0.1 mg/kg 1:1000 IVP or IO push

Endotracheal: 0.1 mg/kg 1:1,000 diluted with 2 ml of NS

Newborn Cardiac Arrest:: 0.02 mg/kg 1:10,000 every 5 min. By IV, IO

Allergic Reaction/Asthma: 0.01 mg/kg 1:1,000 SQ Max 0.3 mg. No response and IV in place, 0.1 mg/kg 1:10,000 IVP

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 field, furosemide is given intravenously
ADULT DOSAGE:	40 mg SLOWLY IV (injected over 1-2 min) If a response is not obtained, a second dose of 60 to 80 mg 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, 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

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

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 ICP 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
	125 mg IV or IM
ADULT DOSE:	
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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
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 that 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 narcotic agents.

Reverses the actions of all narcotic drugs 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 NARCOTIC OVERDOSE or coma suspected to be due to narcotic overdose.

CONTRAINDICATIONS: None

SIDE EFFECTS:

Too 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 narcotics 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.

Has been reported to cause pulmonary edema and sudden death in rare cases.

HOW SUPPLIED: 2 mg in 2 ml prefilled syringe
0.4 mg in an auto-injector

NALOXONE (NARCAN®) (cont'd)

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 is preferable that the patient NOT wake up fully in the field, as these patients may be violent when brought abruptly out of coma. USE RESPIRATIONS AS A GUIDE.

If there is no response to two doses, suspect overdose with another, non-narcotic drug.

ADULT DOSAGE:

Initial dose: 2 mg Administer this solution VERY 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

If there is no response to the full dose of naloxone, it may be repeated in 5 minutes in the same fashion.

PEDIATRIC DOSAGE: 0.1 mg/kg

NOTE: The manufacturer of Evzio® recommends pinching the thigh prior to administration of naloxone via auto-injector at this injection site.

Newborn dose (narcotic dependent with decreased respiration):

0.1 mg/kg every 3 minutes until respiration is improved.

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 (under tongue).

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.

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: 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 ASTHMATIC ATTACK. ACUTE DECOMPENSATION OF COPD. STROKE, HEAD INJURY. REPEATED 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 hrs)
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:	Depends on the condition being treated. For cardiac arrest and other critical conditions, 100% oxygen should be given 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.

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.

PROVENTIL® / VENTOLIN® (ALBUTEROL)

THERAPEUTIC EFFECTS: Beta-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 beta stimulants
* Shortness of breath not from bronchoconstriction

SIDE EFFECTS:

* Nervousness
* Weakness
* Tremor
* Increased heart rate

HOW SUPPLIED: Unit dose 2.5 mg vials (3 ml)

ADMINISTRATION: By inhalation through a breathing aerosol device.

ADULT DOSAGE: 2.5 mg in NS via aerosol device with oxygen at 8 liters per minute.

PEDIATRIC DOSAGE: 2.5 mg (3 ml) in aerosol device with oxygen at 8 liters per minute

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) work more effectively.

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 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, in cardiac patients, if the potassium falls too low, the heart becomes irritable, and dysrhythmias may occur.

This is especially likely in patients taking diuretics.

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: Given by intravenous bolus injection

SODIUM BICARBONATE (cont'd)

ADULT DOSAGE: For cardiac arrest:

If used at all, 1 meq/kg after the first 10 minutes of CPR.

Acidosis should thereafter be prevented with adequate ventilation.

Do not give bicarbonate in the same syringe with epinephrine or calcium.

For other conditions: As ordered by physician.

PEDIATRIC DOSAGE: Cardiac Arrest:

1 meq/kg diluted with 1 ml/kg NS

Newborn: 0.5 meq/kg diluted with .5 ml/kg NS

SOTALOL (BETAPACE®)

THERAPEUTIC EFFECTS: Sotalol is a β-blocker that also inhibits potassium channels at the cellular level resulting in prolongation of PR and QT intervals.

INDICATIONS: Wide complex ventricular tachycardia.

CONTRAINDICATIONS: Asthma, congestive heart failure, COPD, second or third degree AV block

SIDE EFFECTS: Bradycardia, prolongation of QT intervals, dizziness, dyspnea

HOW SUPPLIED: Injectable solution 15 mg/ml

ADMINISTRATION: Intravenous

ADULT DOSAGE: 1.5 mg/kg (to a maximum of 100 mg) IV over 5 minutes.

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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. This 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