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# North Lake Tahoe Fire Protection District

EMS Protocols

Final Version May 20 2011

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### **FORWARD**

Optimal pre-hospital care results from a combination of careful patient assessment, essential pre-hospital emergency medical services, and appropriate medical consultation. The purpose of this manual is to provide guidance for all levels of NLTFPD personnel. The GOAL of the manual is to define written protocols of care which are consistent within NLTFPD.

It is to be understood that these protocols are guidelines. Nothing contained in these protocols shall be construed to expand the Scope of Practice of any Emergency Medical Technician beyond that which is identified in the State of Nevada Health Dept. Regulations and these Protocols.

To maintain the life of a specific patient, it may be necessary, in rare instances, for the physician providing On-Line medical consultation, as part of the EMS consultation system, to direct a pre-hospital provider in rendering care that is not explicitly listed within these protocols. To proceed with such an order both the On-Line physician and the provider must acknowledge and agree that the patient's condition and extraordinary care are not addressed elsewhere within these medical protocols, and that the order is in the best interest of patient care. Additionally, the provider must feel capable, based on the instructions given by the On-Line physician, of correctly performing the directed care. Whenever such care is provided, the EMS provider SHALL document on the PCR the specifics and have the On Line Physician who gave the order(s) sign said form.

Occasionally a situation may arise in which a physician's order cannot be carried out; e.g., the provider feels the administration of an ordered medication would endanger the patient, a medication is not available, or a physician's order is outside of protocol. If this occurs, the provider must immediately notify the On Line physician as to the reason the order cannot be carried out, and indicate on the PCR what was ordered, the time, and the reason the order could not be carried out.

**ICON AND TEXT STYLE REFERENCE MENU**



Item of Importance: Caution/Warning/Alert



Make On-Line Medical Contact

# OPERATIONS PROTOCOLS

## **COMMUNICATION FAILURE PROCEDURE**

### **PROCEDURE**

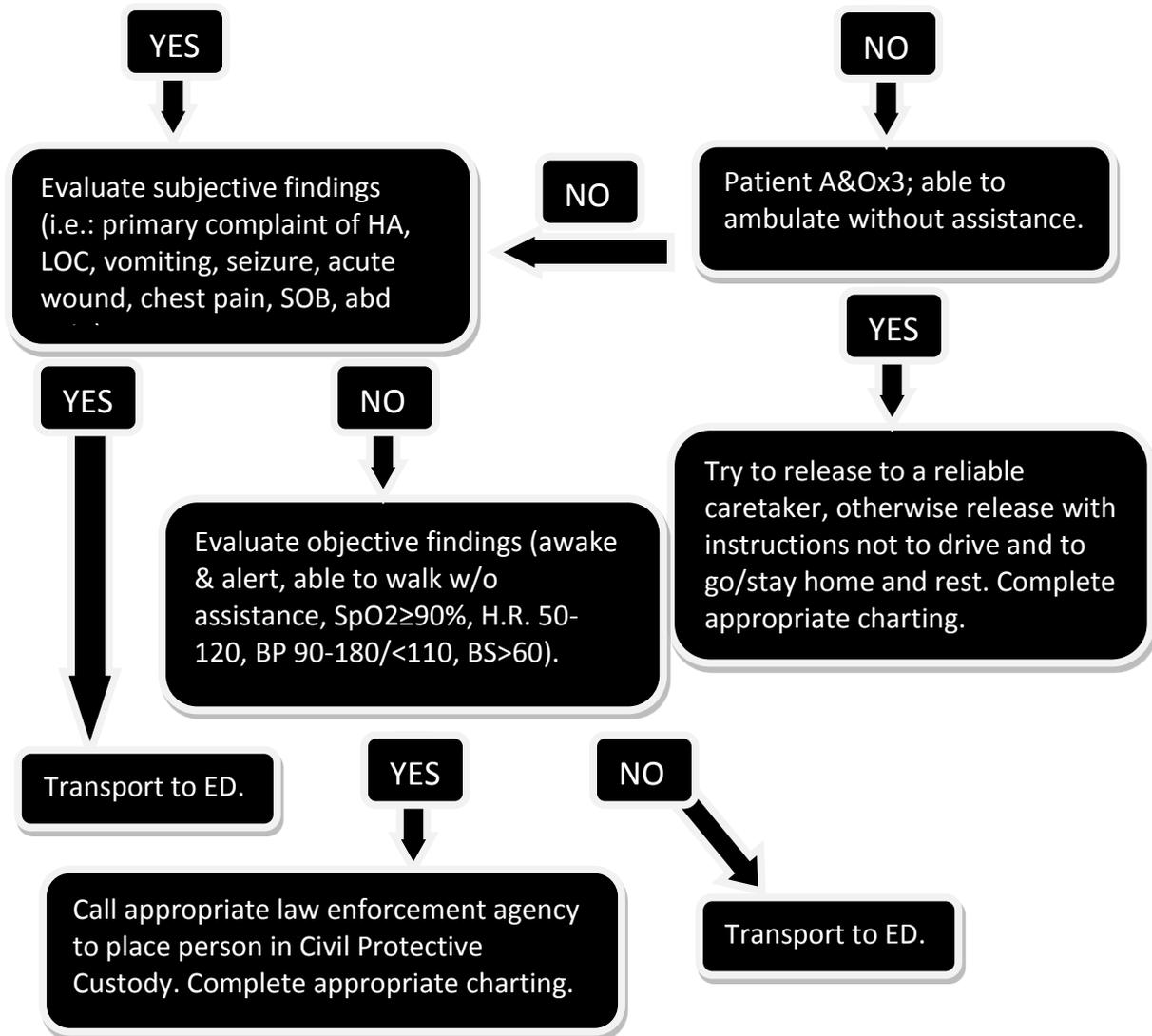
In the event an EMS provider cannot contact medical control (i.e. mass casualty or radio/telephone problem), all protocols become standing orders. Likewise, in the event that a medical control physician cannot respond to the radio/telephone within two minutes of the call, all protocols are considered standing orders. An emergency department nurse at the medical control hospital may relay orders from the emergency physician in cases where it is impractical for them to come to the radio/telephone. It is not necessary to speak with a medical control physician concerning treatment modalities that are considered to be standing orders except if a question arises concerning the planned treatment.

In the event medical control cannot be contacted, and treatment protocols were carried out as standing orders, the record should be pulled for review by the Medical Director. Following review, the record will be signed by the Medical Director indicating retroactive approval.

## CIVIL PROTECTIVE CUSTODY

### INTOXICATED PERSON REFUSING TREATMENT or TRANSPORT

Person at risk to harm self or others based upon intoxicated condition – such condition prevents them from safely caring for their own health or safety or the health or safety of others. (NRS 458.270 – Procedure for placing person in Civil Protective Custody)



## CONFIDENTIALITY

*In keeping with the legal requirements of the HIPPA regulations:*

- The patient's medical information should be kept confidential by the pre-hospital provider as private information in medical care. The patient likely has an expectation of privacy and trust that personal and medical information will not be disclosed by medical personnel to any person not directly involved in the patient's medical treatment.
- Any disclosure of medical information should not be made or allowed unless necessary for the treatment, evaluation or diagnosis of the patient or as may be required by law (i.e., suspected child or elder abuse).
- Any disclosure made by any person, medical personnel, the patient, or law enforcement should be treated as limited disclosures and not authorizing further disclosures to any other person.
- Any discussions of pre-hospital care by and between the receiving hospital, the crew members in attendance, or at in services or audits are done strictly for educational purposes. Further disclosures are not authorized.
- Radio communications should not include disclosure of patient names.
- The patient is not entitled to confidentiality of information that does not pertain to the medical treatment, medical condition, evaluation or diagnosis.
- The patient is not entitled to confidentiality for disclosures made publicly.
- The patient is not entitled to confidentiality with regard to evidence of a crime.

## RESUSCITATION

### **When NOT to start resuscitation** (assuming no possibility of hypothermia)

- Any patient, pulseless and apneic, displaying irreversible, obvious and accepted signs of death:
  - Decapitation, decomposition, dependent lividity, incineration, injuries incompatible with life, rigor mortis, visible brain matter
- On interfacility transfers including nursing home to hospital, when current, physician signed, DNR orders are present in the transport records and are clearly presented to the crew.
- Patient has a state-recognized Prehospital DNR Order (NRS 450B.400 to NRS 450B.590). It will state “Nevada State Prehospital DNR” either on the card or the piece of paper. If the patient’s Prehospital DNR is from a different state, that DNR will be honored.

### **When to START resuscitation**

- As soon as the absence of pulse and respiration is established

### **When to Contact Base Physician**

- Immediately upon arrival of blunt trauma arrest
  - Trauma victims require BLS resuscitation while contacting for termination of efforts
- Penetrating trauma arrest with transport time >10 minutes to a trauma facility
  - Trauma victims require BLS resuscitation while contacting for termination of efforts
  - Consider interventions for correctable causes of arrest
- Medical full arrest with asystole or PEA after initial ALS techniques unsuccessful
- Patients with suspected hypothermia will have appropriate ALS resuscitation initiated and prompt consultation with base station physician will be made. (See Hypothermia Protocol)

### RESUSCITATION (CONTINUED)

#### **When to CEASE Resuscitation**

- When base physician, after thorough report from paramedic, declares time of death.
- If resuscitation is initiated prior to arrival and patient shows obvious and accepted signs of death.
- If resuscitation is initiated prior to arrival and patient caregiver is presented a recognized prehospital DNR.

#### **When Death Has Been Established**

If obvious death with the possibility of criminal implications, try to leave patient in position found. Obvious death as described above does NOT require a cardiac monitor strip showing asystole. Complete PCR in a thorough and descriptive manner, as the report will contribute to the legal documentation of death. Secure the body and surrounding area until law enforcement takes custody of the scene. All other cases of pronounced death MUST have a cardiac monitor strip attached to the chart. On the chart place time of death, names and numbers of all personnel on scene, name of physician who pronounced death and the names of law enforcement personnel who take custody of patient if coroner not available.

### MINORS

Except for circumstances specifically prescribed by law, a minor is not legally competent to consent to (or refuse) medical care. A "minor" is any person under the age of 18. An "emancipated minor" is any person under the age of 18 who comes within the following description:

- Has entered into a valid marriage, whether or not such marriage was terminated by dissolution; or
- Is on active duty with any of the armed forces of the United States of America; or
- Has received a declaration of emancipation; or
- Requesting treatment for a possible pregnancy related problem (i.e., abdominal pain in a female past menarche); or
- A mother or has borne a child.

#### **Life-Threatening Situation**

Immediate treatment and /or transport to a medical facility should be initiated.

#### **Non-Life-Threatening Situation**

If a minor has any illness or injury, the paramedic should make a reasonable attempt to contact a parent or other legally qualified representative before initiating treatment or transport. If this is not possible, EMS personnel should transport the patient to the closest hospital with "implied consent". Parental consent is not needed for care in non- life-threatening situations when:

- Minor is emancipated
- Parent has given written authorization to procure medical care to any adult (18 or over) taking care of the minor
- Minor is an alleged victim of sexual assault
- Minor seeks prevention or treatment of pregnancy

MINORS (CONTNIUED)

**Minors who Refuse Care**

If a non-emancipated minor refuses any indicated treatment or transport, EMS field personnel should:

- Attempt to contact parents or other legally qualified representative for permission to treat and transport the minor.
- Contact appropriate law enforcement agency and request that the patient be taken into temporary custody in order that treatment or transport can be instituted.
- Contact base hospital and apprise them of the situation.

### PATIENT DESTINATION

#### PHILOSOPHY

The final destination hospital has profound clinical, personal, and financial implications for our patients. Personnel should consider the following criteria when deciding on hospital destination. When it's appropriate we will try to choose destination using "in-plan" hospitals for the patients insurance.

#### DEFINITIONS

**Base hospital(s)** — The base hospitals for the NLTFPD system are Renown Regional Medical Center, Renown South Meadows, St. Mary's Regional Medical Center, and Northern Nevada Medical Center.

#### PROCEDURE

***Patient / Family Choice*** — Patient or family members choice should dictate the hospital destination ***unless*** the patient meets Nevada State Trauma Criteria. In cases of airway obstruction, cardiac arrest, or critical /unstable patients, the destination will be the most appropriate hospital.

***Trauma*** — Patients who meet Nevada State Trauma Criteria shall be transported to the regional level II trauma center, Renown Regional Medical Center. If the patient (who is deemed competent) meets trauma criteria, but requests another hospital, the Paramedic should appropriately explain the rationale for treatment at the Trauma Center. If the patient still requests another destination, contact medical control at Renown Regional Medical Center, and the destination facility and obtain physician approval from both for diversion. If the patient refuses against the physicians order, document the risks and consequences you explained to the patient.

***Closest Appropriate Hospital*** — If a patient and or family has no preference of hospitals, and the patient doesn't meet any of the special conditions outlined, then transport shall be to the most appropriate hospital.

### PATIENT DESTINATION (CONTINUED)

#### ***Divert***

Occasionally facilities may declare divert status for select patients. Document on the PCR which nurse, or physician requested divert and the reason (Critical Care, Closed, ED Saturation etc). Diversion shall be to the closest most appropriate hospital that can treat the patient's condition. Divert status does not apply in cases of airway obstruction, trauma criteria, cardiac arrest or any patient that may be jeopardized by the diversion.

Four types of diversions may be declared:

- Closed – the hospital has no capacity/resources to accept any ambulance patient.
- Critical care – Assumes the hospital has no capacity/resources to accept ambulance patients who have a high probability of requiring an ICU admission. This would refer to ambulance patients who present in the field as high risk for potential or actual life-threatening health problems. Typically, this refers to patients who demonstrate signs and symptoms of: hemodynamic instability; acute respiratory failure; acute MI or severe CP; complete loss of consciousness or other presentations indicative of the need for critical care nursing or ICU admission. Paramedics are encouraged to contact the ED Charge RN or Physician-in-Charge directly to clarify questions about any potential transport.
- ED Capacity – Assumes the ED is over capacity with long treatment delays in triage that could potentially jeopardize the appropriate placement of incoming ambulance patients. Treat the same as a closed divert.
- Internal hospital disaster – the hospital has an in-house emergency such as a fire, electrical outage, hazmat or a major malfunction of critical equipment that may preclude the provision of safe effective care in the emergency department.

PATIENT DESTINATION (CONTINUED)

**Divert status (except for internal hospital disaster) does not apply in cases of airway obstruction, severe shock, cardiac arrest, uncontrolled hemorrhage, imminent delivery or any patient that may be jeopardized by the diversion.**

Divert status (except for internal hospital disaster) also does not apply to patients meeting pediatric and trauma criteria patients or in the case of an MCI. All hospital destinations during an MCI are coordinated under the MCI plan.

NLTFPD medical personal will consider current standards of care and hospital destination capabilities when deciding to transport to hospitals with a specialty center.

**AMI:** Any patient who meets the following criteria is taken to a hospital with interventional cardiology capabilities:

- 12 lead EKG shows S-T segment elevation of one or more millimeters in two or more contiguous leads. (ST Elevation Myocardial Infarction – STEMI MI)  
AND/OR
- History of angioplasty, stent placement, or coronary artery bypass graft AND symptoms suggesting acute coronary syndrome. These patients may require an interventional cardiologist.

The destination hospital should be alerted of incoming patients of evidence of AMI on a 12-lead ECG. “STEMI Alert” should be called to receiving hospital as soon as possible. NNMC has an interventional cardiac cath lab 24-7; however, unless the patient is adamant about destination or other hospitals are on divert status, transporting the patient there might delay definitive treatment when transporting from the Lake Tahoe basin.

### PATIENT DESTINATION (CONTINUED)

**CVA:** This applies to patients with stroke like symptoms who have an established onset of symptoms to be within the current three hour time to receive IV t-Pa. Current AHA requirements dictate that the ER has one hour to establish the patient as a candidate for IV t-Pa. These patients require a hospital with a CT scanner and are in communication with the “stroke team” at RRMC or St. Mary’s.

Patients who have an established onset of symptoms greater than three hours, but less than 9 hours can still receive interventional treatment (clot extraction or IA t-Pa) at either Renown Regional Medical Center, or Saint Mary’s Regional Medical Center.

**Pediatric Airway:** Patients 12 years of age or younger are to be taken to Renown Regional Medical Center if they present with a need for intubation, assisted ventilation, or critical care. This applies to pediatric patients who have an established pre-hospital advanced airway.

**Obstetric Emergencies:** This applies to high-risk pregnancies, pre-term labor, or labor that isn’t imminent. These patients require an obstetrician. Imminent deliveries are still transported to the closest appropriate hospital.

**Neonate:** Any patient 30 days of age or younger that presents with a need for intubation or bag-valve-mask ventilation will be taken to a hospital with a neonatal intensive care unit. Any patient born in the field will be taken to a hospital with a labor and delivery department.

**Trauma:** Per NRS all patients who meet Nevada State Trauma Criteria must be transported to the closest Level 1 or Level 2 trauma center. In most cases, this will be Renown Regional Medical Center.

**Sexual Assault:** Victims of sexual assault who do not meet trauma triage guidelines will be transported to the closest hospital or the hospital of their choice if a medical assessment is requested. Ensure that local law enforcement or you contact SART/CARES as soon as possible.

SART: (775) 742-2596 from 0600-1800 or (775) 742-5266 from 1800-0600  
CARES: (775) 328-3249 Mon-Fri 8am-5pm or after hours/weekends (775) 250-4208

PATIENT DESTINATION (CONTINUED)

**Patients in Custody:** Patients in custody of law enforcement should be transported to the hospital chosen by the officer, unless other clinical features are present. Patients being evaluated for suicidal ideations, or under a legal hold, should be transported to a hospital in Nevada. Incline Village Community Hospital does not have the resources to properly handle patients with suicidal ideations and should be transported to the next most appropriate facility in Northern Nevada.

HOSPITAL DESTINATION BASED ON CAPABILITIES

	RRMC	SMRMC	NNMC	RSM
AMI	X	X	X	
CVA	X	X	X	
Acute Pediatric	X			
OB Emergency	X	X		
Neonate	X	X		
Trauma Criteria	X			

	CTH	TFH	IVCH	BMH
AMI	X			
CVA				
Acute Pediatric				
OB Emergency	X	X		X
Neonate				
Trauma Criteria				

### INTERFACILITY TRANSFERS

Ambulance attendants should be aware that whenever a patient is to be transferred from one medical facility to another by EMS, the transferring physician is responsible for notifying, in advance, the receiving physician of the following:

- Reason for transfer
- Patient condition
- Estimated time of arrival

Ambulance attendants should expect that the transferring physician will provide to them the name of the receiving facility and receiving physician, a copy of any available diagnostic tests, X-rays and patient medical records prior to releasing the patient.

Ambulance attendants should only transfer a patient whose therapy required during the transfer lies within the ambulance attendant's capabilities, or that appropriate personnel (registered nurse, respiratory therapist, etc.) accompanies the patient.

Ambulance attendants are authorized to administer or monitor all medications listed on the approved medication list as appropriate for their level of licensure and as per protocol.

ILS and ALS ambulance attendants are authorized to administer or monitor any crystalloid IV solution during transport.

Arterial lines should be discontinued prior to transport unless appropriate personnel from the initiating facility accompany the patient.

Heparin locks/implantable catheters with/without reservoirs may be closed off and left in place. If they are to be used during transport, then an IV drip should be established.

Orogastric or nasogastric tubes may be left in place and should either be closed off or left to suction per order of transferring physician.

Orthopedic devices may be left in place at the ambulance attendant's discretion as to ability to properly transport the patient with existing device(s) in place.

### INTERFACILITY TRANSFERS (CONTINUED)

Trained personnel authorized to operate the apparatus should accompany any patient requiring mechanical ventilation during transport. If the patient will require manual ventilatory assistance, at least two persons shall be available to attend to the patient.

#### **Transport of Patient with IV Antibiotic**

- Obtain and document name of antibiotic
- Obtain and document dose and rate of administration
- If unfamiliar with antibiotic, ask about any specific side effects
- Monitor medication to ensure proper administration rate during transport
- Monitor patient for signs and symptoms of any side effects and/or allergic reactions such as nausea/vomiting, diarrhea, changes in LOC, rashes, swelling, SOB, or changes in BP. If any changes noticed; discontinue IV, initiate appropriate treatment, document changes, and inform staff at receiving facility.

## REFUSAL OF CARE



**A Patient is anyone who has a complaint, an obvious injury or disability, is altered, or has requested medical aid.**

Patient refusal is one of the foremost causes of liability for any EMS system. All actions you take pursuant the patient's assessment and care must be documented. All patients should be assumed to have an illness or injury that requires further assessment and/or treatment at an acute care facility.

If any patient refuses treatment and or transport, they need to be told the risks and consequences of not being transported to the hospital and these risks and consequences must be documented, and that the patient understood.

If the patient still refuses, despite your best efforts to convince them to be transported, they need to sign the AMA (Against Medical Advice) form and be told to call 911 if they change their mind. At any time contact the base physician if there are any questions whether a patient is competent and capable of signing AMA.

Additionally, it is required that you assess the patient's competency to make an informed, rational decision on his medical needs. If the patient is not capable of making this determination for any reason including age, intoxication, mental competency, or as a result of the patient's medical condition, any actions you take to protect the patient must be documented.

The patient must be informed of the potential results of not going to the hospital or of refusing your care. An assessment with vital signs must be done. The patient will then sign the refusal form. If the patient refuses to sign, attempt to have a family member or competent witness to the event sign the witness portion of the form. Make certain that the patient understands that if his condition worsens or if he changes his mind, he can call and request our services once again. Document the person or agency the patient was released to. Any crew member may complete a Refusal of Care chart, provided that the patient's complaint is within that provider's scope of practice. However, the provider with the highest licensure /certification is ultimately responsible and will assure that appropriate care and documentation are completed.

### REFUSAL OF CARE (CONTINUED)

#### Notes

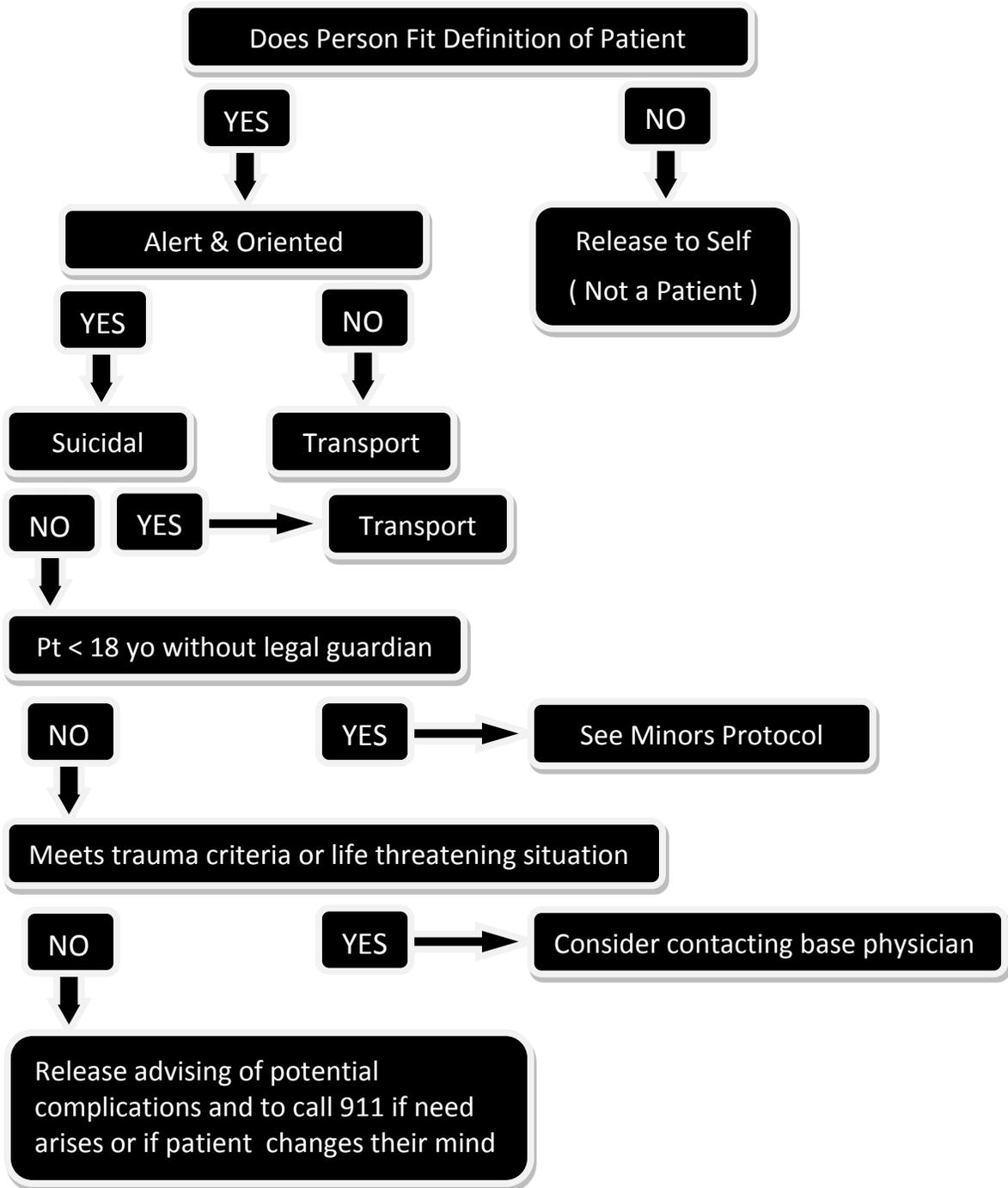
- See Minors procedure if patient under 18 years of age.
- Any person not alert and oriented cannot sign AMA.
- If patient has been consuming alcohol, see CPC Decision Tree.
- Trauma criteria does not rule out a patient's right to sign AMA.
- If patient meets trauma criteria by mechanism and is refusing care, it is the provider's discretion whether base contact needs to be made.
- If patient meets trauma criteria by injury and is refusing care, contact with base physician must be made.
- Suicidal patients cannot sign AMA. It is the provider's discretion whether to transport or release a patient to police for transport.

#### The following items must be documented on the PCR:

- Risks of not seeking treatment
- Patient understands risks of refusing
- Advised to call 911 at any time if any changes
- Any instructions given to patient, family, or guardian
- Patient was left in care of whom?
- Patient capable and competent to sign AMA
  - (physiologically stable and able to understand and reiterate to you the problem, risks, and consequences of refusal)
- Able to ambulate or reason why unable

REFUSAL OF CARE (CONTINUED)

AMA DECISION TREE



**TRAUMA CRITERIA AND TRANSPORT REQUIREMENTS**

<p><b>Mechanism</b></p> <ul style="list-style-type: none"> <li>▪ Fall &gt; 20 feet</li> <li>▪ MVC with speed &gt; 40 mph</li> <li>▪ MVC resulting in 20 inches of severe damage to vehicle</li> <li>▪ Vehicle rollover &gt; 90 degrees rotation</li> <li>▪ MVC with death in the same vehicle</li> <li>▪ MV vs. pedestrian with speed &gt; 6 mph; or runover or thrown at any speed</li> <li>▪ Vehicle intrusion – patient side ≥ 12 inches</li> <li>▪ Motorcycle &gt;20mph or thrown</li> <li>▪ MVC extrication time&gt;20 min</li> <li>▪ Ejection</li> </ul>	<p><b>Injury</b></p> <ul style="list-style-type: none"> <li>▪ Flail chest</li> <li>▪ Acute paralysis</li> <li>▪ Two or more proximal long bone fractures</li> <li>▪ Combination of burns &gt;15% of body or burns to face or airway</li> <li>▪ Penetrating chest, abdomen, head, neck or groin injury</li> <li>▪ Amputation proximal to wrist or ankle</li> </ul>
	<p><b>Physiologic</b></p> <ul style="list-style-type: none"> <li>▪ Systolic BP&lt;90</li> <li>▪ Respiratory rate &lt;10 or &gt;29</li> <li>▪ Revised Trauma Score &lt; 11</li> <li>▪ Glasgow Coma Scale ≤ 13</li> </ul>

· If the patient is under the age of five, over the age of 55, or known to have any of the following medical conditions consider contacting medical control at the trauma center for direction:

- Cardiac or respiratory disease
- Insulin dependent diabetes
- Cirrhosis
- Morbid obesity
- Pregnant
- Suppressed immune system
- Bleeding disorder
- Taking anticoagulants

### TRAUMA CRITERIA AND TRANSPORT REQUIREMENTS (CONTINUED)

When a patient at the scene of trauma meets any of the above criteria, they will be transported to the nearest Level 1 or Level 2 trauma center. If the patient has been evaluated by a physician at a clinic or hospital prior to EMS arrival, that patient will be transported to the hospital determined by that physician.

**IF THERE IS ANY QUESTION AS TO DESTINATION, CONTACT THE BASE PHYSICIAN AT THE CLOSEST TRAUMA CENTER.**

### TRANSPORT REQUIREMENTS

450B.774 Procedure when patient refuses transportation to center for treatment of trauma.

If a patient at the scene of an injury refuses to be transported to a center for the treatment of trauma after a determination has been made that the patient's physical condition meets the triage criteria requiring transport to the center, the person providing emergency medical care shall evaluate the mental condition of the patient. If he determines that the patient is competent, the patient must be advised of the risks and consequences of not receiving further treatment at the center.

If the patient continues to refuse to be transported to the center for treatment of trauma, the person providing emergency medical care shall inform a physician at the center for treatment of trauma of the patient's refusal to be transported to the center for treatment before he leaves the scene of the injury.

If patient agrees to transport but requests a facility other than Renown Regional Medical Center, patient (not family or friend), must be deemed competent to make such a decision. Base contact to Renown Regional Medical Center and receiving facility must be made for physician approval of diversion. If patient is deemed incompetent by the paramedic's best judgment, patient will be transported to Renown Regional Medical Center for evaluation and/or treatment.

TRAUMA CRITERIA AND TRANSPORT REQUIREMENTS (CONTINUED)

**Revised Trauma Score**

<b>Glasgow Coma Scale (GCS)</b>	<b>Systolic Blood Pressure (SBP)</b>	<b>Respiratory Rate (RR)</b>	<b>Coded Value</b>
13-15	>89	10-29	<b>4</b>
9-12	76-89	>29	<b>3</b>
6-8	50-75	6-9	<b>2</b>
4-5	1-49	1-5	<b>1</b>
3	0	0	<b>0</b>

## **UNSOLICITED MEDICAL INTERVENTION**

### **PROCEDURE**

Once a physician has identified him/herself as such on scene, thank them for their offer of assistance. Then advise him/her that you are operating under the authority of the State of Nevada and under protocols approved by the State of Nevada. You are also delivering care under the authority of a Medical Director and standing medical orders.

To avoid confusion and expedite patient care, no individual should intervene in the care of the patient unless the individual is:

- Requested by the attending Paramedic / EMT-II
- Is authorized by the Medical Control physician (base station physician).
- Is capable of delivering more extensive emergency medical care at the scene.

If he /she assumes patient management, he /she accepts responsibility for the patient's care. This requires him/her to accompany the patient to the emergency department.

If he /she assumes this responsibility, he /she must document this and sign the patient's chart accordingly.

# ADULT TREATMENT PROTOCOLS

**ABDOMINAL / BACK / FLANK PAIN (NON-TRAUMATIC)**

- Assess oxygenation and administer oxygen as needed
- Spinal motion restriction when appropriate.
- Place patient in position of comfort.
- Patient should be NPO
- Obtain vascular access.
- Consider placing patient on cardiac monitor.
- If signs and symptoms indicate hypoperfusion, consider Shock Protocol.
- For pain management use Pain / Sedation Protocol.
- If patient complains of nausea, consider Nausea / Vomiting Protocol.
- Consider nasogastric tube.

## **ADRENAL INSUFFICIENCY (CONGENITAL ADRENAL HYPERPLASIA)**

Patients requiring emergency treatment will have any of the following symptoms:  
Respiratory distress, Shock, Altered level of consciousness

Patients must have clinical diagnosis of CAH to be eligible for treatment under this protocol

- Assess oxygenation and administer oxygen as needed
- Place patient on cardiac monitor
- Manage airway as indicated by patient condition
- Obtain Vascular Access
- If patient assessment indicates hypoperfusion, consider Shock Protocol
- Assess for signs of fluid overload
- Treat respiratory illness with appropriate protocol
- Determine blood glucose level

### Treatment



- Administer hydrocortisone sodium succinate
  - 100 mg IV/IO/IM for adolescents and adults
- Repeat glucose check 30 minutes after treatment and document

## **AIRWAY OBSTRUCTION**

- Choking / Conscious
  - Ask patient to speak to establish level of obstruction.
  - If unable to speak, apply abdominal thrusts until FBO is relieved or patient becomes unconscious.
  - If relieved, continue general patient assessment and care
  
- Choking / Unconscious
  - If patient is unconscious or becomes unconscious while trying to relieve obstruction, position head, finger sweep, and try to ventilate.
  - If unsuccessful, place patient supine and perform 5 abdominal thrusts.
  - Apply finger sweep, remove dentures if present.
  - Try to visualize obstruction with laryngoscope and remove it with McGill forceps, taking care not to cause further obstruction.
  - If relieved, continue general patient Assessment and Care
  - Suction as needed.
  
- If Unsuccessful, a Surgical Cricothyroidotomy may be necessary.

## **ALTERED LEVEL OF CONSCIOUSNESS**

GLASCOW COMA SCALE < 15

- Assess oxygenation and administer oxygen as needed
- Place patient on cardiac monitor.
- Manage airway as indicated by patient condition.
- Prior to KING Airway or intubation, ensure that patient's condition can't be improved with D50 or naloxone .
- Obtain Vascular Access.
- If patient assessment indicates hypoperfusion, consider Shock Protocol.
- Determine blood glucose level. If patient's blood glucose is <60 mg/dl:
  - ⌘ If patient is alert, and able to protect their own airway, administer Oral Glucose Gel.
  - ⌘ Give dextrose 50% (D50) 25gm. Repeat if blood glucose level is still under 60 mg/dl.
- If Unable to obtain an IV, administer GLUCAGON 1mg. Do Not Use in patients with previous glaucoma diagnosis.
- If patient is hypoglycemic and malnourished or has ETOH abuse history: administer THIAMINE 100mg prior to D50.
- If clinically indicated (pin point pupils, respiratory depression) Give:
  - ⌘ Naloxone 2mg and repeat as necessary.
- Treat any associated injuries as needed.
- Continue GENERAL PATIENT ASSESSMENT AND CARE.

## ALLERGY / ANAPHYLAXIS

- Assess oxygenation and administer oxygen as needed
- Manage airway as needed
- Obtain vascular access.
- If patient's signs and symptoms indicate hypoperfusion, administer an IV fluid bolus Shock Protocol.
- Place patient on cardiac monitor.
- Assess degree of allergic reaction:
  - ✘ MILD: generalized hives, swelling, itching.
  - ✘ MODERATE: mild symptoms with wheezing and difficulty swallowing.
  - ✘ SEVERE: impending respiratory failure and hypotension.
- For MILD reaction administer Diphenhydramine 25 - 50 mg.
- For MODERATE reaction, administer:
  - ✘ Diphenhydramine 25 - 50 mg
  - ✘ Albuterol unit dose 2.5mg in 3.0ml by nebulizer
  - ✘ Consider epinephrine 0.3mg 1:1000 IM \*\*
- For SEVERE reaction, administer:
  - ✘ epinephrine 0.3mg of 1:1000 IM \*\*
  - ✘ Diphenhydramine 25 - 50 mg
  - ✘ Consider epinephrine 0.1mg in 100 cc normal saline run wide open. May repeat to max of 0.3 mg
  - ✘ If patient is intubated and no IV access, consider IO access, or administer epinephrine 0.5mg\*\* via endotracheal tube.



\*\*If patient's age is > 45, or has previous cardiac history, or Hypertension

## BENZODIAZEPINE REVERSAL

- This protocol is for use only with patients that have received benzodiazepines from NLTFPD personnel or with known benzodiazepine overdoses.
  - ⌘ This protocol cannot be used for known benzodiazepine overdoses on patients who are chronic benzodiazepine users.
  - ⌘ It may not be used for patients with an unknown cause altered level of consciousness.
- Assess oxygenation and administer oxygen as needed
- Manage airway as needed
- Place patient on cardiac monitor
- Look for medication bottles to confirm benzodiazepine overdose.
- Obtain vascular access.
- For reversal of benzodiazepines given by NLTFPD personnel.
  - ⌘ Administer 0.2mg flumazenil over 30 seconds. If patient does not reach desired level of consciousness after 30 seconds, 0.3 mg is administered over 30 seconds.
-  For other known Benzodiazepine overdoses.
  - ⌘ Administer flumazenil 0.2mg over 30 seconds. If patient does not reach desired level of consciousness after 30 seconds, 0.3 mg is administered over 30 seconds.

### BURNS

#### THERMAL BURNS

- Remove clothing which is smoldering and non-adherent to the patient.
- Assess oxygenation and administer Oxygen as needed
- Assess and treat associated trauma
- Remove rings, bracelets and other constricting objects
- If < 10% body surface area burned, use moist saline dressing for patient comfort.
- If burn is moderate to severe (> 10% BSA), cover with clean, dry dressings.
- Obtain vascular access.
- Administer IV fluids as follows:
  - ⌘ If transport time is greater than 15 minutes, calculate fluid administration using:
    - $4\text{cc LR or NS} \times \text{weight in kg} \times \% \text{BSA} = \text{total fluid}$ , Then:
    - Administer 50% of total fluids in first 8 hours from time of injury
    - Administer 50% of total fluids over next 16 hours.
  - ⌘ If transport time is less than 15 minutes, run IV at wide open rate.
- Consider Pain/Sedation Management protocol
- Evaluate for inhalation injury and prepare to intubate.

#### CHEMICAL BURNS/HAZMAT CONTAMINATION

- Protect rescuer from contamination
- Remove all clothing and solid chemical which might provide continuing contamination.
- Decontaminate patient using running water for 15 minutes if patient is stable
- Assess and treat associated injuries and evaluate for systemic symptoms
- Consider Pain/Sedation Management protocol
- Wrap burned area in clean dry cloth
- Keep patient warm after decontamination
- Contact hospital as soon as possible with type of chemical contamination for consideration of additional decontamination prior to entry into ED.

BURNS (CONTINUED)

ELECTRICAL BURN/LIGHTNING

- Protect rescuers from continued live electric wires
- Separate victim from electrical source when safe for rescuers
- Initiate CPR as needed, treat dysrhythmia per protocol
- Obtain Vascular Access.
- Administer IV Fluids as Follows:
  - ⌘ If Transport Time is Greater than 15 Minutes, Calculate Fluid Administration Using:
    - $4\text{cc LR or NS} \times \text{Weight in kg} \times \% \text{BSA} = \text{Total Fluid}$ , Then:
    - Administer 50% of Total Fluids in First 8 Hours From Time of Injury
    - Administer 50% of Total Fluids Over Next 16 Hours.
  - ⌘ If Transport Time is Less than 15 Minutes, Run IV at wide Open Rate.
- Prolonged respiratory support may be needed
- Assess for other injuries
- Consider Pain/Sedation Management protocol

## CARDIAC ACUTE CORONARY SYNDROME

- Assess oxygenation and administer oxygen.
- Place patient on cardiac monitor
- Obtain and interpret 12-lead ECG
- Treat any underlying dysrhythmias according to the appropriate protocol.
- Obtain vascular access.
- Administer aspirin (ASA) 162mg if patient hasn't taken it in the last 4 hours
- Administer nitroglycerin 1 spray or a 0.4mg tablet sublingual.
  - ⌘ May be repeated q 5 minutes if SBP remains >90 mm/Hg
  - ⌘  Nitroglycerin is contraindicated for patients who have taken any erectile dysfunction medications in the last 24-36 hours (e.g. sildenafil, vardenafil, tadalafil).
  - ⌘  Nitroglycerin should be used with caution in any patient with presumptive evidence of right ventricular infarction and patient should be managed with IV fluid bolus.
- If Systolic BP is < 90 mm/Hg:
  - ⌘ Lay patient down if tolerated.
  - ⌘ In the absence of pulmonary edema, administer a 500 cc fluid bolus and reassess for fluid overload. Repeat as needed.
  - ⌘ Withhold nitroglycerin and consider administration of morphine sulfate.
- Consider administration of 2-5mg morphine sulfate. May repeat q 5-15 minutes PRN.
- If time to hospital is >15 min, apply 1 inch of nitroglycerin paste
- Complete a fibrinolytic eligibility checklist
- Call "STEMI Alert" when appropriate to receiving hospital as soon as possible

## CARDIAC ASYSTOLE

- Confirm pulseless arrest
- Begin CPR
  - ✕ Recheck pulse q 2 min
- Place patient on cardiac monitor
- Manage airway as indicated by patient condition
- Obtain vascular access
- Administer epinephrine 1mg every 3-5 min
  - Endotracheal dose 2.5mg ET, repeat q 3-5 min
- Consider administration of atropine 1mg every 3-5 minutes to max dose 3 mg
  - Endotracheal dose 2mg ET, repeat q 3-5 min
- If the patient remains in asystole after 3 rounds of medications:
  -  Consult Medical Control for:
    - Possible administration of sodium bicarbonate
    - Termination of efforts
      - Prior to termination efforts, a minimum of 3 rounds of medications must be given.
- If ROSC go to CARDIAC HYPOTHERMIA POST ROSC protocol

## CARDIAC BRADYCARDIA

- Assess oxygenation and administer oxygen
- Place patient on cardiac monitor
- Obtain Vascular Access
- Consider applying MFE pads
- Determine if patient is symptomatic (chest pain, SBP<80, pulmonary edema, SOB, ALOC)
  - If No, observe and transport.
  - If Yes, determine if bradycardia is 2<sup>nd</sup> Degree Type II or 3<sup>rd</sup> Degree Heart Block.
    - If Yes, begin transcutaneous pacing, consider Pain Sedation protocol.
    - If No, consider atropine 0.5mg, Repeat 0.5 mg if needed every 3-5 minutes (max dose of 3 mg).
      - If ineffective, begin transcutaneous pacing and consider Pain Sedation protocol.
- Consider dopamine drip if pacing is ineffective
-  Consider epinephrine drip at 2-10 mcg/min if pacing and dopamine ineffective.

## CARDIAC HYPOTHERMIA POST ROSC

- Patients must meet all the following criteria to be eligible for this protocol:
  - Have Sustained Return of Circulation post non-traumatic cardiac arrest
  - Are > 18 years of age
  - Temperature > 93°F (34 C)
  - No purposeful response to voice or pain
  - Blood Glucose > 60 mg/dl
  - Sustained Capnography monitoring in place
- The following patients are not eligible for this protocol
  - Pregnant patients
  - Traumatic or Hemorrhagic Cardiac Arrest patients

### Treatment

- Ensure continuous monitoring of SpO<sub>2</sub>, ETCO<sub>2</sub> waveform, and ECG
- Monitor core temperature
- Maintain ETCO<sub>2</sub> < 40 mm Hg
- Expose patient and place cold packs in axilla and groin
- Rapidly infuse cold (33°F) NaCl at 30 ml/kg. Max 2000 ml
  - Use Thomas Chillcore Cooling Case
- Assess neuro status
- If patient begins to shiver administer Versed 2.5 mg, repeat to max of 10 mg.
- Ensure vitals are within normal limits and follow respective protocol if needed
- Continue to search for and treat differential causes of arrest
- Transport patient to facility with established Induced Hypothermia protocols and equipment and notify facility as soon as possible

## CARDIAC PULSELESS ELECTRICAL ACTIVITY

- Confirm pulseless arrest
- Begin CPR
  - Recheck pulse q 2 min
- Place patient on cardiac monitor
- Search for and treat cause of arrest
- Manage airway as indicated by patient condition
- Obtain vascular access
- Administer epinephrine 1mg every 3-5 min
  - Endotracheal dose 2.5mg ET, repeat q 3-5 min
- If rate <60 bpm consider administration of atropine 1mg every 3-5 minutes to max dose 3 mg
  - Endotracheal dose 2mg ET, repeat q 3-5 min
-  Consult Medical Control for:
  - Termination of efforts
    - Prior to termination efforts, a minimum of 3 rounds of medications must be given.
- If ROSC go to CARDIAC HYPOTHERMIA POST ROSC protocol

## CARDIAC SUPRAVENTRICULAR TACHYCARDIA >150 BPM

QRS Complex < 120 ms

- Assess oxygenation and administer oxygen
- Place patient on cardiac monitor
- Manage Airway as indicated by patient condition
- Obtain vascular access.
- For SVT
  - Attempt vagal maneuvers.
  - If patient is hemodynamically unstable, (Pos. SOB, Chest Pain, Altered, SBP < 80)
    - Administer adenosine
    - 6 mg rapidly
    - Repeat in 1-2 minutes if needed at 12 mg rapidly. May repeat once at 12 mg
  - If unsuccessful or IV is not established, perform synchronized cardioversion:
    - Biphasic 75j – 120j – 150j – 200j
- For atrial fibrillation or flutter:
  - ⌘ If patient is hemodynamically unstable, (Pos. SOB, Chest Pain, Altered, SBP < 80)
    - Perform synchronized cardioversion:
      - Biphasic 75j – 120j – 150j – 200j
- If patient is conscious, consider Pain / Sedation protocol.
- If patient is unconscious, consider cardioversion first.
-  If onset of atrial fibrillation cannot be determined, or is greater than 48 hours call for medical direction



Remember to run a continuous ECG strip during procedures.

## **CARDIAC VENTRICULAR ECTOPY**

Ectopic QRS Complex > 120 ms

- Assess oxygenation and administer oxygen
- Place patient on cardiac monitor
- Manage airway as indicated by patient condition
- Obtain vascular access.
- Patient presents with 3 or more PVCs together.
  - If Yes, Use Wide Complex Tachycardia with Pulses Protocol.
- Patient presents with R on T PVCs
  - Administer lidocaine 1.5mg/kg or 150 mg amiodarone over 10 min.
    - After lidocaine bolus, start a lidocaine drip at 2-4mg/minute.

## CARDIAC V-FIB OR PULSELESS V-TACH

- Confirm pulseless arrest
- Begin CPR
  - ⌘ Recheck pulse every 2 min no longer than 10 seconds
  - ⌘ Minimize interruptions in CPR during resuscitation
  - ⌘ If unwitnessed arrest 2 minutes of CPR prior to any defibrillation.
  - ⌘ If witnessed defibrillate immediately
- Place patient on cardiac monitor
- Manage airway as indicated by patient condition
  - ⌘ Obtain vascular access.
- If rhythm is ventricular fibrillation or pulseless ventricular tachycardia:
  - ⌘ Defibrillate every 2 minutes
    - 1<sup>st</sup> shock 120J and successive shocks at 200J
    - Resume CPR immediately after each defibrillation
  - ⌘ Administer epinephrine 1mg every 4 minutes during CPR
    - Endotracheal dose 2.5mg ET, repeat q 3-5 min
  - ⌘ Administer an Antiarrhythmic every 4 min
    - Amiodarone 300mg, consider additional 150 mg
    - Lidocaine 1-1.5 mg/kg followed by 0.5-0.75 mg/kg every 5 min to a 3 mg/kg maximum
      - Follow Lidocaine conversion with 2-4 mg/min drip.
    - If No IV / IO access, administer lidocaine via ET 3mg/kg.

### CARDIAC V-FIB OR PULSELESS V-TACH (CONTINUED)

- If rhythm is pulseless torsades de pointes:
  - ⌘ Defibrillate every 2 minutes
    - 1<sup>st</sup> shock 120J and successive shocks at 200J
    - Resume CPR immediately after each defibrillation
  - ⌘ Administer epinephrine 1mg every 4 minutes during CPR
    - Endotracheal dose 2.5mg ET, repeat q 3-5 min
  - ⌘ Administer magnesium sulfate 2 g over 5 minutes



Contact medical control for further orders.

- A sudden, large increase in ETCO<sub>2</sub> is usually an indication of return of spontaneous circulation.
- If a patient converts to a perfusing rhythm after the administration of amiodarone bolus, you may consider amiodarone drip 150 mg over 10 min, as needed per patient condition.
- If ROSC go to CARDIAC HYPOTHERMIA POST ROSC protocol

## **CARDIAC WIDE COMPLEX TACHYCARDIA WITH PULSE**

>150 BPM, QRS Complex > 120 ms

- Assess oxygenation and administer oxygen
- Manage airway as indicated by patient condition
- Place patient on cardiac monitor
- Obtain vascular access
- For aberrantly conducted supraventricular rhythms:
  - Adenosine 6mg, if needed follow with 12 mg
- For monomorphic ventricular tachycardia:
  - If patient is hemodynamically stable
    - administer amiodarone 150 mg in 100 ml NS over 10 minutes. Repeat as needed to a maximum dose of 2.2g/24 hours.
  - If patient is hemodynamically unstable, perform synchronized cardioversion:
    - Biphasic 75j – 120j – 150j – 200j
    - If patient is successfully cardioverted, administer amiodarone 150 mg in 100 ml NS over 10 minutes.
- For torsades de pointes:
  - If patient is hemodynamically stable
    - Administer magnesium sulfate 2 g over 5-60 minutes
  - If patient is hemodynamically unstable, perform synchronized cardioversion:
    - Biphasic 75j – 120j – 150j – 200j
- If patient is conscious, consider pain / sedation protocol prior to cardioversion.



Contact medical control for further orders if rhythm persists.

### CHILDBIRTH

- Assess oxygenation and administer as needed
- Obtain vascular access
- If patient presents with vaginal bleeding, determine pregnancy status and obtain pertinent history:
  - Due date and or last menstrual period
  - Number of fetuses if known
  - Prenatal care and known problems
- If patient presents as miscarriage:
  - Collect any passed tissue if possible and transport with patient.
  - If hypotensive, treat according to shock protocol.
- If patient presents as pregnant with contractions and or pain and perineal exam shows bleeding, leaking fluid, crowning and rock-hard abdomen, prepare for imminent delivery.

#### **Normal Head First Presentation**

- Puncture amniotic sac if not already broken
- Deliver and support the head.
- If umbilical cord is wrapped around the neck, unwrap and slip it over the head.
- Deliver remainder of baby
- Protect from temperature loss; wipe off fluids and wrap in warm, dry blanket
- Clamp the umbilical cord in two places 8"-10" from baby and cut between clamps
- Do apgar scoring at 1 and 5 minutes
- Transport and allow placenta to deliver naturally. Do not delay transport for delivery of placenta.
- Once placenta delivers, perform fundal massage to control bleeding

## CHILDBIRTH (CONTINUED)

### **Breech Presentation**

- Deliver baby to waist while supporting body
- Assist in the delivery of the chest and head
- If head doesn't deliver in 4-6 minutes, place mother in the knee chest position to facilitate opening the pelvic cavity. Insert gloved hand into vagina to create airway for the infant.

### **Abnormal Limb Presentation**

- Place mother in lateral recumbent position
- Transport and notify receiving hospital of situation and eta

### **Prolapsed Cord Presentation**

- Place mother on back with hips elevated or in knee to chest position.
- Wrap cord in saline moistened dressing
- Place gloved index and middle finger into the vagina and push the infant up to relieve pressure on the cord.
- Check and document cord pulse.
- Transport and notify receiving hospital of situation and eta. Do not remove hand until adequate assistance is available.

### **Post-Partum Vaginal Bleeding**

- Massage the fundus of the uterus to facilitate delivery of the placenta, or once the placenta has delivered, to slow bleeding.
- If patient continues to bleed heavily, give fluid challenge and begin oxytocin infusion by placing 20units (2 amps) into 1 liter of normal saline and administering 500cc fluid bolus over 10-20 minutes. Adjust the infusion rate to 125 ml/hr.

## COMBATIVE PATIENTS

- Consider other causes of the patient's behavior:
  - Hypoxia, substance use, hypoglycemia, head trauma, anxiety, correct if possible.
- Consider physically or chemically restraining patients when:
  - The patient is a threat to themselves, bystanders, or EMS personnel
  - An incarcerated person may be restrained at the discretion of law enforcement
  - Assess the need to restrain all intubated patients to prevent accidental extubation.

### Physical Restraint

- Patients should be restrained with a soft restraint on all extremities. Restraining opposing muscle groups (swimmers position) is most effective.
- Assess distal circulation, sensation, and motor function after restraint.
- Maintain appropriate oxygen saturation.
- Reassess and perform vitals as indicated.
- Obtain vascular access as needed.
- Place patient on cardiac monitor as needed.

### Chemical Restraint

- If patient continues to present a danger to themselves or others, consider the use of chemical restraints using the pain/sedation protocol. Document reasons in PCR.

## CVA / STROKE

- Protect the airway, spinal immobilization as needed
- Assess oxygenation and administer low flow O2 as needed
- Place cardiac monitor and obtain 12-Lead ECG
- Check blood glucose and treat as indicated
- Perform fibrinolytic screening
- Consider using hypertension protocol as indicated by patient's condition.
- Obtain vascular access.
  - If patient meets criteria for fibrinolytic therapy, start an additional IV lock.
- Elevate head of bed at least 35-45 degrees
- An aphasic patient can still be completely alert. Explain procedures and communicate with the patient.
- Initiate rapid transport performing as much patient care as possible en-route
- Patients with established symptom onset less than 9 hours may still qualify for interventional treatment at a comprehensive stroke care center
- the Cincinnati Stroke Scale is used to determine presence of CVA symptoms
  - Facial droop
    - Assess face for asymmetry
  - Arm drift
    - Hold both arms out palm down at shoulder level. Have patient close eyes and observe for drift or inability to raise arms
  - Speech deficits
    - Look for slurring or inappropriate words. Assess for expressive or receptive aphasia
- Obtain pertinent history to include:
  - Last known time that patient was awake and symptom free.
  - Recent history of falls or trauma
  - Seizure activity

## GENERAL PATIENT ASSESSMENT AND CARE

Purpose: To give a standard of care for NLTFPD on all EMS calls.

- Review the Dispatch information while en route
- Consider proper PPE
- Evaluate scene safety
- Determine number of patients
- Consider the need for additional resources

### Patient Approach

- Determine the mechanism of injury or nature of illness
- If appropriate, begin triage and initiate mass casualty incident (MCI)

### Initial Assessment

- Airway
  - ⌘ Open and establish airway
    - Head tilt – chin lift (if no suspicion of c-spine injury)
    - Jaw thrust (if c-spine injury suspected)
  - ⌘ Suction as necessary
  - ⌘ If necessary, insert airway adjunct
    - Oral airway if gag reflex is absent
    - Nasal airway if gag reflex is present
  - ⌘ If airway blocked by FBO, attempt to relieve with airway obstruction techniques.

### GENERAL PATIENT ASSESSMENT AND CARE (CONTINUED)

- Breathing
  - ✘ Determine if breathing is adequate
    - If patient's ventilations are not adequate, provide assistance with 100% o<sub>2</sub> using bag-valve-mask (BVM) or CAREvent ventilator
  - ✘ Administer O<sub>2</sub> as Appropriate.
    - 2-6 LPM via cannula
    - 6-15 LPM via simple face mask
    - 12-15 LPM via NRB
  - ✘ Use pulse oximetry and clinical signs to assess interventions
  
- Circulation
  - ✘ Assess brachial, radial, or carotid pulse.
  - ✘ Assess for and manage bleeding
  - ✘ Assess skin color, temperature, and capillary refill
  
- Disability
  - ✘ Assess mental status using AVPU and AAO x person, place, and time.
  - ✘ Perform neurologic assessment
    - Glasgow coma scale
    - Pupil response
    - Distal CMS
  - ✘ Spinal motion restriction when appropriate.
  
- Exposure
  - ✘ Assess patient's injuries, remove clothing as necessary, considering the condition and environment.

### GENERAL PATIENT ASSESSMENT AND CARE (CONTINUED)

#### History and Physical Examination

- For unstable / unresponsive trauma patients conduct rapid trauma assessment, assessing for signs of trauma including:
  - ✘ Head
    - Fluid from nose, ears, eyes
    - Integrity of skull
  - ✘ Neck
    - JVD
    - Tracheal deviation
  - ✘ Chest
    - Respiration
    - Paradoxical motion
    - Breath sounds
  - ✘ Abdomen
    - Rigidity
    - Distention
  - ✘ Pelvis / GU-GI
    - Pain with motion, stability of pelvis
    - Blood, or incontinence
  - ✘ Extremities
    - Pulse / Sensory / Motor
  - ✘ Posterior
- Obtain base vitals
- Obtain relevant history

### GENERAL PATIENT ASSESSMENT AND CARE (CONTINUED)

- For stable / responsive trauma patients:
  - ✘ Determine chief complaint
  - ✘ Perform focused exam of the injured site and areas indicated by MOI
  - ✘ Obtain baseline vital signs
  - ✘ Obtain Relevant History
  
- For unstable / unresponsive medical patients perform a rapid physical exam
  - ✘ Head and neck
    - JVD
  - ✘ Chest
    - Breath sounds
  - ✘ Abdomen
    - Rigidity
    - Distention
  - ✘ Pelvis / GU-GI
    - Blood, incontinence
  - ✘ Extremities
    - Motor / Sensory / Pulse
    - Medical alert tags
  - ✘ Posterior
  
- Obtain baseline vitals signs
- If possible obtain history of episode from family / bystanders
- If possible obtain relevant past history from family / bystanders

### GENERAL PATIENT ASSESSMENT AND CARE (CONTINUED)

- For stable / responsive medical patients:
  - ✘ Obtain history of episode (OPQRST)
  - ✘ Obtain baseline vitals
  - ✘ Obtain relevant history
  - ✘ Perform a focused physical exam
  
- Perform ongoing assessments as dictated by patient condition.
  - ✘ Unstable patients recommend every 5 minutes
  - ✘ Stable patients recommend every 15 minutes
  
- Treatment protocols
  - ✘ Refer to all appropriate protocols based on your assessment findings.

## HEAT ILLNESS

- Assess oxygenation and administer oxygen
- Remove from hot environment and remove clothing.
- Begin cooling patient with damp cloth and increase air movement over patient.
- Attempt to obtain oral or rectal temperature.
- Obtain vascular access.
  - ✕ If patient is experiencing heat cramps, consider lactated ringers
- If patient is hypotensive or dehydrated, treat per shock protocol.
- Place patient on cardiac monitor as needed.
- Treat seizures per seizure protocol.

## HYPERTENSION

### ACS or STEMI

Use this protocol only if the patient's systolic BP is > 220 or diastolic BP is greater than 120mmHg

### Severe Headache or Stroke Symptoms

Use this protocol if the patient's Systolic BP is > 185 or Diastolic BP is > 110 mmHg

- Assess oxygenation and deliver oxygen as needed.
- Elevate head at least 60 degrees.
- Place patient on cardiac monitor.
- Obtain vascular access.
- Administer labetalol 10 mg over 2 min. You may repeat labetalol at 10-20 mg every 10 min to max dose of 150 mg.
  - ⌘ Monitor HR and BP carefully. Use with caution in patients who have CHF, liver failure, heart blocks, cardiogenic shock, or bradycardia. Labetolol is a non-selective beta blocker. Use in caution in patients with reactive airway disease.

## HYPOTHERMIA / FROSTBITE

- Remove from cold environment into warm environment and avoid rough handling.
- Remove wet clothing and wrap in warm blankets.
- Determine if patient has pulse and is breathing.
  - ⌘ If Yes, get core temperature.
    - if core temperature is 93.2 f-96.8 f begin passive re-warming and active external re-warming.
    - If core temperature is 86 f-93.2 f begin passive re-warming and active external re-warming to trunk areas only.
  - ⌘ If No, start CPR immediately and attach patient to cardiac monitor and defibrillate once if patient is in V-Fib, V-Tach, or pulseless torsades
- Obtain vascular access.
  - ⌘ Infuse warm (109 F) normal saline through IV.
- Ventilate with warm, humid oxygen (108 F to 115 F) if available.
- If core temperature is less than 86 F:
  - ⌘ Continue CPR
    - withhold IV medications
  - ⌘ Limit to one shock for VF/VT
  - ⌘ Transport to hospital
- If core temperature is greater than 86 F:
  - ⌘ Continue CPR
  - ⌘ Give IV medications as indicated but space at longer intervals than normal.
  - ⌘ Repeat defibrillation for VF/VT as core temperature rises.

### Frostbite Treatment

- Remove wet or constrictive clothing and jewelry
- Do not allow limb to thaw if there is a chance of re-freezing
- Do not rub or break blisters
- Follow Pain / Sedation Management Protocol

## LESS THAN LETHAL MUNITIONS CARE

### Overview

Less lethal weapons are discriminate weapons that are explicitly designed and employed to incapacitate personnel while minimizing fatalities and undesired damage to property and the environment. Unlike weapons that permanently destroy targets through blast, fragmentation, or penetration, less lethal weapons have relatively reversible effects on personnel.

- Any patient who has encountered less than lethal munitions needs to have a full assessment to identify any injuries or medical conditions which would require treatment and possible transport to the emergency department.
- In any patient, who has been involved in an encounter with law enforcement and who experienced a great deal of physical activity and who has been placed in restraints, the provider should consider the possibility of In Custody Death. The recent use of drugs, alcohol, obesity, or medical history may increase the risk for sudden cardiac arrest.

### Specific Treatments

#### Pepper Spray (Oleoresin Capsicum) Exposure Care

- Be aware of cross contamination when treating these patients. Severe complications seen in patients with a history of cardiac, COPD, or asthma conditions. Elderly patients are especially susceptible to the effects of spray.
- Flush the affected eye(s) with normal saline using Morgan Lens. Be careful not to cross contaminate by flushing into an unaffected eye.
- If patient is experiencing eye pain secondary to pepper spray, apply Proparacaine to numb the affected eye(s).
- If patient is experiencing respiratory difficulty, treat the patient per the respiratory distress with bronchospasm protocol.

LESS THAN LETHAL MUNITIONS CARE (CONTINUED)

**CS Gas (Tear Gas) Exposure Care**

- Concerns and Treatments are the same pepper spray.

**Taser Dart Care.**

- Assess patient for secondary injuries from falling after being tasered. The energy from a taser can ignite flammable liquids and gasses on or around patient.
- If dart has penetrated the eye or other sensitive area such as the face, neck, or groin, immobilize the darts and cut the wires right above the darts and transport.
- To remove the darts in other areas, pull the skin taut around the dart and pull the dart(s) straight out.
- Clean the site around the wound and apply antibiotic ointment if available. Advise the patient to look for signs of infection.

**Kinetic Impact Munitions Care.**

Some kinetic munitions contain pepper spray or tear gas. Use the same cautions listed for these substances. Severe injuries can result from the blunt force of kinetic munitions. Detailed assessment is necessary for these patients.

Assess and treat with appropriate protocol according to findings and patient signs and symptoms.

## **NAUSEA / VOMITING**

- Assess oxygenation and apply oxygen as needed
- Place patient in position of comfort
- Patient should remain NPO
- Obtain vascular access
- Administer ondansetron 4 mg
  - May repeat once as needed
- Consider placement of nasogastric tube

## PAIN / SEDATION

- Refer to the appropriate protocol for treatment of patient's chief complaint(s).
- Assess oxygenation and apply oxygen as needed.
- Use caution with patients who have SBP < 90.
- Give pain management cautiously to patients who are bradycardic (HR < 60).

### For pain, administer:

- Nitrous oxide as long as the patient is able to follow directions.
- Fentanyl 1 mcg/ kg – 3 mcg/ kg, repeat every 5 minutes.
- Morphine sulfate 2-5 mg every 5 minutes. Titrate to effect.

### For sedation or spasms, administer:

- Midazolam 0.5 - 2mg to a maximum of 10 mg
- Haloperidol 5mg IM

### Concurrent sedation / pain management, administer:

- Fentanyl 1-2 mcg/kg slowly every 5 minutes.
- Morphine sulfate 2-5 mg every 5 minutes
- Midazolam 0.5 - 2 mg every 5 minutes.

Assess and document patient's condition and vital signs before and after treatment (at minimum every 15 minutes). Pain should be assessed using a combination of physiologic indicators, including but not limited to 1-10 pain scale, and Bloomsbury Sedation Scale.

### Bloomsbury Sedation Scale:

- 3= Agitated/Restless
- 2= Awake/Comfortable
- 1= Awake/Calm
- 0= Roused by Voice, Remains Calm
- 1= Roused by Movement/Stimulation
- 2= Roused by Painful Stimulation
- 3= Cannot Arouse

## **POISONING/ OVERDOSE**

Poison Control (775) 982-4129

Chemtrec (800) 424-9300

- Assess scene safety and need to decontaminate patient
- Assess oxygenation and deliver oxygen as needed
- Obtain vascular access as needed
- Place patient on cardiac monitor as needed

### For suspected ingestion

- Consider NG tube placement
- Administer activated charcoal 50 g
  - ⌘ Best if given within 30 min of ingestion
  - ⌘ May not be effective for:
    - strong acids/alkalis
    - ethanol/methanol
    - cyanide
    - ferrous sulfate
  - ⌘ May be withheld when specific antidotes are available or ingestion >4 hours.

### Carbon monoxide (CO)

- Place patient on CO monitor, don't rely on pulse oximeter readings
- If patient's SpCO is:
  - ⌘ 0-3%, no further evaluation of SpCO is needed.
  - ⌘ 3-12%, is patient symptomatic?
    - Yes – Treat with 100% O<sub>2</sub> and transport.
    - No – No further evaluation of SpCO is needed.
  - ⌘ >12%, treat with 100% O<sub>2</sub> and transport.
- If patient has altered LOC, neurological impairment, or >25% SpCO, treat with 100% O<sub>2</sub> and transport to nearest appropriate facility.
- Continue supportive therapies as needed

### Opiates

- Administer naloxone 2 mg for overdose with respiratory compromise, titrate as needed to restore respirations to max of 10 mg.

POISONING/ OVERDOSE (CONTINUED)

Tricyclic Anti-Depressants

- For patients with any of the following:
  - ✘ Dysrhythmias, including QRS abnormalities
  - ✘ Hypotension
  - ✘ Seizure
  - ✘ Cardiac Arrest
- Administer Sodium Bicarb 1meq/kg IV
- If patient is intubated, ventilate patient to maintain ETCO2 level of 28-30

Organophosphate Poisoning (Insecticide)

- Administer atropine 1-2mg every 5 minutes until cessation of secretions



Call for further orders if needed. Consider calling for glucagon in beta blocker OD, and calcium chloride in calcium channel blocker OD.

### **PULMONARY EDEMA**

- Assess oxygenation and deliver oxygen as needed
- Utilize CPAP as necessary to improve patient outcome.
- Place patient in position of comfort with legs dangling if possible
- Obtain vascular access
- Follow advanced airway management as indicated by patient's condition
- Place patient on cardiac monitor
- Treat any underlying dysrhythmias per appropriate protocol
- Administer NTG spray if SBP >100mm/Hg. Repeat every 5 minutes x 3 as needed
- If patient has fulminating edema, apply 1 inch NTG paste topically
- If patient is wheezing, administer albuterol in nebulizer. Repeat as needed.
- Administer furosemide 40mg or double the single home dose up to 80mg.
- If no improvement, administer morphine 2-5mg, titrate to effect.
- If patient is in cardiogenic shock, treat per Cardiogenic Shock Protocol.

## RESPIRATORY DISTRESS WITH BRONCHOSPASM

- Assess oxygenation and deliver oxygen as needed
- Monitor patients ETCO<sub>2</sub> when appropriate
- Obtain vascular access.
- Manage patient's airway using advanced airway management as needed.
- Place patient on cardiac monitor as needed.
- Administer albuterol 2.5mg in 3.0ml NS (0.083% Solution) by nebulizer. Repeat as needed adding ipratropium 2.5ml of 0.02% solution to the 2<sup>nd</sup> and 3<sup>rd</sup> albuterol treatments.
- If patient's condition worsens, administer epinephrine 0.3mg 1:1000 IM\*\*
- Continue with nebulized treatments albuterol only.
- If patient does not respond to treatments Consider epinephrine 0.1mg in 100 cc normal saline run wide open. May repeat to max of 0.3 mg\*\*
- If patient is intubated, consider 0.5mg epinephrine ETT\*\*
- Utilize CPAP as necessary to improve patient outcome.



\*\*If patient's age is > 45, has previous cardiac history, or hypertension

## SEIZURES

- Assess oxygenation and administer oxygen as needed
- Protect patient injury.
- Check for pulse after seizure stops.
- Obtain vascular access.
- Place patient on cardiac monitor as needed.
- Check blood glucose
- Follow Advanced Airway Management Protocol as Indicated by patient's condition.
- If patient is actively seizing, administer midazolam 2mg IV/IO/Nasal every 3 minutes up to 10 mg or 0.07 mg/kg (max 7mg) IM
- If seizure is late in pregnancy, consider eclampsia and administer 4 g of magnesium sulfate as follows:
  - ⌘ Mix 4 grams  $MgSO_4$  in 100 ml NS; run IV/IO over 20 minutes (300 cc/hr), following Versed administration and cessation of seizure.
    - In the event of respiratory depression, hypotension or bradycardia that may be encountered after administration of  $MgSO_4$  to these patients:
      - administer 5 ml calcium chloride (13.6 mEq/10ml vial) slowly
  - ⌘ Patients receiving magnesium IV must have continuous EKG and  $SpO_2$  monitoring

## SHOCK – HYPOVOLEMIC

- Assess oxygenation and deliver oxygen as needed.
- Place patient supine and elevate legs if possible.
- Obtain vascular access
  - ✕ Large bore IV preferred
  - ✕ Obtain 2 if possible
- Place patient on cardiac monitor.
- Follow Advanced Airway Management Protocol as indicated by patient's condition.
- Administer fluid bolus IV up to 2000ml to maintain systolic BP >90mmHg. Reassess BP and check for fluid overload after every 500ml.



Call for further fluid administration

## SHOCK – CARDIOGENIC

If hypotension following cardiopulmonary arrest or MI

- Assess oxygenation and administer O2 as needed
- Cardiac monitor
  - ⌘ If HR < 60, follow bradycardia protocol.
  - ⌘ If HR > 150 follow Tachycardia protocols.
- 12 lead EKG
- Obtain vascular access
  - ⌘ Large bore IV preferred
  - ⌘ Obtain 2 if possible
- Assess lung sounds
  - ⌘ If clear, administer bolus of 500cc NS if SBP <90. If right ventricular infarct suspected, may need additional fluid.
  - ⌘ Reassess lung sounds and BP after each bolus.
- If HR between 60-120 and SBP remains <90, Dopamine 5-20mcg/kg/minute IV drip. Titrate until SBP > 90.
- Follow Advanced Airway Management Protocol as indicated by patient's condition.

### TRAUMA

- Assess oxygenation and administer oxygen as needed
- Control hemorrhage:
  - ✧ Direct pressure, elevation, pressure points, and lastly apply a tourniquet
- Wound Care as necessary:
  - ✧ Irrigate wound with normal saline or sterile water
  - ✧ Cleanse wound with hydrogen peroxide
  - ✧ Apply triple antibiotic ointment and bandage
- Immobilize suspected fractures and dislocations. In case of severe deformity with distal cyanosis or loss of circulation, apply gentle in-line traction before splinting. Document presence/absence of pulse before and after immobilization. Cover open fractures with sterile dressing.
- Stabilize flail segments in chest wall with appropriate means.
- If a sucking chest wound is suspected, seal the wound with an occlusive dressing. If the patient's breathing becomes worse, lift one corner of the dressing to release pressure, then reseal.
- Impaled objects must be left in place, and should be stabilized by building up around the object with bulky dressings, taking care that the object can do no further damage.
- Cover eviscerated bowel with sterile saline soaked trauma dressing and stabilize.
- Do not attempt to stop free drainage from nose or ears. Cover lightly to avoid contamination.
- Obtain vascular access.
- If patient has signs of hypoperfusion, use shock protocol.
- Follow advanced airway management protocol as indicated by patient's condition.
- Place patient on cardiac monitor as indicated.
- If patient's signs and symptoms indicate the presence of a tension pneumothorax, perform a needle thoracentesis on the affected side.
- When appropriate, consider pain/sedation protocol.

# PEDIATRIC TREATMENT PROTOCOLS

## **ADRENAL INSUFFICIENCY (CONGENITAL ADRENAL HYPERPLASIA)**

Patients requiring emergency treatment will have any of the following symptoms:  
Respiratory distress, Shock, Altered level of consciousness

Patients must have clinical diagnosis of CAH to be eligible for treatment under this protocol

- Assess oxygenation and administer oxygen as needed
- Place patient on cardiac monitor
- Manage airway as indicated by patient condition
- Obtain Vascular Access
- If patient assessment indicates hypoperfusion, consider Shock Protocol
- Assess for signs of fluid overload
- Treat respiratory illness with appropriate protocol
- Determine blood glucose level

### Treatment



- Administer hydrocortisone sodium succinate
  - 1-2 mg/kg IV/IO/IM for children
- Repeat glucose check 30 minutes after treatment and document

## AIRWAY OBSTRUCTION

- Attempt assisted ventilations using a bag-valve-mask device with high-flow, 100% concentration oxygen. If unsuccessful, reposition airway and attempt bag-valve-mask assisted ventilation again.
- Use age-appropriate techniques to dislodge the obstruction (for infants younger than one year of age, apply back blows with chest thrust; for children one year and older, use abdominal thrusts).
- Choking / conscious
  - ✘ Ask if patient is able to speak to establish level of obstruction.
  - ✘ If unable to speak, apply heimlich abdominal thrusts until FBO is relieved or patient becomes unconscious.
  - ✘ For infants with FBO, position infant and give 5 back blows and 5 chest compressions. Check airway and if object is seen, remove it. Continue sequence as needed.
- Choking / unconscious
  - ✘ If patient is unconscious or becomes unconscious while trying to relieve obstruction, position head, finger sweep, and try to ventilate.
- If unsuccessful, place patient supine and perform 5 abdominal thrusts in children or 5 chest compressions in infants.
- Apply finger sweep, remove dentures if present.
- Suction as needed.
- Consider possibility of croup or epiglottitis, follow respiratory distress protocol.
- If prior BLS / ILS attempts fail, try to visualize obstruction with laryngoscope and remove it with McGill forceps, taking care not to cause further obstruction.
- If unsuccessful, a needle cricothyroidotomy may be necessary.

**ALTERED LEVEL OF CONSCIOUSNESS**  
**GLASCOW COMA SCALE < 15**

- Manage airway as indicated by patient condition.
- Obtain vascular access.
- If patient assessment indicates hypoperfusion, consider shock protocol.
- determine blood glucose level. (heel stick for < 6 months)
- If blood glucose level is <60 (>1 month) or <40 (<1 month) give dextrose.
  - ⌘ < 1 month give 2 ml/kg d10
  - ⌘ >1 month give 2 ml/kg d25
- If clinically indicated give narcan 0.1 mg/kg and repeat as necessary.
- Follow advanced airway management protocol, as indicated by patient's condition.
- Place patient on cardiac monitor.
- Treat any associated injuries as needed.

## ALLERGY / ANAPHYLAXIS

- Assess oxygenation and administer O2 as needed.
- Assess degree of allergic reaction:
  - ✧ *mild*: generalized hives, swelling, itching.
  - ✧ *moderate*: mild symptoms with wheezing and difficulty swallowing.
  - ✧ *severe*: impending respiratory failure and hypotension.
- Obtain vascular access.
- If patient's signs and symptoms indicate hypoperfusion, administer an IV fluid challenge per shock protocol.
- Manage airway with advanced airway management as indicated by patient's condition.
- Place patient on cardiac monitor.
- For *mild* reaction administer diphenhydramine 1 mg/kg (max 50 mg)
- For *moderate* reaction, administer:
  - ✧ diphenhydramine 1 mg/kg (max 50 mg)
  - ✧ albuterol unit dose 2.5mg in 3.0ml by nebulizer x 3
  - ✧ epinephrine 0.01 mg/kg 1:1000 IM (0.3 mg max)
- For *severe* reaction, administer:
  - ✧ diphenhydramine 1 mg/kg (max 50 mg)
  - ✧ epinephrine 0.01 mg/kg of 1:10000 IV, followed by 20ml/kg normal saline bolus.

## BURNS

- Remove any smoldering non-adherent clothing and jewelry from patient. If chemical burn, remove all clothing with chemical contamination to limit exposure.
- Stop the burning process with water or saline. For chemical burns, flush with water for 15 minutes if possible and patient stable.
- Monitor airway for signs of impending obstruction.
- Estimate involved body surface area using rule of nines.
- Cover burns with sterile dressings. If burns are <10% BSA, use moist sterile dressing for patient comfort. If burns are >10% BSA, cover with dry dressings.
- Access and treat as needed any associated injuries or symptoms.
- Manage airway as indicated by patient's condition.
- Obtain vascular access.
- Administer IV fluids as follows:
  - ⌘ If transport time is greater than 15 minutes, calculate fluid administration using  $4cc\ LR\ or\ NS\ x\ weight\ in\ kg\ x\ \% \ BSA = total\ fluid$ , then:
    - Administer 50% of total fluids in first 8 hours from time of injury.
    - Administer 50% of total fluids over next 16 hours.
  - ⌘ If transport time is less than 15 minutes, give 20 ml/kg bolus and repeat PRN.
- Place patient on cardiac monitor. Treat dysrhythmias per appropriate protocol.
- Consider pain and sedation protocol.

## CARDIAC ASYSTOLE

- Begin CPR.
- Manage airway as indicated
- Obtain vascular access.
- Search for and treat causes of arrest.
- Manage airway using advanced airway management protocol.
- Place patient on cardiac monitor.
- Administer epinephrine 0.01mg/kg repeat every 3-5 minutes.
- If the pediatric patient is still asystolic after 3 rounds of medications:



Consult medical control for:

- Possible administration of sodium bicarbonate.
- Termination of efforts.
  - ⌘ *Prior to termination efforts, a minimum of 3 rounds of medications must be given.*

## **CARDIAC BRADYCARDIA**

- Administer O<sub>2</sub> to ensure adequate oxygenation. Bradycardia in the pediatric patient is most often due to hypoxia.
- If the heart rate is < 60 in the infant, begin chest compressions.
- Manage patient's airway as indicated by patient's condition.
- Obtain vascular access.
- Place patient on cardiac monitor.
- Administer epinephrine 0.01 mg/kg every 3-5 minutes.
- Refractory treatments include:
  - ✕ atropine 0.02 mg/kg (min dose 0.1 mg / max dose 0.5 mg)
  - ✕ transcutaneous pacing

## CARDIAC PULSELESS ELECTRICAL ACTIVITY

- Begin CPR.
- Manage airway as indicated.
- Obtain vascular access.
- Search for and treat causes of arrest.
- Place patient on cardiac monitor.
- Administer epinephrine 0.01mg/kg repeat every 3-5 minutes



Consult medical control for:

- Possible administration of sodium bicarbonate.
- Termination of efforts.
  - ✧ *Prior to termination efforts, a minimum of 3 rounds of medications must be given.*

## CARDIAC SUPRAVENTRICULAR TACHYCARDIA

Infants HR > 220

Children HR >180

- Assess oxygenation and deliver oxygen as needed.
- Manage patient's airway as indicated by patient's condition.
- Obtain vascular access.
- Place patient on cardiac monitor.
- Stable patients are conscious, alert, without signs of poor perfusion
  - ⌘ Contact medical control for orders
- Unstable patients are altered, with signs of poor perfusion
  - ⌘ Attempt vagal maneuvers.
    - Blow through straw
    - Carotid massage
  - ⌘ If unsuccessful, consider adenosine.
    - first dose 0.1 mg/kg (max 6 mg)
    - second dose 0.2 mg/kg (max 12 mg)
    - third dose 0.2 mg/kg (max 12 mg)
- If unsuccessful or IV/IO is not established, perform synchronized cardioversion at 0.5 j/kg increasing to 1 j/kg
  - ⌘ consider Pain/Sedation Management Protocol
- *Remember to run a continuous EKG strip during procedures.*

## CARDIAC V-FIB OR PULSELESS V-TACH

- Initiate CPR until monitor is attached and continue throughout as needed.
  - ✘ *If no CPR has been given prior to arrival, perform 2 minutes of CPR prior to defibrillation attempts. Maintain constant CPR throughout code with minimal interruptions (10 seconds or less)!*
- Manage patient's airway as indicated by patient's condition.
- Obtain vascular access.
- Attach patient to monitor and pads. Defibrillate at 2 j/kg (first shock)
- Administer epinephrine 0.01mg/kg every 3-5 minutes
- Defibrillate at 4 j/kg (second and successive shocks)
- Administer an antidysrhythmic:
  - ✘ *Consider MgSO<sub>4</sub> 25-50 mg/kg (max 2 g) if torsades de pointes is suspected.*
  - ✘ amiodarone 5 mg/kg (max 15 mg/kg)
  - ✘ lidocaine 1 mg/kg (max 3 mg/kg)



Contact medical control for further orders.

## CARDIAC WIDE COMPLEX TACHYCARDIA WITH PULSE

- Administer oxygen
- Manage airway indicated by patient's condition.
- Obtain vascular access.
- Place patient on cardiac monitor.
- if patient is hemodynamically stable:
  - ✕ consider adenosine
    - first dose 0.1 mg/kg (max 6 mg)
    - second dose 0.2 mg/kg (max 12 mg)
    - third dose 0.2 mg/kg (max 12 mg)
  - ✕ amiodarone 5 mg/kg in 100 ml ns over 20 minutes.
  - ✕ lidocaine 1 mg/kg
  - ✕ *administer MgSO4 25-50 mg/kg over 5-60 minutes if torsades is suspected.*
- If patient is hemodynamically unstable, perform synchronized cardioversion at 0.5-1 j/kg.
  - ✕ If patient is conscious, consider Pain / Sedation Protocol prior to cardioversion.



Contact medical control for further orders.

### GENERAL PATIENT ASSESSMENT AND CARE

Purpose: To give a standard of care for NLTFPD on all EMS calls.

- Review the dispatch information while en route
- Consider body substance isolation (bsi)
- Evaluate scene safety
- determine number of patients
- Consider the need for additional resources

#### Patient Approach

- Determine the mechanism of injury or nature of illness.
- If appropriate, begin triage and initiate mass casualty incident (MCI)

#### Initial Assessment

- Airway
  - ⌘ open and establish airway
    - head tilt – chin lift (if no suspicion of c-spine injury)
    - jaw thrust (if c-spine injury suspected)
  - ⌘ suction as necessary
  - ⌘ if necessary, insert airway adjunct
    - oral airway if gag reflex is absent
    - nasal airway if gag reflex is present
  - ⌘ if airway blocked by FBO, attempt to relieve with airway obstruction techniques.

### GENERAL PATIENT ASSESSMENT AND CARE (CONTINUED)

- Breathing
  - ✘ determine if breathing is adequate
    - If patient's ventilations are not adequate, provide assistance with 100% O<sub>2</sub> using bag-valve-mask (BVM) or CAREvent ventilator
  - ✘ administer O<sub>2</sub> as appropriate.
    - 2-6 Lpm through nasal cannula
    - 6-15 Lpm through simple face mask
    - 12-15 Lpm through NRB
  - ✘ Use pulse oximetry to determine appropriate interventions
  
- Circulation
  - ✘ assess brachial, radial, or carotid pulse.
  - ✘ assess for and manage bleeding
  - ✘ assess skin color, temperature, and capillary refill
  
- Disability
  - ✘ Assess mental status using AVPU and AAOxPPT.
  - ✘ Perform neurologic assessment
    - Glasgow coma scale
    - pupil response
    - distal CMS
  - ✘ Spinal motion restriction when appropriate.
  
- Exposure
  - ✘ assess patient's injuries, remove clothing as necessary, considering the condition and environment.

## GENERAL PATIENT ASSESSMENT AND CARE (CONTINUED)

### History and physical examination

- For *unstable / unresponsive* trauma patients conduct rapid trauma assessment, assessing for signs of trauma
  - ✕ Head
    - fluid from nose, ears, eyes
    - integrity of skull
  - ✕ Neck
    - JVD
    - tracheal deviation
  - ✕ Chest
    - respiration
    - paradoxical motion
    - breath sounds
  - ✕ Abdomen
    - rigidity
    - distention
  - ✕ Pelvis / GU-GI
    - pain with motion, stability of pelvis
    - blood, or incontinence
  - ✕ Extremities
    - pulse / sensory / motor
  - ✕ Posterior
- Obtain base vitals
- Obtain relevant history
  
- For *stable / responsive* trauma patients:
  - ✕ determine chief complaint
  - ✕ perform focused exam of the injured site and areas indicated by MOI
  - ✕ obtain baseline vital signs
  - ✕ obtain relevant history

### GENERAL PATIENT ASSESSMENT AND CARE (CONTINUED)

- For *unstable / unresponsive* medical patients perform a rapid physical exam
  - ✘ head and neck
    - JVD
  - ✘ Chest
    - breath sounds
  - ✘ Abdomen
    - rigidity
    - distention
  - ✘ Pelvis / GU-GI
    - blood, incontinence
  - ✘ Extremities
    - motor / sensory / pulse
    - medical alert tags
  - ✘ Posterior
- Obtain baseline vitals signs
- If possible obtain history of episode from family / bystanders
- If possible obtain relevant past history from family / bystanders
  
- For *stable / responsive* medical patients:
  - ✘ obtain history of episode (OPQRST)
  - ✘ obtain baseline vitals
  - ✘ obtain relevant history
  - ✘ perform a focused physical exam
  
- Perform ongoing assessments as dictated by patient condition.
  - ✘ Unstable patients recommend every 5 minutes
  - ✘ Stable patients recommend every 15 minutes
  
- Treatment protocols
  - ✘ Refer to *all* appropriate protocols based on your assessment findings.

## HEAT ILLNESS / FEVER

- Remove from hot environment and remove clothing.
- Begin cooling patient with damp cloth and increase air movement over patient.
- Attempt to obtain oral or rectal temperature.
- Manage patient's airway as indicated.
- Obtain vascular access.
- Place patient on monitor as indicated.
- If patient is hypotensive or dehydrated, treat per shock protocol.
  - ⌘ *if patient is experiencing heat cramps, consider lactated ringers*
- If patient has temperature is >100° orally or >101° rectally, and hasn't had acetaminophen in the past 4 hours:
  - ⌘ Administer 15 mg/kg acetaminophen
- Treat seizures per Seizure Protocol.

### HYPOTHERMIA

- Remove from cold environment into warm environment and avoid rough handling.
- Remove wet clothing and wrap in warm blankets.
- Determine if patient has pulse and is breathing.
- If *yes*, obtain core temperature.
  - ✧ If core temperature is 93.2 F-96.8 F begin passive rewarming and active external rewarming.
  - ✧ If core temperature is 86 F-93.2 F begin passive rewarming and active external rewarming to *truncal areas only*.
- If *no*, start CPR immediately and attach patient to aed and give 1 shock (2j/kg) if patient is in v-fib or v-tach.
- Manage airway as indicated by patient's condition.
- Obtain vascular access.
  - ✧ Infuse warm normal saline.
- Ventilate with warm, humid oxygen if available.
- If core temperature is *less than 86 f*:
  - ✧ continue CPR
  - ✧ withhold medications
  - ✧ limit to one shock for VF/VT
  - ✧ transport to hospital
- If core temperature is *greater than 86 f*:
  - ✧ continue CPR
  - ✧ Give medications as indicated but space at longer intervals than normal.
  - ✧ Repeat defibrillation for VF/VT as core temperature rises.

## **NAUSEA / VOMITING**

- Place patient in position of comfort.
- NPO
- Obtain vascular access.
- Administer ondansetron 0.15 mg/kg (max 4 mg)
  - May repeat once
- Consider placement of nasogastric tube.

## NEONATAL RESUSCITATION

- Place patient in head-down position and suction airway – *mouth then nose*.
- Dry infant, provide tactile stimulation and keep warm.
- Check respiratory rate
  - ⌘ >20 - provide oxygen as indicated
  - ⌘ < 20 - provide 100% O<sub>2</sub>
    - BVM or intubate (3.0 ETT for full term)
- If meconium stained amniotic fluid
  - ⌘ For vigorous newborn assess heart rate
  - ⌘ For compromised newborn intubate after delivery and suction through ET tube using aspirator as tube is withdrawn, re-intubate and suction again until no further meconium is present.
- Check heart rate
  - ⌘ 100 - no action
  - ⌘ 60 to 100 - assist ventilation with 100% O<sub>2</sub> BVM
  - ⌘ < 60 - begin chest compression at 120/minute
    - Establish IV or IO
    - 10ml/kg NaCl over five minutes. Reassess and repeat as needed
    - Give epinephrine 0.01mg/kg (1:10,000) q 5 minutes if heart rate is less than 60 despite adequate ventilation and a one minute cycle of compression (if not contraindicated)
- Check color
  - ⌘ Normal or peripheral cyanosis - no action
  - ⌘ Central cyanosis - provide 100% O<sub>2</sub> and assist ventilation as needed
- Check glucose
  - ⌘ if < 40 administer
    - D10 2ml/kg over five minutes
- Administer naloxone 0.1mg/kg if apnea or minimal respiratory effort. May repeat every 2-3 minutes as needed.

## PAIN / SEDATION

- Refer to the appropriate protocol for treatment of patient's complaint.
- Place patient in position of comfort.
- Assess oxygenation and deliver oxygen as needed.
- Consider nitrous oxide, as long as the patient is *able* to follow the directions.
- Obtain vascular access.

*For pain*, administer:

- ⌘ fentanyl 1 mcg/kg – 3 mcg/kg repeat q 5 minutes as needed, titrate to effect.
- ⌘ morphine sulfate 0.1 mg/kg q 5 minutes, titrate to effect.

*For sedation or spasms*, administer:

- ⌘ midazolam 0.1 mg/kg

*Concurrent sedation / pain management*, administer:

- ⌘ fentanyl 1-2 mcg/kg q 5 minutes.
- ⌘ morphine 0.1 mg/kg q 5 minutes
- ⌘ midazolam 0.1 mg/kg q 5 minutes.

Assess and document patient's condition and vital signs before and after treatment (at minimum every 15 minutes). Pain should be assessed using a combination of physiologic indicators, including but not limited to, 1-10 pain scale, and Bloomsbury Sedation Scale.

Bloomsbury sedation scale:

- 3= agitated/restless
- 2= awake/comfortable
- 1= awake/calm
- 0= roused by voice, remains calm
- 1= roused by movement/stimulation
- 2= roused by painful stimulation
- 3= cannot arouse

## **POISONING/ OVERDOSE**

Poison Control (775) 982-4129

Chemtrec (800) 424-9300

- Assess scene safety and need to decontaminate patient.
- Assess oxygenation and deliver oxygen as needed.
- Obtain vascular access.
- Manage patient's airway as indicated by patient's condition.
- Place patient on cardiac monitor as needed.

### **For suspected ingestion**

- ✕ Consider NG tube placement
- ✕ administer activated charcoal 1 g/kg
  - best if given within 30 min of ingestion

### **Carbon Monoxide**

- ✕ place patient on co monitor, don't rely on pulse oximeter readings
- ✕ if patient's SPCO is:
  - 0-3%, no further evaluation of spco is needed.
  - 3-12%, is patient symptomatic?
    - yes – treat with 100% O2 and transport.
    - no – no further evaluation of spco is needed.
  - >12%, treat with 100% O2 and transport.
  - if patient has altered loc, neurological impairment, or >25% SpO2, treat with 100% O2 and transport to nearest appropriate facility.
  - continue supportive therapies as needed

### **Opiates**

- Administer naloxone 0.1 mg/kg for overdose with respiratory compromise, may repeat every 2 min PRN.

POISONING/ OVERDOSE (CONTINUED)

**Tricyclic**

- For patients with any of the following:
  - ✕ dysrhythmias
  - ✕ hypotension
  - ✕ seizure
  - ✕ cardiac arrest
    - administer sodium bicarb 1meq/kg IV
    - if patient is intubated, ventilate patient to EtCO<sub>2</sub> of 28-30

**Organophosphate Poisoning**

- Administer atropine 0.02 mg/kg every 5 minutes until cessation of secretions



Call for further orders if needed.

## RESPIRATORY DISTRESS WITH BRONCHOSPASM

- Assess oxygenation and administer oxygen as indicated.
- Obtain vascular access.
- Manage patient's airway using advanced airway management as needed.
- Place patient on cardiac monitor.
- Administer Albuterol 2.5mg by nebulizer. May repeat as needed.
- If patient's condition worsens, administer epinephrine 0.01mg/kg 1:1000 IM
- If no response, administer epinephrine 0.01mg/kg 1:10000 IV
- For croup, administer epinephrine by nebulizer:
  - ⌘ < 6 months, 0.25 mg in 2.5 ml saline
  - ⌘ >6 months, 0.5 mg in 2.5 ml saline

## SEIZURES

- Protect patient from further injury.
- Check for pulse after seizure stops. if no pulse detected, begin CPR and place patient on AED and treat as indicated.
- Obtain vascular access.
- If blood glucose level is <60 (>1 month) or <40 (<1 month) give dextrose.
  - ⌘ < 1 month give 2 ml/kg d10
  - ⌘ >1 month give 2 ml/kg d25
- Manage airway as indicated by patient's condition.
- Place patient on cardiac monitor as indicated.
- If patient is actively seizing, administer versed 0.2mg/kg q 3minutes to a max of 7 mg.
- If oral temperature is > 100° or rectal temperature is > 101° and child has not had acetaminophen in the last 4 hours, give acetaminophen 15mg/kg. you may use child's home medication to complete dosing.

## **SHOCK – HYPOVOLEMIC**

- Assess oxygenation and administer oxygen.
- Place patient on cardiac monitor.
- Manage airway as indicated by patient's condition.
- Place patient supine and elevate legs if possible.
- Obtain vascular access with large bore needles.
  - ⌘ Administer fluid bolus of 20 ml/kg (10ml/kg neonate) repeat as needed.  
Reassess BP and fluid overload after each bolus.

### TRAUMA

- Assess oxygenation and administer oxygen as needed.
- Obtain vascular access.
- Place patient on cardiac monitor.
- If patient has signs of hypoperfusion, use shock protocol.
- Follow advanced airway management protocol as indicated by patient's condition.
- Control hemorrhage:
  - ✧ Direct pressure, elevation, pressure points, and lastly apply a tourniquet
- Wound Care as necessary:
  - ✧ Irrigate wound with normal saline or sterile water
  - ✧ Cleanse wound with hydrogen peroxide
  - ✧ Apply triple antibiotic ointment and bandage
- Immobilize suspected fractures and dislocations. In case of severe deformity with distal cyanosis or pulselessness, apply gentle in-line traction before splinting document presence/absence of pulse before and after immobilization. Cover open fractures with sterile dressing.
- Stabilize flail segments in chest wall with appropriate means.
- If a sucking chest wound is suspected, seal the wound with an occlusive dressing taped on 3 sides. If the patient's breathing becomes worse, lift one corner of the dressing to release pressure, then reseal.
- Impaled objects *must* be left in place, and *should* be stabilized by building up around the object with multi-trauma dressings, etc., taking care that the object can do no further damage.
- Cover eviscerated bowel with sterile saline soaked trauma dressing and stabilize.
- *Do not* attempt to stop free drainage from nose or ears. Cover lightly to avoid contamination.
- If patient's signs and symptoms indicate the presence of a tension pneumothorax, perform a needle thoracentesis on the affected side.
- When appropriate and not contraindicated, consider pain/sedation protocol.

# PROCEDURES

## APPROVED PROCEDURES

### EMT-Basic

- Open and establish airway (OPA/NPA)
- Suction
- Relieve foreign body obstructions per current AHA recommendations
- Cardiopulmonary resuscitation per AHA recommendations
- Provide ventilatory assistance using bag-valve-mask (BVM) or ventilator
- Use pulse oximetry or carboxyhemoglobin monitor
- Assess Circulation
- Defibrillation (manual mode with ALS provider / AED mode otherwise)
- Assess for and Manage Bleeding
- Assess Mental Status
- Blood Glucose Testing
- C-Spine Immobilization
- Place and acquire 4-lead and 12-lead EKG
- Setting up CPAP onto patients
- Medication administration from approved list

### EMT-INTERMEDIATE *(in addition to EMT-Basic skills)*

- Establish intravenous/intraosseous access
- Supraglottic airway device insertion (KING Airway)

### PARAMEDIC *(in addition to EMT-Basic and Intermediate skills)*

- Needle thoracostomy
- Defibrillation, transcutaneous pacing, and synchronized cardioversion
- Orotracheal and nasotracheal intubation
- ECG rhythm interpretation, 12-lead Interpretation
- Needle and surgical cricothyroidotomy
- NG tube insertion
- Medication assisted intubation
- CPAP

## **ADVANCED AIRWAY MANAGEMENT**

- Assess oxygenation, administer oxygen including BVM assistance with OPA or NPA
- Maintain cardiac monitoring
- Maintain continuous pulse oximetry
- Maintain continuous end tidal CO<sub>2</sub> capnography
- Obtain vascular access
- Prior to insertion of advanced airway device hyperoxygenate the patient with 100% O<sub>2</sub> via BVM or CAREvent ventilator
- After successful insertion of advanced airway device, consider nasogastric-  
orogastric tube insertion for relief of gastric distension impairing adequate  
ventilation.
- If difficult to control airway due to excessive gag reflex in instances for which  
protecting the airway is a potential life saving maneuver see MEDICATION  
ASSISTED AIRWAY procedure.
- If unable to orally or nasally intubate the trachea, unable to insert or use a  
KING Airway, but adequate oxygen saturation and airway protection can be  
maintained with BVM and Sellick's maneuver, the patient may be transported  
without an advanced airway.
- If unable to orally or nasally intubate the trachea, unable to insert or use a  
KING Airway, and if an upper airway obstruction prevents maintaining an open  
airway, surgical cricothyrotomy should be considered.

### ADVANCED AIRWAY MANAGEMENT (CONTINUED)

- Verify advanced airway device tube placement.
  - The following items MUST be completed and documented on the PCR:
    - Visualization of cords (orotracheal intubation)
    - Use of quantitative Capnography
    - Positive bilateral breath sounds
    - Negative epigastric sounds
    - Reverification of patency after EVERY patient move.
    - Secure adjunctive airway device with commercial tube holder or tape.
  
- All patients with advanced airway device who have potential for spontaneous movement should be restrained with soft wrist restraints to prevent advanced airway device from being dislodged.
- Consider immobilization with C-collar and backboard to protect advanced airway device from becoming accidentally dislodged.
- Patients who clinically deteriorate should have the advanced airway device position immediately verified using the techniques above.

During CPR after advanced airway device is placed, rescuers no longer deliver “cycles” of CPR. Give continuous chest compressions w/o pauses for breaths. Give 8-10 breaths/min. Check rhythm every 2 minutes.

\*\*NLTFPD utilizes quantitative capnography to measure exhaled CO<sub>2</sub> as a standard of care. Values of 35-45 mmHg are expected in a healthy perfusing adult. In cases of equipment malfunction or as a backup only, ETCO<sub>2</sub> may be measured using a qualitative Easy-Cap with an expected color change of yellow as verification. Every attempt should be made to verify tube placement with quantitative capnography.

## CAREVENT ALS VENTILATOR

The CAREvent® ALS BLS Handheld Resuscitator is designed to provide emergency ventilatory support to patients suffering from respiratory and/or cardiac arrest.

### SET UP

Connect to oxygen regulator with a 60 PSI 9/16 DISS outlet. The regulator must be able to output a minimum of 120 L/min at no less than 45 PSI.

### Manual Ventilation and Cardiac Compressions

The CAREvent® ALS Handheld Resuscitator has a Manually Actuated, Automatic Ventilation Override Button (Manual Button) to assist in the timing of ventilations in conjunction with external cardiac compressions. By using the Manual Button”, the operation of the ventilator can be easily timed with the chest compressions so as to avoid the potential problem of the aspiration of stomach contents due to gastric distension which may occur if overlap of chest compression and inflation occurs.

### Automatic Ventilation

- Attach the ventilator circuit to advanced airway device or face mask.
- Attach ventilator to ventilator circuit.
- Select appropriate rate and volume

Control Position	1	2	3	4	5	6
Tidal Volume Vt (ml)	150	200	300	400	500	600
	200	300	400	600	800	1100
Frequency (BPM)	20	20	10	10	10	10
	20	18	18	12	12	12
Minute Volume Vm (lts)	3.0	4.0	3.0	4.0	5.0	6.0
	4.0	4.5	6.0	7.2	9.6	13.2
Automatic flowrate (L/min)	9.0	12.0	9.0	12.0	15.0	18.0
	12.0	13.5	18.0	21.6	28.8	38.6
Body Weight (kg) min.	21	28	42	57	71	85
(6-7 ml/kg) max.	25	34	50	67	84	100

### CAREVENT ALS VENTILATOR (CONTINUED)

- If you have been ventilating manually simply release the manual button and after a short pause (5 - 8 seconds), the ventilator will commence automatic cycling at the rate and volume selected. If you are commencing automatic ventilation immediately, rotate the setting selector to the setting appropriate for the size of patient being ventilated and the ventilator will commence automatic cycling.
- Closely observe the patient's chest movements. If there is any obstruction in the patient's airway (blow off valve will operate).
- Should the patient commence spontaneous breathing the CAREvent® ALS will sense the patient's inspiratory effort and will stop cycling automatically allowing the patient to "Demand Breathe" at their own rate and volume on 100% oxygen. If they cease spontaneous breathing the ventilator will recommence automatic cycling after a delay of 5 - 8 seconds (depending on the depth of the patient's previous respiration) without intervention by the rescuer.
- Never leave patient unattended.

### **KING AIRWAY**

The KING airway is a single-use device intended for airway management. It may be used as a rescue airway device when other airway management techniques have failed; or as a primary device when advanced airway management is required in order to provide adequate ventilation.

The KING airway does not require direct visualization of the airway or significant manipulation of the neck. The main use for the KING airway is in cardiac arrest situations. A KING airway may be considered preferable for initial use in patients who are obese or who have short necks, patients with limited neck mobility, or when visualization of the airway is difficult due to blood or emesis in the airway. A paramedic is not required to attempt endotracheal intubation before opting to use a KING airway.

KING airways are not well tolerated in patients with intact gag reflexes and should not be used in patients with perfusing pulses unless all other methods of ventilation have failed.

Placement of a KING may be attempted three times. Ventilations should be interrupted for no more than thirty seconds per attempt. Patients should be ventilated with 100% oxygen for one minute via bag-valve-mask device between attempts. If attempts at placement of an advance airway are unsuccessful after three attempts, BLS airway measures shall be resumed.

The King Airway is approved for use in the following sizes. Cuff inflation varies by size:

Size 3 – Patients between 4 and 5 feet tall (55 mL air)

Size 4 – Patients between 5 and 6 feet tall (70 mL air)

Size 5 – Patients over 6 feet tall (80 mL air)

### KING AIRWAY (CONTINUED)

#### CONTRAINDICATIONS

- Presence of a gag reflex
- Caustic ingestion
- Known esophageal disease (e.g. cancer, varices, stricture)
- Laryngectomy with stoma
- Height less than 4 feet

Note: Airway deformity due to prior surgery or trauma may limit the ability to adequately ventilate with a KING airway due to the potential for poor seal of the pharyngeal cuff.

#### REQUIRED EQUIPMENT

- Suction
- King Airway Kit (size 3, 4, or 5)
- Bag-valve-mask
- Stethoscope

#### PROCEDURE FOR USE

- Assure adequate BLS airway (if possible)
- Utilize the pocket card supplied with the KING Airway for sizing and insertion instructions
- Ventilate with 100% oxygen while selecting appropriate size King Airway
- Test cuff of device by injecting the recommended amount of air into the cuffs. Fully deflate prior to insertion.
- Apply water-based lubricant to distal tip and posterior aspect of tube. Avoid application of lubricant into ventilatory openings.
- Position head into the “sniffing position”. Neutral position may be used for suspected cervical spine injury.
- Hold mouth open and apply chin lift (jaw-thrust for suspected c-spine injury).
- Insert tube rotated laterally at 45-90 degrees with blue orientation stripe touching corner of mouth. Advance behind base of tongue. Do not force.
- Once tube has passed under tongue, rotate tube back to midline with the blue orientation stripe midline and up towards chin.

### KING AIRWAY (CONTINUED)

- Advance tube until base connector aligns with teeth or gums.
- Inflate cuff of tube to required volume,
- Attach bag-valve-mask and ventilate patient, confirm placement by rise and fall of the chest, present lung sounds, negative epigastric sounds, and capnography.
- Secure tube and note depth marking of tube.
- Continue monitoring placement of tube throughout pre-hospital treatment and transport.
- Document placement on PCR

### REMOVAL

Once a KING airway is placed, ideally it should not be removed. Circumstances that necessitate removal of the device may include presence of a gag reflex or inadequate ventilation with the device. Removal of the device may cause vomiting and the following steps should be followed:

- Position patient on side, maintain spinal precautions as needed.
- Have suction available.
- Deflate cuff/cuffs completely and remove smoothly and quickly.
- Reassess airway and breathing to evaluate the need for other adjuncts.

## MEDICATION ASSISTED AIRWAY PROCEDURE

### Preparation

Have the following equipment ready:

- Bag-valve-mask connected to functioning oxygen delivery system
- Working suction with Yankauer suction tip
- Full intubation kit including:
  - Adjunctive airways (OPA, NPA)
  - ET Tubes with stylet, syringe
  - Laryngoscope with blades and working light
  - McGill forceps
  - NG tube
  - Surgical Cric Kit
- Alternative airway (KING)
- Endotracheal tube introducer (Bougie)
- Pharmacological agents
- Adequate manpower
- Secure vascular access in place (IV/IO)
- Cardiac monitor with capnography and pulse ox monitoring

### MEDICATION ASSISTED AIRWAY PROCEDURE (CONTINUED)

#### **General Indications**

Pharmacological agents are used to assist the paramedic in performing intubation in patients who are difficult to intubate due to excessive gag reflex in instances for which protecting the airway is a potential life saving maneuver. Specific examples of circumstances in which such agents could be utilized are:

- Isolated head trauma
- CVA/Stroke
- Multisystem trauma
- Overdose
- Status epilepticus
- Acute Pulmonary Edema
- Respiratory Failure
- Severe burns
- Based on anticipated clinical course

The above indications are applicable when in those instances it is necessary to manage severe respiratory distress, optimize airway protection, hyperventilate for central nervous system lesions, or to provide ventilatory assistance in the presence of hypoxia or when other means of doing so are ineffective or contraindicated.

#### **Contraindications**

- Inability to ventilate patient with BVM secondary to:
  - Upper airway obstruction
  - Tracheal obstruction (foreign body, tumor)
- Suspected pharyngeal infection (epiglottitis, peritonsillar or retropharyngeal abscess)

MEDICATION ASSISTED AIRWAY PROCEDURE (CONTINUED)

**Medication Assisted Intubation (MAI) Procedure**

Assess the patient for likelihood of successful intubation and need for definitive airway, and the feasibility of alternate methods:

- Nasal intubation
- KING Airway
- Bag-valve-mask
- Surgical Cric
- Ensure adequate oxygenation while preparing the equipment
- Prepare equipment and medications
- Pre-oxygenate using high flow oxygen, assisting ventilation as needed
- Administer Etomidate 0.3mg/kg IV or Midazolam 2.5-5mg IV
- For pain relief or attenuation of increased ICP may use
  - Fentanyl 1.0-2.0mcg/kg over at least two minutes (to max single dose of 100mcg) q5minutes
- As patient relaxes (jaw relaxes, ease of bag-valve-mask ventilations)
  - Proceed with intubation
  - Consider cricoid pressure (if patient vomits, release cricoid pressure and suction as needed)
  - Each intubation attempt should not exceed 20 seconds
  - For failed attempts, re-oxygenate for 30-60 seconds
- If inadequate relaxation is present
  - Administer second dose of etomidate (0.3 mg/kg) or,
  - Administer initial or second dose of midazolam (2.5-5 mg)

### MEDICATION ASSISTED AIRWAY PROCEDURE (CONTINUED)

#### **If unable to intubate**

- Ventilate patient with BVM until medication effects abate
- Consider cricoid pressure to minimize gastric distention
- Consider placement of NG tube to decompress gastric contents
- Consider naloxone for reversal of opiate induction agent

#### **Once intubated**

- Assure patency and placement of endotracheal tube by the following confirmation methods:
  - Bilateral lung sounds
  - Negative epigastric sounds
  - ETCO<sub>2</sub> waveform and CO<sub>2</sub> value
  - Direct laryngoscopy or visualization of the chords
- Suction, adjust tube, or re-intubate as needed. Assure that tube is secured in place and cuff is functioning correctly.
- Use Pain/Sedation Management protocol post intubation
- Reconfirm tube after each patient position change
- Continuously monitor HR and SpO<sub>2</sub>
- Consider placement of NG tube to decompress gastric contents
- Restraints should be considered for the patient to prevent any dislodgement of the tube caused by breakthrough combativeness
- Even in non traumatic patients the use of a C-collar has been shown to reduce tube movement and should be considered.
- Capnography monitoring is mandatory. Ventilate patient to ETCO<sub>2</sub> of 35-45, and 30-35 for obvious head injury with suspected increased ICP

## **NASOTRACHAEL INTUBATION**

- Nasotracheal intubation is the technique of passing an endotracheal tube through the nose and pharynx into the trachea. This is done without using a laryngoscope to visualize the vocal cords (blind technique).
- This procedure may be attempted in any breathing patient with a need to secure a functioning respiratory system or with inadequate respirations or in whom attempts at oral intubation are unsuccessful. Signs indicating a potential need for intubation include: an oxygen saturation of less than or equal to 85% in a patient on 100% oxygen by face mask and respiratory distress; a respiratory rate of 8 or less or 44 or greater per minute; a Glasgow Coma Score of 8 or less; or loss of the gag reflex.
- Nasotracheal intubation **SHOULD NOT** be attempted in any patient with suspected narcotic overdose / hypoglycemia prior to administration of Narcan / Dextrose 50%, suspected basilar skull fracture, nasal and midface fractures, evidence of tracheal or laryngeal injury, coumadin anticoagulation therapy or hemostatic disorders.
- Oxymetazoline (Afrin) should be used to facilitate the procedure and reduce the discomfort for the patient.
- Nasotracheal intubation should not be attempted in children
- Use caution when intubating any patient with a suspected tracheal or laryngeal injury.
- All intubations must be verified with Capnography.
- All intubation attempts **MUST** be documented on the Prehospital Care Record.

## NEEDLE CRICOTHYROTOMY

- Stabilize the patient's head in the neutral position.
- Identify the cricothyroid membrane and prepare the skin.
- Stabilize the cricoid and thyroid cartilages with the nondominant hand.
- Once the cricothyroid membrane has been identified, insert a 14 gauge over-the-needle catheter attached to a 10 cc syringe or commercial cricothyrotomy device just below the midpoint of the cricothyroid membrane with the needle angled 45 degrees caudally.
- Aspirate while advancing the device until free air is encountered
- Withdraw the needle carefully while advancing the plastic catheter caudally into the trachea.
- Secure the catheter or device.
- Attach the hub of the catheter or commercial device to a BVM or jet insufflator and ventilate.

## **OROTRACHEAL INTUBATION**

Orotracheal intubation is the technique of passing an endotracheal tube into the trachea with direct visualization or digital manipulation.

This procedure may be attempted in any patient with a need to secure a functioning respiratory system or with inadequate respirations AND IN WHOM ATTEMPTS AT BASIC AIRWAY AND VENTILATORY SUPPORT ARE UNSUCCESSFUL. Signs indicating a potential need for intubation include: an oxygen saturation of less than or equal to 85% in a patient on 100% oxygen by face mask and respiratory distress; a respiratory rate of 8 or less or 44 or greater per minute; a Glasgow Coma Score of 8 or less; or loss of the gag reflex.

- Orotracheal intubation SHOULD NOT be attempted in any patient suspected of a narcotic overdose / hypoglycemia prior to administration of Narcan / Glucose 50%.
- Use caution when intubating any patient with a suspected tracheal or laryngeal injury.
- All intubations must be verified with Capnography.
- All intubation attempts MUST be documented on the Prehospital Care Record.

## **SURGICAL CRICOTHYROTOMY**

### **Indications:**

- Inability intubate, inability to insert BAID, inability maintain adequate oxygenation with BVM.

### **Contraindications:**

- Pediatric – sized airway

### **Equipment:**

- Scalpel with #11 blade
- Trousseau dilator (trach spreaders)
- Tracheal hook
- #6 Endotracheal tube
- Tape or ties to secure tube
- Bag-valve and oxygen source
- Suction
- Gauze 4 x 4s

### **Technique:**

- Position head in straight alignment with body, slightly extended, if possible.
- Locate cricothyroid cartilage about 1 finger widths below laryngeal prominence (thyroid cartilage)
- Prepare skin with betadine and alcohol
- Immobilize the larynx by placing the thumb and long finger on either side of the thyroid cartilage, placing the index finger on the cricothyroid notch
- Make a midline incision over the cricothyroid membrane, about 2 cm long, carefully going through skin, subcutaneous tissue, and anterior cervical fascia, but not through any cartilage. Assistant uses gauze to control bleeding.
- Palpate with index finger through incision to identify the cricothyroid membrane
- Make a horizontal incision about 1 cm long into the cricothyroid membrane.
  - ⌘ Hold the scalpel in the incision.

## SURGICAL CRICOTHYROTOMY (CONTINUED)

- Assistant inserts tracheal hook from above into the trachea through the incision in the cricothyroid membrane and gently pulls toward head to open incision
- Insert Trousseau dilator and squeeze together so that incision is opened from above and below (not side to side)
- Insert #6 ET tube until cuff is just inside trachea.
- Inflate cuff of ET tube and check tube placement per airway protocol.
- Secure ET tube with tape or trache ties, ensuring that it is not so tight that venous return from head is impeded
- You may shorten ET tube (be careful not to go below balloon port)

### **Assessment and care:**

- Check for tube placement, ventilation, and oxygenation in usual fashion. Watch for and control bleeding at surgical site.

### **CPAP**

Continuous Positive Airway Pressure has been shown to rapidly improve vital signs, gas exchange, reduce the work of breathing, decrease the sense of dyspnea, and decrease the need for intubation and ventilation in patients who suffer from shortness of breath.

#### **INDICATIONS**

Any patient who is in respiratory distress with signs and symptoms consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia and who is

- awake and able to follow commands
- is over 12 years old and is able to fit the CPAP mask
- has the ability to maintain an open airway

And exhibits any of the following;

- respiratory rate greater than 25 breaths per minute
- SPO2 of less than 94% at any time
- accessory muscle usage

#### **CONTRAINDICATIONS**

- Patient is in respiratory arrest or agonal breathing
- Patient is suspected of having a pneumothorax or has suffered trauma to the chest
- Patient has a tracheostomy
- Patient is actively vomiting or has upper GI bleeding

#### **PROCEDURE**

- Explain the procedure to the patient
- Ensure adequate oxygen supply to ventilation device
- Place the patient on continuous pulse oximetry
- Place the patient on cardiac monitor and record rhythm strips with vital signs
- Monitor the patients status with Capnography
- Place the delivery device over the mouth and nose
- Secure the mask with provided straps or other provided devices

### CPAP (CONTINUED)

- Use 10 cm H<sub>2</sub>O of PEEP valve
- Check for air leaks
- Monitor and document the patient's respiratory response to treatment
- Check and document vital signs every 5 minutes.
- Administer appropriate medication as indicated (continuous nebulized Albuterol for COPD/Asthma and repeated administration of nitroglycerin spray for CHF)
- Continue to coach patient to keep mask in place and readjust as needed
- If respiratory status deteriorates, remove device and consider intermittent positive pressure ventilation via BVM and/or placement of non-visualized airway or endotracheal intubation.

#### **REMOVAL PROCEDURE**

- CPAP therapy needs to be continuous and should not be removed unless the patient can not tolerate the mask or experiences respiratory arrest or begins to vomit.
- Intermittent positive pressure ventilation with a Bag-Valve-Mask, placement of a non-visualized airway and/or endotracheal intubation should be considered if the patient is removed from CPAP therapy.

#### **SPECIAL NOTES**

- Watch patient for gastric distention, which can result in vomiting.
- Procedure may be performed on patient with Do Not Resuscitate Order.
- Due to changes in preload and afterload of the heart during CPAP therapy, a complete set of vital signs must be obtained every 5 minutes.

### DEFIBRILLATION

Defibrillation involves the delivery of non-synchronized direct electric current to the myocardium of a patient exhibiting ventricular fibrillation or ventricular tachycardia without palpable pulses/blood pressure. The objective of defibrillation is to depolarize the entire myocardium, which, it is hoped, will result in allowing a single reliable pacemaker site to assume pacemaker control at a rate capable of producing an adequate cardiac output.

- Indications for defibrillation include patients with:
  - ✕ Ventricular fibrillation
  - ✕ Pulseless Ventricular tachycardia
  - ✕ Ventricular tachycardia who have inadequate perfusion, and for whom effective and rapid synchronized cardioversion is impossible.
- The patient **MUST** be on a cardiac monitor and **SHOULD** have Vascular Access
- When using a biphasic device, the initial attempt should be at 120 joules and subsequent attempts shall be at 200 joules.
- Initial attempt at pediatric defibrillation shall be at 2 joules/kg. If unsuccessful, defibrillation should be attempted at 4 joules/kg and continue at 4 joules per kg until conversion occurs. Adult paddles / pads may be used in children weighing more than 15 kg.
- Patients with automatic implantable cardioverter-defibrillators (AICD) will need external defibrillation if the AICD is ineffective.
- If defibrillation is needed on a patient with a permanent implanted pacemaker, the defibrillator paddles or self adhesive electrodes should be placed at least 5 inches from the pulse generator of the pacemaker.
- If conversion occurs and then the patient refribrillates, patient should be defibrillated at the same joule setting of the last shock.

## NEEDLE THORACENTESIS

- Expose and cleanse anterior chest at level of the 2nd intercostal space on the affected side.
- Find 2nd intercostal space midclavicular line with gloved finger (alternate location is the 4 — 5 intercostal space in the mid-axillary line).
- Insert a 14 gauge over-the needle catheter attached to a 10 cc syringe just over the third rib into the 2nd intercostal space maintaining the needle perpendicular (90 degrees) to the chest.
- Aspirate while advancing the device until free air is encountered.
- Withdraw the needle carefully while advancing the plastic catheter into the pleural space.
- Secure the catheter with tape.
- Assess patient for improvement in status.

## NASOGASTRIC – OROGASTRIC TUBE INSERTION

- Measure the tube to determine how far to insert it. Place the tip of the tube on the patient's nose, then extend the tube to the tip of the ear lobe and then to the end of the xyphoid process.
- Curve the end of the tube by coiling the first 6 inches tightly around your finger.
- Lubricate tip with water or KY jelly.
- Tilt the patient's head forward. Pass tube through nose downward but do not force. If severe resistance is met, remove the tube, lubricate and try the other nostril.
- When inserted approximately 4-5 inches, have the awake patient swallow water from a straw. If patient can't drink fluids, have the patient dry swallow or suck air through a straw. Advance the tube with each swallow. Stop tube insertion for respiratory distress.
- When the tube is inserted in the approximate length you have measured, check for placement in the stomach:
  - ✧ Check mouth and throat to ensure tube is not coiled in the back of the throat.
  - ✧ Auscultate the stomach while injecting 10-20 cc of air through the tube.
- Connect tube to suction. Use lowest possible setting which is effective.
- Anchor tube to the patient's nose with tape that has been wrapped around the tube. Do not allow any pressure to be placed on the patient's nares.
- Orogastric tubes should be used on infants less than 6 months of age because of their tendency to be obligate nose breathers.

## SYNCHRONIZED CARDIOVERSION

Synchronized cardioversion involves the delivery of an electric current to the myocardium of a patient who is exhibiting supraventricular or ventricular tachydysrhythmias that results in hemodynamic compromise. Cardioversion is appropriate in the field only in those patients where there is hemodynamic compromise or where it is evident that the patient's condition may further deteriorate.

- Indications for synchronized cardioversion include patients with:
- Ventricular tachycardia with inadequate perfusion
- Supraventricular tachycardia with inadequate perfusion
- Ventricular tachycardia with adequate perfusion, but refractory to drug therapy.
- The patient **MUST** be on a cardiac monitor and **SHOULD** have Vascular Access
- Consider sedation prior to cardioversion.
- When using a biphasic device, the initial and subsequent attempts shall be at the energy level(s) provided by the device.
- Pediatric cardioversion should begin at 0.5 to 1 J/kg and may increase to 2 J/kg if the initial dose is unsuccessful Consider sedation prior to cardioversion, administer Versed 0.1 mg/kg IVP, titrate to effect. Maximum single dose: 5 mg.

## TRANSCUTANEOUS PACING

- Transcutaneous pacing is the application of externally applied electrodes to deliver an adjustable electrical impulse directly across an intact chest wall for the purpose of rhythmically stimulating the myocardium to increase the mechanical heart rate.
- After attaching the electrodes, begin pacing at 70-80 beats per minute and the minimum available current.
- Increase current in 20 milliamp increments until electrical capture occurs.
- Confirm Mechanical Capture and once confirmed, increase ma by 10%.
- In the event of electrical capture and no pulses, leave pacing pads on, pacer turned on, and continue CPR.
- In the conscious patient with systolic BP >90, consider the Pain Sedation Protocol.

## VAGAL MANEUVERS

- Vagal maneuvers involve the application of a stimulus to the vagus nerve to increase parasympathetic tone. They are most commonly used as a first line treatment for Supraventricular Tachycardia in a symptomatic patient with adequate perfusion.
- The patient **MUST** be attached to a cardiac monitor and must have Vascular Access
- Approved methods include:
  - ✘ Valsalva maneuver (Bearing Down or Blowing against resistance)
  - ✘ Head-down tilt with deep inspiration
  - ✘ Carotid massage (only on patients under 40 years of age).
    - Potential complications include possible ventricular asystole and bradycardias.

## VASCULAR ACCESS

Vascular access should be obtained whenever there is a potential need for intravenous drug administration or when there is a need to administer IV fluids for volume expansion.

### Peripheral Vascular Access

- ⌘ The EMS provider should select a vein of sufficient caliber and location to maximize success. If possible, avoid veins proximate to arterial pulsations, veins in or near an injury (except burns) and veins over joints (stabilize appropriately, if used). Veins in the lower extremities should be used only after all other IV attempts have been unsuccessful and when an IV line is essential to patient care.
- ⌘ The external jugular site should be used only after other peripheral IV attempts have been unsuccessful and when an IV line is essential to patient care. (The external jugular site may be used INITIALLY if the patient has a critical need for IV therapy.
- ⌘ **DO NOT** start IV'S distal to a fracture site or into a surgical anastomosis, except in the critically unstable patient.
- ⌘ Saline locks may be used when appropriate and flushed with a 3 cc bolus of normal saline, as needed.
- ⌘ Extension tubing should be utilized on ALL IV lines.

## VASCULAR ACCESS (CONTINUED)

### **Intraosseous Access - EZ-IO Drill**

#### **Indications**

- For Adult or Pediatric Patients
- For infusing Intravenous fluids or medications in patients who exhibit 1 or more of the following:
  - ✕ An altered mental status (GCS of 8 or less).
  - ✕ Hemodynamic instability (Systolic BP of < 90).
- EZ-IO may be considered PRIOR to peripheral IV attempts in the following situations:
  - ✕ Cardiac arrest (medical or traumatic).
  - ✕ Profound hypovolemia with alteration of mental status.

#### **Contraindications:**

- Fracture of the tibia or femur (consider alternate tibia).
- Previous orthopedic procedures (IO within 24 hours, knee replacement; consider alternate tibia).
- Pre-Existing Medical Condition (tumor near site or peripheral vascular disease).
- Infection at insertion site (consider alternate site).
- Inability to locate landmarks (significant edema).
- Excessive tissue at insertion site.

#### **Equipment:**

- EZ-IO Driver
- EZ-IO Needle Set
- Alcohol or Betadine Swab
- IV or Extension Set
- 10 ml Syringe
- Tape or Gauze
- Pressure Bag

### VASCULAR ACCESS (CONTINUED)

#### **Flow rates:**

- Due to the anatomy of the IO space you will note flow rates might be slower than those achieved with IV catheters.
- Ensure the administration of a 10 ml rapid bolus (flush) with a syringe.
- Use a pressure bag or pump for continuous infusions.

#### **Pain:**

- Insertion of the EZ-IO in conscious patients causes mild to moderate discomfort and is usually no more painful than a large bore IV.
- You may consider local infiltration of 1% Lidocaine as IO Infusion can cause discomfort for conscious patients.

#### **Procedure:**

- If the patient is conscious, advise them of the EMERGENT NEED for this procedure and obtain informed consent.
- Wear approved Body Substance Isolation Equipment.
- Determine EZ-IO Indications.
- Rule out Contraindications.
- Locate insertion site (proximal tibia)
- Cleanse insertion site using aseptic technique.
- For conscious patients, you may consider local anesthetic (1% Lidocaine) at insertion site.
- Prepare the EZ-IO driver and needle set.
- Stabilize leg and insert EZ-IO needle set.
- Remove EZ-IO driver from needle set while stabilizing catheter hub.
- Remove stylet from needle set, secure stylet.
- Confirm placement.
- Connect primed EZ-Connect.
- Flush or bolus the EZ-IO catheter rapidly with 10 ml of normal saline using a 10 ml syringe .

## VASCULAR ACCESS (CONTINUED)

- Place a pressure bag or infusion pump on solution being infused where applicable.
- Begin infusion.
- Dress site, secure tubing and apply wristband.
- Monitor EZ-IO site and patient condition.

### **Previously established Central Line Access (ALS Only) - PICC Line (Peripherally Inserted Central Catheter)**

- PICC lines may be accessed when there is a need for drug or fluid resuscitation of a critically ill or injured patient, and in whom a peripheral line cannot be established.
- Prepare an IV set up with 1000 ml N.S. which will be attached to the cap at the distal end of the catheter.
- NOTE: All medications will be administered through the IV ports on the IV tubing.
  - ✘ If there is a cap with a needleless port on the distal end of the catheter, perform the following procedure.
    - ✘ Aggressively cleanse the port with an alcohol pad.
    - ✘ Attach a 10 ml syringe (without saline) to the port and attempt to aspirate about 5 ml of blood. Blood should aspirate freely. If it does not, remove the syringe and DO NOT use the catheter for access. DO NOT attempt to flush catheter at any time.
    - ✘ If blood is aspirated freely, remove the 10 ml syringe and attach the end of the IV tubing and begin IV infusion of normal saline. Adjust rate according to condition and needs of the patient.
    - ✘ If the cap on the distal end of the catheter has the needle-type port, perform the following procedure.
      - Aggressively cleanse the cap with an alcohol pad.
      - Clamp the catheter tubing (using only the existing clamp on the catheter), and then remove the cap. NOTE: A central line should never be open to air.

## NLTFPD EMS Protocols

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- Place the 10 ml syringe to the catheter end.
- Unclamp the catheter and attempt to aspirate about 5 ml of blood. Blood should aspirate freely. If it does not, clamp the tube again, remove the syringe and attach a sterile cap to the end of the catheter and finally unclamp the catheter. DO NOT use the catheter for access. DO NOT attempt to flush catheter at any time.
- If blood is aspirated freely, clamp the catheter again.
- Remove the 10 ml syringe and attach the end of the IV tubing to the catheter.
- Unclamp the catheter and begin IV infusion of normal saline. Adjust rate according to condition and needs of the patient.
- The rate for IV infusion using a central line needs to be closely monitored. Make sure all connections are secured.
- Central Line Access (Implantable Ports, Port-A-Caths, Mediports) may only be used if the device has already been accessed and IV fluid set-up has been established and is running. If an IV has been established, all medications should be administered through ports on the IV tubing.



***Some of these devices require special needles (non-coring type) for access. The device may be irreparably damaged if standard jumper (conventional) needles are used to access the ports.***

# MEDICATION FORMULARY

**APPROVED MEDICATIONS AND ROUTES**

**EMT-BASIC**

- Oxygen Inhaled
- Assist with Nitroglycerine SL
- Assist with Epi-Pen IM Auto-Inject
- Dextrose 40% Gel Bucal, Oral

**EMT-INTERMEDIATE** (In addition to EMT-Basic medications)

- Activated Charcoal PO
- Aspirin PO
- Dextrose 50%, 25%, 10% IV, IO
- Naloxone SQ, IM, IV, IO, ET, Intranasal
- Thiamine IM, IV, IO
- Nitrous Oxide Inhaled
- Proparacaine Drops
- Tylenol PO, PR
- Influenza and Pneumonia Vaccine IM

**EMT-INTERMEDIATE – PA** (May assist Paramedic with administration)

- Albuterol Inhaled, Nebulized
- Atropine IV, IO, ET, Auto-Inject
- Epinephrine - Bolus SQ, IM, IV, IO, ET
- Amiodarone – Bolus IV, IO
- Ipratropium Inhaled, Nebulized

**PARAMEDIC** (In addition to EMT-Basic and Intermediate Medications)

- Adenosine IV, IO
- Albuterol Inhaled, Nebulized
- Amiodarone – Bolus IV, IO
- Amiodarone - Infusion IV, IO
- Antibiotic Infusion Maintenance IV, IO
- Atropine IV, IO, ET, Auto-Inject
- Calcium Chloride IV, IO
- Diphenhydramine IM, IV, IO
- Dopamine Infusion IV, IO
- Epinephrine - Bolus SQ, IM, IV, IO, ET

APPROVED MEDICATIONS AND ROUTES (CONTINUED)

**PARAMEDIC** (In addition to EMT-Basic and Intermediate Medications)

· Epinephrine - Infusion	SQ, IM, IV, IO, ET
· Etomidate	IV
· Fentanyl	IM, IV, IO, Intranasal
· Flumazenil	IV, IO
· Furosemide	IV, IO
· Glucagon	IM
· Haloperidol	IM, IV, IO
· Heparin Infusion Maintenance	IV, IO
· Hydrocortisone Sodium Succinate	IV, IO, IM
· Ipratropium	Inhaled, Nebulized
· Lidocaine 1%	Intradermal, SQ
· Lidocaine 2% - Bolus and Infusion	IV, IO, ET
· Lidocaine 2% - Infusion	IV, IO
· Lidocaine 2% - Gel	Transdermal, Intranasal
· Magnesium sulfate – Bolus	IV, IO
· Magnesium sulfate – Infusion	IV, IO
· Midazolam	IM, IV, IO, Intranasal
· Morphine Sulfate	IM, IV, IO
· Nitroglycerine – Spray	SL
· Nitroglycerine - Paste	Transdermal
· Nitroglycerine Infusion Maintenance	IV, IO
· Ondansetron	IV, IO
· Oxymetazoline Hydrochloride	Intranasal
· Oxytocin Infusion	IV, IO
· Potassium Infusion Maintenance <40mEq	IV, IO
· Labetolol	IV, IO
· Sodium Bicarbonate	IV, IO

## **ACETAMINOPHEN (TYLENOL)**

### **Pharmacology and Actions**

Exact actions unknown. Thought to produce analgesia by blocking generation of pain impulses, probably by inhibiting prostaglandin synthesis in the CNS or the synthesis or action of other substances that sensitize pain receptors to mechanical or chemical stimulation. It is thought to relieve fever by central action in the hypothalamic heat-regulating center.

### **Indications**

Fever

### **Contraindications and Precautions**

Contraindicated in patients with hypersensitivity to acetaminophen. Avoid concomitant use with ethanol as this increases the risk of hepatic damage.

### **Side Effects and Special Notes**

1. Use cautiously in patients with suspected pre-existing liver disease, chronic alcohol use, or chronic hepatitis/jaundice because hepatotoxicity has occurred after therapeutic doses.
2. Many OTC products contain acetaminophen, be aware of this when calculating dosages.
3. Acetaminophen may produce false positive decreases in blood glucose levels in home monitoring systems.

## **ACTIVATED CHARCOAL**

### **Pharmacology and Actions**

An adsorbent that adheres to many drugs and chemicals, inhibiting their absorption from the GI tract.

### **Indications**

Poisoning

### **Contraindications and Precautions**

None known

### **Side Effects and Special Notes**

1. Although there are no contraindications, it is not effective in the treatment of all acute poisonings.
2. Give after emesis or lavage is complete.
3. If patient vomits shortly after administration, be prepared to repeat dose.
4. Follow treatment with laxative to prevent constipation and fecal impaction unless sorbitol is part of product ingredients.
5. Do not use charcoal with sorbitol in fructose intolerant patients or in children under 1 year.
6. Ineffective for poisoning or overdose of cyanide, mineral acids, caustic alkalis, and organic solvents. Not very effective with ethanol, lithium, methanol, and iron salts.
7. Assure patient has an intact gag reflex or airway is secured with an ET tube.

## **ADENOSINE (ADENOCARD)**

### **Pharmacology and actions**

1. Naturally-occurring amino acid
2. Slows conduction through the AV node
3. Has no effect on accessory tracks such as found in WPW or LGL syndromes
4. Extremely short duration of action (< 10 seconds)
5. May cause brief period of asystole which spontaneously reverts
6. Almost all patients will report varying degrees of chest pressure or pain after administration of this drug
7. Many patients will revert to the previous rhythm even after conversion to normal sinus rhythm

### **Indications**

Paroxysmal supraventricular tachycardia

### **Contraindications and precautions**

1. Second or third degree heart block
2. Atrial fibrillation, atrial flutter will not be converted by adenosine
3. Should not be given through a central line

**ALBUTEROL**  
(PROVENTIL, VENTOLIN)

**Pharmacology and Actions**

Albuterol relaxes bronchial smooth muscle by stimulating Beta 2 adrenergic receptors.

**Indications**

Albuterol is primarily used to treat bronchial asthma, COPD and reversible bronchospasm.

**Contraindications and Precautions**

Causes decrease in serum potassium and should be used with caution in patients with profound hypokalemia.

**Side Effects and Special Notes**

Adverse effects of albuterol include tremor, nervousness, tachycardia, palpitations and occasionally hypertension. Most patients will have a decrease in heart rate and blood pressure with relief of bronchospasm. Therefore, do not withhold therapy in patients with hypertension and/or tachycardia.

**AMIODARONE**  
(Cordarone)

**Pharmacology and Actions**

Considered a Class III antiarrhythmic. Possesses Calcium, Potassium and Sodium channel blocking properties. Thought to prolong the refractory period and action potential duration. Amiodarone has an extremely long half-life (up to 40 days)

**Indications**

Indicated for the treatment of shock refractory VF/pulseless VT

**Contraindications**

1. None in VF/Pulseless VT
2. Endotracheal administration is contraindicated

**Precautions**

May produce vasodilation and hypotension. May also have negative inotropic effects. May produce prolonged QT interval. Use with caution in the presence of renal failure.

## **ASPIRIN**

### **Pharmacology and Actions**

Inhibits platelet aggregation and thereby reduces thrombus formation.

### **Indications**

Acute chest pain related to myocardial ischemia

### **Contraindications and precautions**

1. History of GI bleed
2. Concurrent GI bleeding or multi-system trauma
3. Allergy to aspirin
4. Should not be given if patient has taken aspirin within last 4 hours

## **ATROPINE**

### **Pharmacology and Actions**

Atropine is an anticholinergic, inhibits acetylcholine at the parasympathetic neuroeffector junction, blocking vagal effects on the SA node; thus enhancing conduction to the AV node and increasing the heart rate.

### **Indications**

Atropine is indicated for symptomatic bradycardia and bradyarrhythmias (junctional or escape rhythm). It is also indicated in cases of organophosphate poisoning. It can be administered prior to endotracheal intubation to diminish secretions and block cardiac vagal reflexes. Excellent for vagally induced bradycardia in pediatric patient being intubated. Is also used to reverse bronchospasm when added to a nebulizer treatment.

### **Side Effects**

1. The most common side effect of atropine is a dry mouth.
2. The drug may be administered via an endotracheal tube if IV access is not established.
3. The action of atropine cause mydriasis (dilated pupils).

## **CALCIUM CHLORIDE**

### **Pharmacology and actions**

Positive inotrope which increases contractility (the strength of the contraction). Stabilizes myocardial muscle membrane in the setting of hyperkalemia.

### **Indications**

1. Hyperkalemic cardiac arrest
2. Life-threatening hyperkalemia
3. Calcium channel blocker overdose
4. MgSO<sub>4</sub> overdose

### **Contraindications**

1. Hyperkalemia due to digitalis toxicity
2. Known hypercalcemia

## **DEXTROSE 50%, 25%, 10%**

### **Pharmacology and Actions**

Dextrose is a sugar called glucose or grape sugar containing six carbon atoms. Dextrose is important because it is the primary energy source for the brain.

### **Indications**

Dextrose is indicated for the treatment of known hypoglycemia.

### **Contraindications and Precautions**

Contraindicated in intracranial or intraspinal hemorrhage.

### **Side Effects and Special Notes**

1. Dextrose is extremely hypertonic. It should be administered into a rapid-running IV established in a large vein. Inadvertent extravasation will lead to tissue sloughing and necrosis.

**DIPHENHYDRAMINE HYDROCHLORIDE  
(BENADRYL)**

**Pharmacology and Actions**

Diphenhydramine competes with histamine for H1 receptor sites on effector cells. Prevents but does not reverse histamine-mediated responses, particularly histamine's effects on the smooth muscle of bronchial tubes, gastrointestinal tract, uterus and blood vessels.

**Indications**

Diphenhydramine is one of the most widely used antihistamines for the treatment of anaphylaxis and severe allergic reactions. It has also been used to treat motion sickness and extrapyramidal symptoms.

**Contraindications and Precautions**

Diphenhydramine is contraindicated in acute asthmatic attack. It should be used cautiously in glaucoma and in asthmatic, hypertensive or cardiac patients.

**Side Effects and Special Notes**

1. Adverse reactions include drowsiness, occasional nausea and dry mouth.
2. Used with epinephrine in severe anaphylaxis (if not contraindicated).

## **DOPAMINE HYDROCHLORIDE (INTROPIN)**

### **Pharmacology and Actions**

Dopamine is the endogenous catecholamine precursor of norepinephrine. It releases norepinephrine and displays direct and indirect alpha and beta 1 effects. It increases cardiac output and usually elevates heart rate and systolic pressure - systemic vascular resistance is not increased except at higher dosages. It dilates renal and splenic vascular beds by activation of dopaminergic receptors. The alpha effects predominate at higher doses (usually greater than 10mcg/kg per minute, marked individual variation exists and dose must be guided by clinical response).

### **Indications**

Dopamine is indicated for augmentation of cardiac performance and/or renal blood flow in shock and hypoperfusion syndromes due to septicemia, cardiac failure, cardiac surgery, renal failure, trauma and acute myocardial infarction.

### **Contraindications and Precautions**

Dopamine is contraindicated in patients with uncorrected tachyarrhythmias, ventricular fibrillation or known hypersensitivity. It should be used cautiously in patients with peripheral vascular disease. Any underlying hypovolemia must be corrected, if possible, prior to use.

### **Side Effects and Special Notes**

1. The infusion site should be monitored closely for skin sloughing and necrosis.
2. The principal adverse effects include headache, anxiety, tachycardia, chest pain, hypotension, nausea and vomiting.
3. Carefully monitor blood pressure, ECG and urine output throughout the infusion.
4. Extravasation requires discontinuation of the drug.

**DOPAMINE DRIP CHART**

Use this chart if you are using a Dopamine concentration of 1600 mcg/mL.  
Match the weight with the dose and set your dial a flow or pump.

Example: A patient who weighs 50 kg needs dopamine at 5 mcg/kg/min. You need to administer 9 mL/hr or 9 gtt/min using 60 gtt/mL set.

Weight (kg)	Dopamine dosage in mcg/kg/min					
	5	6	7	8	9	10
50	9	11	13	15	17	19
55	10	12	14	16	19	21
60	11	13	16	18	20	22
65	12	15	17	19	22	24
70	13	16	18	21	24	26
75	14	17	20	22	25	28
80	15	18	21	24	27	30
85	16	19	22	25	29	32
90	17	20	24	27	30	34
95	18	21	25	28	32	36
100	19	22	26	30	34	37
105	20	24	28	31	35	39
110	21	25	29	33	37	41
115	22	26	30	34	39	43
120	22	27	31	36	40	45
125	23	28	33	37	42	47
130	24	29	34	39	44	49

## EPINEPHRINE

### Pharmacology and Actions

Epinephrine is an endogenous catecholamine with both alpha and beta adrenergic activity. Epinephrine increases heart rate, myocardial contractility, pulse pressure, cardiac output, systolic and diastolic blood pressure, automaticity, systemic vascular resistance and myocardial work and oxygen consumption. Epinephrine also lowers the threshold for defibrillation and causes bronchodilation.

### Indications

Epinephrine is indicated in cardiac asystole, ventricular fibrillation, pulseless electrical activity, anaphylactic shock, bronchial asthma, croup and hypotension.

### Contraindications and Precautions

1. Age > 45, or previous cardiac history (in some settings consult medical control).
2. Epinephrine will lower the threshold for ventricular fibrillation. Epinephrine's positive inotropic and chronotropic effects can precipitate or exacerbate cardiac ischemia.

### Side Effects and Special Notes

1. Epinephrine should not be mixed in the same infusion bag with alkaline solutions or be given concurrently with sodium bicarbonate.
2. May be given via an endotracheal tube if IV access is not available.

**ETOMIDATE**  
(AMIDATE)

**Pharmacology and Actions**

Etomidate is an imidazole derivative that is primarily a hypnotic. It is the most hemodynamically stable of the currently available induction agents. At induction doses of 0.2 - 0.3 mg/kg IV it has minimal respiratory or myocardial depression. Etomidate attenuates the rise in intracranial pressure that is associated with laryngoscopy and intubation. It does this by decreasing cerebral blood flow and cerebral metabolic oxygen demand without adversely affecting cerebral perfusion pressure. In healthy, hemodynamically stable patients, the recommended induction dose of 0.3 mg/kg should be used. The onset is 20-30 seconds with full recovery in 7-14 minutes.

**Indications**

Medication assisted intubation.

**Contraindications and Precautions**

Know hypersensitivity to the drug.

ETOMIDATE  
(AMIDATE) CONTINUED

**Side Effects and Special Notes**

1. Etomidate does not release histamine, but it can cause nausea and vomiting, pain on injection, myoclonic movement, and hiccups.
2. A small number of patients will experience pain on injection of etomidate. This is due to the diluent (propylene glycol) and can be lessened considerably if administered in a large vein, and in conjunction with a rapid intravenous fluid rate.
3. The myoclonic activity following etomidate injection is secondary to brain stem stimulation and can be mistaken for grand mal seizures.
4. Hiccups are usually not a concern during RSI but should be recognized as a side effect of etomidate administration.
5. The best known and most concerning side effect of etomidate is its reversible blockade of 11 beta-hydroxylase which decreases both serum cortisol and aldosterone levels. This side effect is much more common with continuous infusions of etomidate in the intensive care unit setting rather than with a single dose injection utilized for RSI.

## FENTANYL

### Pharmacology and Actions

Binds with opiate receptors in the CNS, altering both perception of and emotional response to pain through an unknown mechanism.

### Indications

Fentanyl is indicated for the relief of severe acute and severe chronic pain.

### Contraindications and Precautions

1. Contraindicated in patients with known intolerance to the drug.
2. Additive effects with CNS depressants, general anesthetics, hypnotics, MAO inhibitors, other narcotic analgesics, sedatives, and tricyclic antidepressants. Fentanyl dose should be reduced by 1/4 to 1/3.

### Side Effects and Special Notes

1. For better analgesic effect administer drug before patient has intense pain.
2. Monitor respiratory status carefully, drug may cause respiratory depression. Naloxone may be used to reverse fentanyl.
3. Rapid administration may cause chest wall rigidity.

**FLUMAZENIL  
(ROMAZICON)**

**Pharmacology and Actions**

Benzodiazepine antagonist that competitively inhibits the actions of benzodiazepines on the gamma-aminobutyric acid-benzodiazepine receptor complex.

**Indications**

Complete or partial reversal of sedative effects after benzodiazepines after anesthesia or short diagnostic procedures (conscious sedation). Suspected benzodiazepine overdose.

**Contraindications and Precautions**

Contraindicated in patients hypersensitive to flumazenil or benzodiazepines; in patients who show evidence of serious tricyclic antidepressant overdose; and in those who received benzodiazepines to treat a potentially life-threatening condition (such as status epilepticus).

**Side Effects and Special Notes**

1. Use cautiously in patients at high risk for developing seizures; patients who have recently received multiple doses of a parenteral benzodiazepine; patients displaying some signs of seizure activity; patients who may be at risk for unrecognized benzodiazepine dependence; patients with head injury; psychiatric patients; and alcohol dependent patients.
2. Safety and efficacy in children has not been established.
3. Monitor patient closely for re sedation that may occur after reversal of benzodiazepine effects because flumazenil's duration of action is shorter than that of all benzodiazepines.

**FUROSEMIDE**  
(LASIX)

**Pharmacology and Actions**

Furosemide acts as a diuretic. The onset of diuresis following IV administration is within five minutes, with the peak effect occurring within the first half hour.

**Indications**

Furosemide is the indicated therapy in acute pulmonary edema.

**Contraindications and Precautions**

Furosemide is contraindicated in anuria and in patients with a known hypersensitivity to the drug. Excessive diuresis may result in dehydration and reduction in blood volume with circulatory collapse. Patients should be observed for signs of fluid and electrolyte imbalances; namely hyponatremia, hypochloremic alkalosis and hypokalemia.

**Side Effects and Special Notes**

Digitalis therapy may exaggerate metabolic effects of hypokalemia, especially with reference to myocardial activity.

## **GLUCAGON**

### **Pharmacology and Actions**

Raises blood glucose level by promoting catalytic depolymerization of hepatic glycogen to glucose.

### **Indications**

Hypoglycemia

### **Contraindications and Precautions**

Known hypersensitivity to the drug

### **Side Effects and Special Notes**

1. Use only the diluent supplied by the manufacturer.
2. Unstable hypoglycemic diabetic patients may not respond to glucagon, and will require IV dextrose.
3. As soon as patient is alert enough to swallow, follow up with a meal, orange juice, D50, etc.

**HALPERIDOL**  
(HALDOL)

**Pharmacology and Actions**

The precise mechanism of action has not been clearly established. A butyrophenone that probably exerts its antipsychotic effects by blocking postsynaptic dopamine receptors in the brain.

**Indications**

Management of psychotic disorders.

**Contraindications**

Known hypersensitivity to medication.  
Coma or CNS Depression.

**Adverse Reactions**

Extrapyramidal reactions, tardive dyskinesia, sedation, tachycardia, hypotension, and dry mouth.

## HEPARIN

### Pharmacology and Actions

Prevents conversion of fibrinogen to fibrin and prothrombin to thrombin by enhancing the inhibitory effects of antithrombin III.

### Indications

Deep vein thrombosis, pulmonary emboli, myocardial infarction, open heart surgery, disseminated intra vascular clotting syndrome (DIC), atrial fibrillation with embolization, prevention of DVT/P.E.

### Contraindications

Hypersensitivity, hemophilia, leukemia with bleeding, peptic ulcer disease, severe hepatic disease and severe HTN.

### Side Effects and Special Notes

1. Monitor for side effects of: bleeding gums, petechiae, ecchymosis, black tarry stools, hematuria, epistaxis and a decrease in blood pressure. The antidote for heparin overdose is Protamine.
2. Heparin may increase the action of diazepam.
3. Digitalis, tetracyclines and antihistamines; decrease the action of heparin.
4. Oral anticoagulants, salicylates, dextran, steroids and nonsteroidal anti-inflammatories: increase the action of heparin.

**HEPARIN WEIGHT ADJUSTED PROTOCOL**

The following chart gives the heparin infusion rate in both units/hr and ml/hr with a heparin concentration of **50 units/ml** (i.e., 25,000 units in 500ml).

Units/Hr	ML/Hr
600-----	12
700-----	14
800-----	16
900-----	18
1000-----	20
1100-----	22
1200-----	24
1300-----	26
1400-----	28
1500-----	30
1600-----	32
1700-----	34
1800-----	36
1900-----	38
2000-----	40
2100-----	42
2200-----	44
2300-----	46
2400-----	48
2500-----	50
2600-----	52
2700-----	54
2800-----	56
2900-----	58
3000-----	60

## **HYDROCORTISONE SODIUM SUCCINATE (SOLU-CORTEF)**

### **Pharmacology and Actions**

Is a systemic corticosteroid that inhibits multiple inflammatory processes. Solu-Cortef produces multiple glucocorticoid and mineralocorticoid effects. It has a half-life of 8-12 hours and is metabolized by the liver.

### **Indications**

1. Adrenal Insufficiency (Congenital Adrenal Hyperplasia)
2. Corticosteroid responsive conditions

### **Contraindications**

1. Systemic fungal infections
2. Premature infants and Neonates
3. Idiopathic thrombocytopenic purpura

### **Precautions**

1. Hyperglycemia
2. Hypersensitivity
3. Decreases immune function
4. Contains benzyl alcohol

### **Adverse Reactions/Side Effects**

1. Sodium Retention, CHF, edema,
2. Hyperglycemia
3. Hypertension
4. Hyperkalemia
5. N/V
6. Headache
7. Anaphylaxis

**IPRATROPIUM BROMIDE  
(ATROVENT)**

**Pharmacology and Actions**

Anticholinergic bronchodilator

**Indications**

1. For relief of acute bronchospasm (reversible airway obstruction)

**Contraindications**

1. Allergy or known hypersensitivity to Atrovent
2. Hypersensitivity to atropine (chemically related)
3. Those with a history of hypersensitivity to soyalecithin or related food products, such as soy beans and peanuts.

**Precautions**

1. Use with caution in patients with heart disease, hypertension, glaucoma and the elderly.
2. Ipratropium may worsen the condition of glaucoma if it gets into the eyes. Having the patient close their eyes during nebulization may prevent this.

**Adverse Reactions/Side Effects**

1. More common: cough, dry mouth or unpleasant taste
2. Less common or rare: vision changes, eye burning or pain, dizziness, headache, nausea, nervousness, palpitations, sweating, trembling, increased wheezing or dyspnea, chest tightness, rash, hives or facial swelling

**LABETALOL**  
(TRANDATE)

**Pharmacology and Actions**

Class: Beta-blocker. Selectively antagonizes alpha1-adrenergic receptors; antagonizes beta1- and beta2-adrenergic receptors (selective alpha and non-selective beta blocker). This results in decreased HR, electrical conduction, and contractility. It can also result in bronchoconstriction and peripheral vasoconstriction. Half-life 5-8 hours.

**Indications**

1. Hypertensive crisis.

**Contraindications: IV Labetalol**

1. hypersensitivity to drug/class/component.
2. sinus bradycardia (HR<60)
3. AV block, 2nd or 3rd degree
4. heart failure, uncompensated
5. cardiogenic shock
6. sick sinus syndrome w/o pacemaker
7. bronchial asthma

**Serious Reactions, IV Labetalol**

1. CHF
2. heart block
3. bradycardia, severe
4. hypotension
5. arrhythmia, ventricular (IV)
6. Raynaud's phenomenon
7. bronchospasm

**Common side effects:** dizziness, paresthesias, N/V, dyspnea

**LIDOCAINE**  
(XYLOCAINE)

**Pharmacology and Actions**

Lidocaine attenuates phase four diastolic depolarization and decreases automaticity. Raises the ventricular fibrillation threshold.

**Indications**

Indicated for the acute management of ventricular arrhythmias. Prophylactic use in the acute myocardial infarction remains a subject of debate. Prevents the increased intracranial pressure associated with rapid sequence intubation.

**Contraindications and Precautions**

Lidocaine should be used with caution in patients with severe heart block (may block the only pacemaker present).

**Side Effects and Special Notes**

1. Overdose of lidocaine usually results in signs of central nervous system or cardiovascular toxicity. Airway maintenance should be ensured in the event of seizures or signs of respiratory depression. Seizures may be treated with intravenous anticonvulsant agents such as diazepam. Should circulatory depression occur, vasopressors may be used. Clinical signs of CNS toxicity may include light-headedness, nervousness, apprehension, euphoria, confusion, dizziness, drowsiness, tinnitus, blurred or double vision, vomiting, sensations of heat, cold or numbness, twitching, tremors, convulsions, unconsciousness, respiratory depression and arrest.
2. Cardiovascular reactions are usually depressant in nature and are characterized by bradycardia, hypotension and cardiovascular collapse.
3. May be given via an endotracheal tube if IV access is not available.

## MAGNESIUM SULFATE

### Pharmacology and Actions

Magnesium sulfate acts as a smooth muscle relaxant, especially for uterine smooth muscle and a mild bronchodilator. Also acts as an antiarrhythmic agent which may be effective in decreasing arrhythmias related to acute myocardial infarction. Acts as a central nervous system depressant and may cause respiratory depression or apnea.

### Indications

Magnesium sulfate is indicated in pregnancy induced hypertensive disorders (preeclampsia or eclampsia) to prevent convulsions. It may transiently lower blood pressure at therapeutic levels. Magnesium sulfate can also be used as a tocolytic in pre-term labor. In medical patients magnesium sulfate may be used in irretractable ventricular tachycardia/fibrillation especially in torsades de pointes.

### Contraindications and Precautions

Use cautiously in patients with renal failure.

### Special Notes and Side Effects

1. Foley catheter: if less than 30cc/hr. minimum output, call physician; if no response in 30 minutes, discontinue infusion, attempt to reach medical control.
2. Monitor respiratory rate every 5 minutes. For respiratory depression, discontinue magnesium infusion and maintain airway/ventilation as needed.
3. Monitor blood pressure every 15 minutes.
4. Monitor reflexes every 30 minutes; if absent or hyper-reactive, after standard regimen, call physician.
5. 1-2 grams of calcium gluconate or 0.5-1 grams of calcium chloride given IV as a bolus is the physiologic antidote for magnesium sulfate toxicity.

**MIDAZOLAM**  
(VERSED)

**Pharmacology and Actions**

Versed is a short acting benzodiazepine with CNS depressant and antiseizure actions.

**Indications**

Agent for short periods of sedation and to reduce agitation .

**Contraindications and Precautions**

Use with caution in patients with respiratory compromise/distress or decreased mental status. Versed should not be used on patients with known hypersensitivity to benzodiazepine or patients with narrow angle glaucoma.

**Side Effects and Special Notes**

Constant monitoring of cardiopulmonary status of patient is required. Reduce dose up to 50% when used with other sedatives or analgesics and when used on elderly or debilitated patients. This drug is for short term sedation and is not the drug of choice when long term sedation is required.

## **MORPHINE SULFATE**

### **Pharmacology and Actions**

Morphine sulfate acts as a narcotic analgesic and produces central nervous system depression. It also manifests mild hemodynamic effects. It increases venous capacitance and systemic vascular resistance, relieving pulmonary congestion.

### **Indications**

Morphine is indicated for the relief of severe acute and severe chronic pain. Morphine may be used for ischemic chest pain unrelieved by nitrates. Morphine has a possible role in the treatment of pulmonary edema.

### **Contraindications and Precautions**

Use caution in the patient with respiratory insufficiency or depression.

### **Side Effects and Special Notes**

1. The most common side effects are respiratory depression and orthostatic hypotension (which can be corrected with IV fluids).
2. Monitor for respiratory depression, continuous pulse oximetry may aid in assessing respiratory depression.
3. Naloxone should be readily available for administration in the event of severe respiratory depression.

**NALOXONE**  
(NARCAN)

**Pharmacology and Actions**

Displaces previously administered narcotic analgesics from their receptors (competitive antagonism). Has no pharmacologic activity of its own.

**Indications**

Naloxone is indicated for known or suspected narcotic induced respiratory depression as well as coma of unknown etiology.

**Contraindications and Precautions**

May cause withdrawal symptoms in addicted individuals.

**Side Effects and Special Notes**

1. Administer slowly in an amount sufficient to reverse respiratory depression only. Given rapidly, a patient may awake suddenly and become extremely combative.
2. Drug may be administered via an endotracheal tube if IV access is not available.
3. The duration of the narcotic may exceed that of naloxone. Frequent re-administration may be necessary.

**NITROGLYCERIN**  
(NITROSTAT, TRIDIL)

**Pharmacology and Actions**

Relaxation of vascular smooth muscle is the principal action of nitroglycerin. Nitroglycerin produces, in a dose related manner, dilation of both the arterial and venous beds. Venous dilation promotes peripheral pooling of blood and decreases venous return to the heart, reducing left ventricular end-diastolic pressure (preload). Arteriolar relaxation reduces systemic vascular resistance and arterial pressure (afterload). Myocardial oxygen consumption is decreased. Elevated central venous and pulmonary capillary wedge pressures, pulmonary vascular resistance and systemic vascular resistance are also reduced.

**Indications**

Nitroglycerin is indicated for treatment and management of myocardial ischemia, malignant hypertension, and congestive heart failure.

**Contraindications and Precautions**

Nitroglycerin is contraindicated in patients with known hypersensitivity, hypotension, uncorrected hypovolemia, increased intracranial pressure, inadequate cerebral circulation, and pericardial tamponade. Nitroglycerin is contraindicated if Viagra has been used within the previous 24 hours.

Maintain a systolic B/P > 90mm/hg and limit blood pressure drop to 30% of pre-treatment blood pressure.

**NITROGLYCERINE DRIP CHART**

Amount to infuse in ml/hr		
Dose Ordered (mcg/min)	50 mg/250 ml	100 mg/250 ml
	100 mg/500ml (200 mcg/ml)	200 mg/500 ml (400 mcg/ml)
10	3	1.5
20	6	3
30	9	4.5
40	12	6
50	15	7.5
60	18	9
70	21	10.5
80	24	12
90	27	13.5
100	30	15
110	33	16.5
120	36	18
130	39	19.5
140	42	21
150	45	22.5
160	48	24
170	51	25.5
180	54	27
190	57	28.5
200	60	30

**Side Effects and Special Notes**

1. Headache is the most frequent adverse reaction.
2. If severe hypotension and reflex tachycardia occurs, decrease the nitroglycerin or temporarily discontinue it and place the patient in a supine position with legs elevated.
3. Sublingual nitroglycerin can be beneficial in the clinical diagnosis of cardiac disease. Sublingual nitroglycerin is the initial drug of choice in the patient with classic cardiac pain.
4. Intravenous nitroglycerin should be administered by an infusion pump.
5. Blood pressure should be taken and recorded every five minutes while titrating nitroglycerin, and then every 15 minutes while infusion continues. Monitor the ECG continuously.

## NITROUS OXIDE

A patient's self-administration of a nitrous oxide-oxygen mixture can provide relief of acute pain, provided there are no contraindications to its use.

### Indications

Broad, first-line for rapid pain relief

### Side-effects

Euphoria, disassociation

### Contraindications

1. Head injury with altered level of consciousness
2. Recent ingestion of alcohol or illicit drugs
3. Major facial injuries or trauma
4. Thoracic trauma
5. Known or suspected bowel obstruction
6. Known or suspected cardiac ischemic chest pain
7. Patient developing cyanosis or respiratory distress with use of nitrous oxide – oxygen
8. Inability to comply with instructions regarding use of nitrous oxide – oxygen
9. Pulse oximeter reading indicating oxygen saturation is less than 90% prior to nitrous oxide-oxygen mixture use

### Procedure

1. Perform patient assessment and record vital signs, level of consciousness, and oxygen saturation.
2. monitor oxygen saturation **at all times** until nitrous oxide-oxygen mixture is no longer used by the patient
3. Instruct the patient in the method of self-administration. The patient must self administer the nitrous oxide-oxygen mixture without assistance.
4. Monitor the patient closely for evidence of efficacy or adverse effects.
5. Repeat assessment, including vital signs, level of consciousness, oxygen saturation, and effect of nitrous oxide – oxygen.

**ONDANSETRON**  
(ZOFRAN)

**Pharmacology and Actions**

A selective antagonist of a specific type of serotonin receptor located in the CNS at the area postrema (chemoreceptor trigger zone) and in the peripheral nervous system on nerve terminals of the vagus nerve. The drug's blocking action may occur at both sites.

**Indications**

Prevention of nausea and vomiting.

**Contraindications and Precautions**

Known hypersensitivity to the medication.

**Side Effects and Special Notes**

1. Use cautiously in patients with liver failure.
2. IV use: administer over 2 to 5 minutes.

**OXYMETAZOLINE HYDROCHLORIDE**  
(AFRIN)

**Pharmacology and Actions**

Unknown. Thought to cause local vasoconstriction of dilated arterioles, reducing blood flow and nasal congestion.

**Indications**

Nasal congestion. Prior to nasal intubation to lessen the chance of causing an epistaxis.

**Contraindications and Precautions**

Known hypersensitivity to the drug. Use cautiously in patient with hyperthyroidism, cardiac disease, hypertension, or diabetes mellitus.

**Side Effects and Special Notes**

1. Bottle is single patient use only and needs to be replaced after each use.

**OXYTOCIN**  
(PITOCIN)

**Pharmacology and Actions**

Selectively stimulates the smooth musculature of the uterus resulting in increased uterine muscle tone, increased frequency of contractions and increased strength of contractions.

**Indications**

1. Normal postpartum - to produce uterine contractions after the deliver of the placenta.
2. Postpartum hemorrhage - to control excessive uterine bleeding when related to recent childbirth

**Contraindications and Precautions**

Contraindicated with known hypersensitivity to the drug and with retained placenta.

**Side Effects and Special Notes**

1. Side effects include: Cardiac dysrhythmia, pelvic hematoma, hypertonicity of the uterus, uterine rupture, nausea, vomiting, and fluid retention
2. Monitor vaginal drainage and uterine tonicity during administration

## POTASSIUM CHLORIDE

### Pharmacology and Actions

Potassium is a mineral that the human body requires for proper functioning of neuromuscular tissues.

### Indications

Potassium chloride is used for the treatment of hypokalemia.

### Contraindications and Precautions

Potassium chloride is contraindicated in severe renal impairment with oliguria and anuria. It is also contraindicated in hyperkalemia.

### Side Effects and Special Notes

1. Adverse reactions to potassium chloride administration include peripheral vascular collapse with hypotension, cardiac arrhythmias, heart block, possible cardiac arrest, EKG changes (prolonged P-R interval, wide QRS, ST segment depression, tall tinted T waves), nausea, vomiting, abdominal pain and pain at the infusion site.
2. Potassium chloride concentrations of greater than 40meq per liter should be administered via an infusion pump.
3. 1-3cc of 1% lidocaine may be added directly to the potassium chloride solution to decrease pain at the infusion site.
4. Patients receiving potassium chloride at rates greater than 20meq per hour should have continuous ECG monitoring.
5. Treat hyperkalemia: 1gm calcium chloride + 5 units regular insulin + 50gm glucose

**PROPARACAINE**  
(ALCAINE)

**Indications**

Provides anesthesia prior to ophthalmic procedures, such as irrigation.

**Contraindications and Precautions**

Known hypersensitivity.

**Side Effects and Special Notes**

1. Use cautiously in patients with cardiac disease and hyperthyroidism.
2. Not for long term use.
3. Warn patient not to rub or touch eye while it is anesthetized. This may cause corneal abrasion and greater pain when anesthesia wears off.
4. Do not use discolored solution.

## **SODIUM BICARBONATE**

### **Pharmacology and Actions**

Sodium bicarbonate reacts with hydrogen ions to form water and carbon dioxide to buffer metabolic acidosis.

### **Indications**

Sodium bicarbonate is indicated for the acidosis that accompanies shock and cardiac arrest. It is no longer recommended as a first line drug in cardiac arrest. It is also indicated in the treatment of tricyclic antidepressant overdose and life threatening hyperkalemia.

### **Contraindications and Precautions**

There are no contraindications to the use of sodium bicarbonate in life threatening emergencies, however its administration should be guided by blood gas analysis whenever possible.

### **Side Effects and Special Notes**

Sodium bicarbonate can inactivate the catecholamines norepinephrine, dopamine and epinephrine. Do not mix with IV solutions of these agents.

**THIAMINE**  
(VITAMIN B1)

**Pharmacology and Actions**

Combines with adenosine triphosphate to form a coenzyme necessary for carbohydrate metabolism.

**Indications**

Administered concurrently with D50 in intoxicated or malnourished patients to prevent Wernicke's encephalopathy.

**Contraindications and Precautions**

Known hypersensitivity to the drug.

**Side Effects and Special Notes**

1. IV use: dilute before giving. Administer cautiously, give patient a skin test before therapy if he has a history of hypersensitivity reactions.
2. Thiamine malabsorption is most likely in alcoholism, cirrhosis, or GI disease.