Washoe County Regional EMS Protocols

NORTHERN NEVADA
Public Health

Mt. Rose
SKI TAHOE

Version 16 – Effective 07/01/2025

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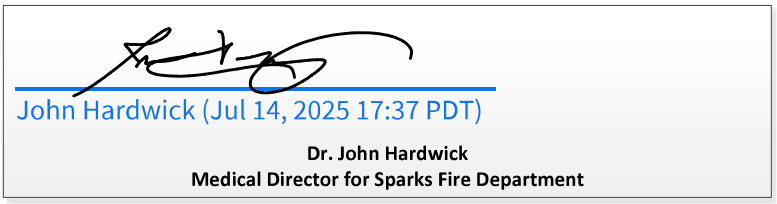
Washoe County Regional EMS Protocols Signature Page



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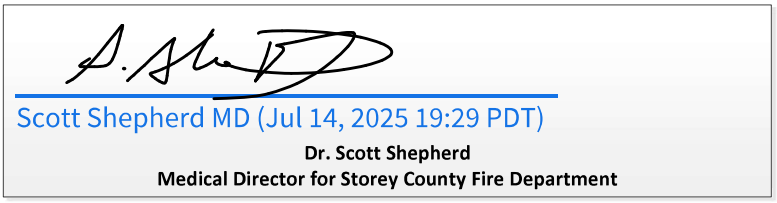

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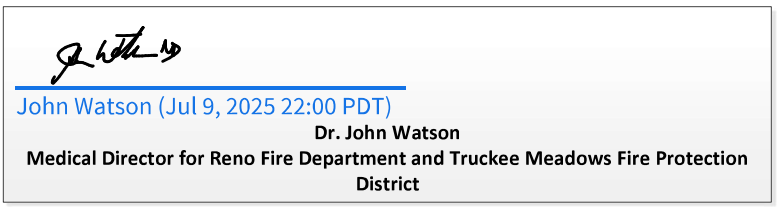

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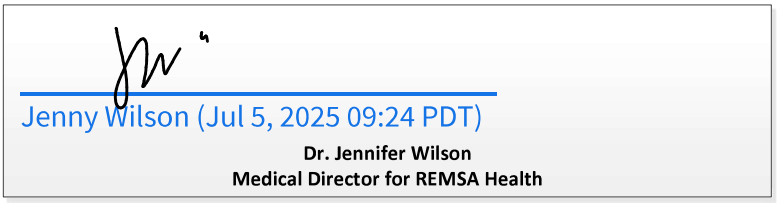

Jenny Wilson (Jul 5, 2025 09:24 PDT)

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The Washoe County Regional EMS Protocols were last reviewed and approved on July 14, 2025 for use beginning July 1, 2025.

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The Washoe County Regional EMS Protocols are intended to establish guidelines and best practices for regional patient care and treatment. Agencies utilizing these protocols may not be able to procure all medications and equipment due to availability, funding, and Medical Director discretion. All appropriately indicated medications and equipment will be utilized if available. In situations where co-responders may have differing medication or equipment complements, providers should work cooperatively and in the best interest of the patient.

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Protocol Change Log

Effective Date	Protocol Title	Summary of Changes
7/1/2025	Destination	Updated all singular instances of Northen Nevada FEDs to combined instances referencing them as Northern Nevada Freestanding Emergency Departments and/or FEDs
		Updated all instances of Northern Nevada Sierra Medical Center and (NNSMC) to Sierra Medical Center (SMC)
	Foreword	Added ER @ Damonte Ranch 775-567-6900
		Updated VA ER Phone Number to 775-328-1700
	Community Resources	Updated Northern Nevada Sierra Medical Center to Sierra Medical Center
		Added ER @ Damonte and ER @ Spanish Springs
	Radiological Response Aid	Updated name of protocol from “Radiological Response Aid” to “Radiological Response Treatment”
		Added MCI decision tree off of “Injury” branch
		Changed Safe Zone Dose from “Less than 1mR/hour to “Less than 2x Background radiation levels”
		Added “Limit time in zone to minutes only” language to Rescue Zone Dose
		Updated all instances of “control clothing or cocoon” to “remove clothing and cocoon”
	Radiological Response Quick Start Guide	Protocol Added
1/1/2025	Destination	Removed ‘Any facility accredited to care for STEMI or Stroke patients, cannot divert those patients, except in the case of an internal disaster’
7/1/2024	Sepsis	Removed ‘If suspect sepsis, call sepsis pre-alert and continue care’ box
	Nausea/Vomiting	Added ‘DROERIDOL 0.625-1.25 mg glow IV/IO/IM may repeat x1 in 10 min. Geriatrics – 0.625 mg slow IV/IO/IM may repeat x1 in 10 min.
		Added Pearl ‘Avoid DROPERIDOL for patients presenting with suspected MI, ACS, or uncorrected hypotension’
		Added Pearl ‘Do NOT co-administer with PROMETHAZINE’
	Behavioral Emergency	Added ‘DROPERIDOL 2.5-5mg slow IV/IO/IM q 5 min; max 10 mg’
		Added Pearl ‘ Do NOT co-administer with HALOPERIDOL’
	Trauma Criteria and Assessment	Updated elements of protocol to align with hospital trauma and criteria assessment protocols

Protocol Change Log

Effective Date	Protocol Title	Summary of Changes
7/1/2024	Formulary	Added DROPERIDOL Formulary
		Updated KETAMINE Formulary Contraindication/Precaution to mirror Pain Management Protocol
	Adult Medication	Added DROPERIDOL
	Destination	Added “X” under CTH for Possible Stroke in Patient Destination Table
1/1/2024	Pediatric Cardiac Arrest	Added bullet under 'Defibrillate at 4 J/kg' to read 'Subsequent Defibrillations increase in 2 J/kg increments to a max of 10 J/kg not to exceed the adult dose'
	Adult Burns/Crush Injury	Moved both Adult Burns and Crush Injury Protocols from Adult Treatment Protocols to Trauma Protocols
	Adult Medications Reference	Updated based on protocol changes
	Shock-Hemorrhagic	Added TRANEXAMIC ACID IO route
	Pediatric Medications Reference	Updated based on protocol changes
	Acute Aortic Dissection	Added new protocol
	Acute Coronary Syndrome	Removed Pearl '12-lead ECG should be obtained as soon as reasonably possible.'
		Added Pearl 'If suspected Aortic Dissection, reference Acute Aortic Dissection (Suspected) Protocol.'
	Pediatric Neonatal Resuscitation	Added bullet to top box 'If fetal demise is recognized after cord is clamped and cut, and known gestational age is < 22 weeks, treat as a miscarriage and provide supportive care to family'
1/1/2024	Pediatric Behavioral Emergency	Updated ‘Apply Cardiac monitor as needed – required with chemical restraint’ to ‘Apply cardiac monitor and monitor ETCO2 – required with chemical restraint’
		Removed box ‘Consider Pediatric Pain Management/Sedation protocol
		Added box 'MIDAZOLAM 0.2 mg/kg IV/IO/IN/IM; may repeat as needed; KETAMINE 1 mg/kg IV/IO; may repeat once after 5 minutes; max single dose 50mg -OR- KETAMINE 3mg/kg IM; max single dose 150mg
		Added Pearl 'Maximum IM of 3ccs for any fluid in a single muscle group'

Protocol Change Log

Effective Date	Protocol Title	Summary of Changes
1/1/2024	Pediatric Pain Management/Sedation	Added 'KETAMINE 1mg/kg IV/IO; may repeat once after 5 minutes; max single dose 50mg -OR- KETAMINE 3mg/kg IM; max single dose 150mg' to sedation box
		Removed arrow from second box under Pain Management pointing to 'Contact Medical Control for additional doses'. Centered this box in between Paint Management and Sedation with no arrows pointing to it.
		Removed Pearl 'Give pain management cautiously to patients who are bradycardic.'
		Added the following pearls: • If using KETAMINE, consider MIDAZOLAM to prevent reemergence phenomenon. • Monitor ETCO2 for chemical sedation. • Maximum IM of 3ccs for any fluid in a single muscle group.
8/1/2023	Traumatic Arrest Protocol	Protocol added
	Trauma Protocols Section	New section added- Moved Trauma Criteria and Assessment, Spinal Motion Restriction, Amputation, Less Than Lethal Munitions Care Protocols from Universal Section to Trauma Protocols Section
	Pediatric Airway Obstruction	Added the following pearls: • Expedite transport if unable to immediately resolve obstruction • Surgical cricothyrotomy is contraindicated in the pediatric patient
8/1/2023	Resuscitation_Prehospital Death Determination	Replaced 'Blunt trauma arrest with > 10 minute ETA to trauma center OR Penetrating trauma arrest with > 15 minute ET to trauma center' with 'Cardiac Arrest Secondary to Blunt or Penetrating Trauma'
		Replaced 'Contact Medical Control for termination orders' with 'Follow Traumatic Cardiac Arrest Protocol'
07/01/2023	Hyperglycemia/Hypoglycemia	Added the Pearl “Lactated Ringers is the preferred solution for patients when DKA is suspected.”
	Foreword	Added ER @ Spanish Springs
01/01/2023	Pediatric Pain Management/Sedation	Updated spelling of Acetaminophen

Protocol Change Log

Effective Date	Protocol Title	Summary of Changes
01/01/2023	Cardiac Post Arrest Care	Replace 'Is patient unconscious' and steps below it with 'Continue supportive care'
	Hypothermia Post ROSC	Remove protocol
	Stroke	Remove 'onset' and change Last Know Normal to Last Known Well
	Pain Management	Add IV to Acetaminophen
	Adult Medications	Updated for Acetaminophen IV
07/01/2022	Stroke	Removed Pearl
	Behavioral Emergency	Change Ketamine to 1 mg/kg IV, may repeat once after 5 min OR 3 mg/kg IM; max dose 300 mg

	Pain Management/Sedation	• Change into two separate protocols – Pain Management; Sedation
		• Updated language in pearls for each
		• Sedation update:
		  ○ Ketamine 1 mg/kg IV/IO may repeat once after 5 min; 3 mg/kg IM single dose; Max dose 300 mg
		• Pain Management update:
		  ○ Fentanyl 0.5-1.5 mcg/kg IV/IO/IN/IM max single dose 100 mcg, may repeat q 5 min as needed
		  ○ Morphine Sulfate 1-5 mg IV/IO may repeat q 10 min as needed

03/15/2022	Operational Appendix	Remove Appendix C and move Radiological Response Aid to Operational Protocols
01/01/2022	Acute Coronary Syndrome	Add to pearls 'Consider MFE pad placement of pads prior to hospital arrival on STEMI patients'
	Pain Management/Sedation	Remove Bloomsbury Sedation Scale Add to pearls: • Strongly consider alternative agents to KETAMINE for patients with a suspected head injury • When administering pain medications to patients with a higher potential for adverse reaction (elderly, intoxicated, opiates or depressants already on board, etc.) use caution and consider the need for a lower starting dose to achieve the desired effect. • Consider chemical sedation for patients presenting with agitation secondary to possible hyper-sympathetic response (excited delirium, drug induced psychosis, etc.).

Protocol Change Log

Effective Date	Protocol Title	Summary of Changes
	References	Add the Richmond Agitation & Sedation Scale to the References with Bloomsbury Sedation Scale
	Behavioral Emergency	Add to pearls: • Strongly consider alternative agents to KETAMINE for patients with a suspected head injury
	Combative Patient Protocol	New protocol under Operational
	Medication Assisted Intubation	Reword Etomidate to '0.3 mg/kg IV/IO, may repeat X 1 to a max dose of 0.6 mg/kg'
	Cardiac-Wide Complex Tachycardia	Amiodarone and Synchronized Cardioversion to same box with OR between, add 'if clinically indicated' and 'Consider Pain Management/Sedation…' as bullet after Synchronized Cardioversion
07/01/2021	Shock-Hemorrhagic	Add to pearls 'if unable to establish IV access, consider TRANEXAMIC ACID IM in 2 doses in 2 separate locations Change dosing for TRANEXAMIC ACID
	Paint Management/Sedation	Add Ketorolac to Pain Management Add to pearls Ketorolac contraindications
	Formulary	Add Ketorolac, including note regarding potential pregnant woman under contraindications

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Foreword

This patient care document has been specifically developed for Washoe County EMS responders. The purpose of this manual is to provide guidance for *ALL* prehospital care providers. In any such protocol, certain assumptions are made regarding the condition of the patient, expected responses to treatment, and the availability of resources. Since these assumptions will not always be true, the emergency medical technician must use these protocols as a guide, as well as, agency specific Medical Director endorsed medications and procedures.

NOTHING contained within these protocols is meant to delay rapid patient transport to a receiving facility. Patient care should be rendered while en-route to the hospital when transport is available.

The majority of these protocols generally reflect a conservative and accepted standard for treatment. The technician in charge at an emergency medical incident is encouraged to use judgment in the application of these protocols. If a treatment plan appears to be insufficient for any reason, medical control consultation is encouraged. The medical control physician directing care in the field retains discretion in ordering specific forms of treatment, even if that treatment is in conflict with these guidelines. Obviously, to proceed with an order directed by medical control requires that both the physician and the provider 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 in the care of the patient. Additionally, the provider must feel capable, based on the instructions given by the medical control physician, of correctly performing the directed care. Whenever such care is provided, it is necessary for the patient care report (PCR) documentation to describe the circumstances which necessitated the deviation, as well as document the physician's name who gave the order(s), the treatment change and the time of the order.

Occasionally, a situation may arise in which a physician's order cannot be carried out due to the provider's sense that the administration of an ordered treatment would endanger the patient, the particular medication is not available, or that a physician's order is outside of protocol or NRS statute. If this occurs, the provider must immediately notify the medical control 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 administered.

Per Nevada Administrative Code 450B.180 a "Patient" is:

Any person who is sick, injured, wounded, or otherwise incapacitated or helpless and who is carried in an ambulance or air ambulance or is cared for by an emergency medical dispatcher, emergency medical responder, emergency medical technician, advanced emergency medical technician, paramedic or registered nurse.

Pediatric Patient Definition

- Pediatric treatment protocols are to be used on children who are age 12 and under. If age is unknown and/or there are obvious signs of puberty, the patient may be treated as an adult.

Commitment to STAR Care

The following is a checklist you can use to analyze almost any patient care issue you might encounter. Go through the list in order from top to bottom, and ask yourself if your care meets each criterion. If it does, chances are that you can defend your actions in almost any forum.

- **Safe -** Were my actions safe -- for me, for my colleagues, for other professionals and for the public?
- **Team-Based -** Were my actions taken with due regard for the opinions and feelings of my co-workers, including those from other agencies?
- **Attentive to Human Needs -** Did I treat my patient as a person? Did I keep him/her warm? Was I gentle? Did I use his/her name throughout the call? Did I tell him/her what to expect in advance? Did I treat his/her family and/or relatives with similar respect?
- **Respectful -** Did I act toward my patient, my colleagues, the first-responders, the hospital staff and the public with the kind of respect that I would have wanted to receive myself?

Foreword

STAR Care (Continued)

- **Customer-Accountable -** If I were face-to-face right now with the customers I dealt with on this response, could I look them in the eye and say "I did my very best for you."
- **Appropriate -** Was my care appropriate--medically, professionally, legally and practically – considering the circumstances I faced?
- **Reasonable -** Did my actions make sense? Would a reasonable colleague of my experience have acted similarly, under the same circumstances?
- **Ethical -** Were my actions fair and honest in every way? Are my answers to these questions?

EMS Agency Medical Directors

Jenny Wilson, MD, REMSA
John Watson, MD, Reno Fire Department, Truckee Meadows Fire Protection District
Lisa Nelson, DO, North Lake Tahoe Fire Protection District, Mt. Rose Ski Patrol
John Hardwick, MD, Sparks Fire Department & Reno-Tahoe Airport Authority Fire Department
Scott Shepherd, MD, Storey County Fire Protection District

Washoe County Hospitals

Incline Village Community Hospital
Northern Nevada Medical Center
Sierra Medical Center
Renown Regional Medical Center
Renown South Meadows Medical Center
Saint Mary's Regional Medical Center
Veteran's Affairs Sierra Nevada Healthcare System

Phone Numbers

REMSA Dispatch	775-858-6005
Sparks Dispatch	775-353-2231
Reno Dispatch	775-334-2306
TMFPD Dispatch	775-785-4253
RPD/WCSO Dispatch	775-334-3855
Nevada Highway Patrol Dispatch	775-688-2830
ER@ Damonte Ranch	775-567-6900
ER @ McCarran Northwest	775-900-6700
ER @ Spanish Springs	775-567-5400
Northern Nevada Medical Center ER	775-356-4040
Renown Main ER	775-785-6295
Renown South Meadows ER	775-982-7373
Saint Mary's ER	775-322-9424
Sierra Medical Center	775-799-7399
Veteran's Affairs (VA) ER	775-328-1700
State of Nevada Elderly Services	888-729-0571 or 775-784-8085 (after hours)
Washoe County Child Protective Services	775-785-8600 or 775- 784-8090 (after hours)
Poison Control Center	1-800-222-1222

From time to time, protocols may be added or revised with approval of Medical Direction. Recommendations are welcome and appreciated at anytime. Recommendations may be submitted to the Northern Nevada Public Health EMS Coordinator for consideration and referral to the Medical Directors via email at EMSProgram@nnph.org.

References

Glasgow Coma Scale		
EYE OPENING	Spontaneous	4
	To voice / verbal command / shout	3
	To pain	2
	No response	1
VERBAL RESPONSE	Orientated / Converses (PEDS: Appropriate words, smiles, coos)	5
	Confused (PEDS: Inappropriate words, cries)	4
	Inappropriate words (PEDS: Cries and/or screams, irritable)	3
	Incomprehensible sounds (PEDS: Grunts, restless, agitated)	2
	No response	1
MOTOR RESPONSE	Obeys verbal commands	6
	Localizes pain	5
	Withdraws to pain (PEDS: Flexion, withdrawal)	4
	Flexes to pain (Decorticate rigidity)	3
	Extends to pain (Decerebrate rigidity)	2
	No response	1
GCS Total = Eye Opening + Verbal Response + Motor Response		

APGAR			
DESCRIPTION	**0**	**1**	**2**
Appearance	Blue, Pale	Body: Pink / Ext: Blue	Completely Pink
Pulse	Absent	< 100	> 100
Grimace	No Response	Grimace	Cries
Activity	Limp	Some Flexion	Action Motion
Respirations	Absent	Slow, Irregular	Strong Cry

Mean **A**rterial **P**ressure (**MAP**)

MAP = ((DBP x 2) + SBP)/ 3
OR
MAP = DBP + 1/3 (SBP – DBP)
OR
MAP = DBP + (PP/3)

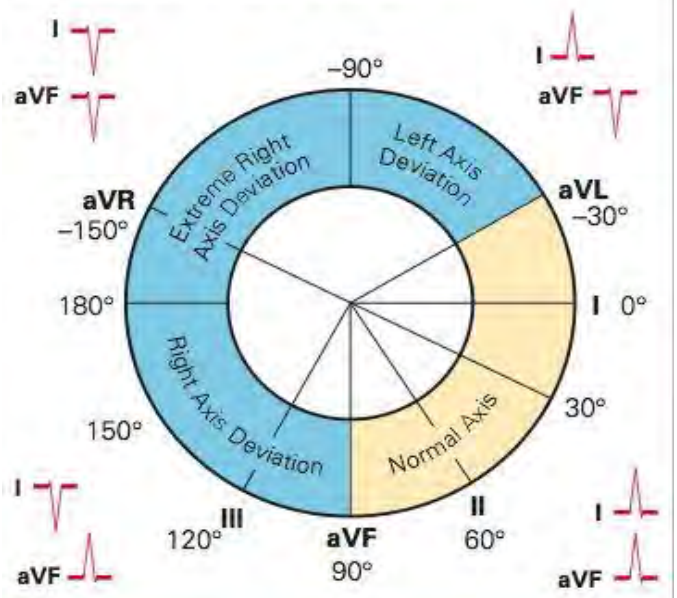
Richmond Agitation & Sedation Scale (RASS)		
Score		**Description**
+4	Combative	Violent, immediate danger to staff
3	Very Agitated	Pulls at or removes tubes, aggressive
2	Agitated	Frequent non purposeful movements, fights ventilator
1	Restless	Anxious, apprehensive but movements not aggressive or vigorous
0	Alert & Calm	
-1	Drowsy	Not fully alert, sustained awakening to voice (eye opening & contact > 10 sec)
-2	Light Sedation	Briefly awakens to voice (eye opening & contact < 10 sec)
-3	Moderate Sedation	Movement or eye-opening to voice (no eye contact)
-4	Deep Sedation	No response to voice, but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

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	Unable to rouse/natural sleep

AGE	HEART RATE	RESPIRATIONS	SBP
Neonates (1-28 days)	120-160	40-60	>60
Infant (1-12 months)	100-120	25-50	70-95
Children (1-8 years)	80-100	15-30	80-110
School Age (8-11 years)	65-110	18-30	97-112
Adolescent (12-15 years)	60-90	12-26	112-128
Adult	60-100	12-18	100-135

Electrical Axis of the Heart

The electrical axis is the sum total of all electrical currents generated by the ventricular myocardium during depolarization. Analysis of the axis may help to determine the location and extent of cardiac injury, such as ventricular hypertrophy, bundle branch block, or changes in the position of the heart in the chest (from, e.g., pregnancy or ascites).
The direction of the QRS complex in leads I and aVF determines the axis quadrant in relation to the heart.



Clinical Tip: Extreme right axis deviation is also called indeterminate, "no man's land," and "northwest."

FAST-ED Stroke Score

Item	FAST-ED Score	NIHSS Score Equivalence
Facial Palsy		
Normal or minor paralysis	0	0-1
Partial or complete paralysis	1	2-3
Arm Weakness		
No drift	0	0
Drift or some effort against gravity	1	1-2
No effort against gravity or no movement	2	3-4
Speech Changes		
Absent	0	0
Mild to moderate	1	1
Severe, global aphasia, or mute	2	2-3
Eye Deviation		
Absent	0	0
Partial	1	1
Forced deviation	2	2
Denial/Neglect		
Absent	0	0
Extinction to bilateral simultaneous stimulation in only 1 sensory modality	1	1
Does not recognize own hand or orients only to one side of the body	2	2

Suspected Infection	2 or more SIRS Criteria	Minimum One indicator of Acute Organ Dysfunction
Pneumonia	HR > 90 bpm	Acute Altered Mental Status
UTI	Temp < 96.9 OR > 100.4°F	SBP < 90 mmHg OR MAP < 70 mmHg
Bacteremia	RR > 20 bpm	SBP decrease > 40 mmHg from baseline
Abscess/Cellulitis	$PaCO_2$ < 32 mmHg	BS > 140 mg/dl without hx of diabetes
Abdominal	WBC ≤ 4 OR ≥ 14	Acute Hypoxia/Increase in O_2 requirements
Bone/Joint	Bands > 10%	Arterial hypoxemia (PaO_2/FiO_2 < 300)
Endocarditis		Acute oliguria (< 0.5 mL/kg/hr for 2 hrs)
Meningitis		Creatinine > 2 mg/dl or increase in 0.5 above baseline
		Coagulopathy INR > 1.5, PTT > 60 sec
		Thrombocytopenia Platelets < 100K
		Bilirubin > 2 mg/dl
		Lactate > 2 mmol/L

UNIVERSAL TREATMENT PROTOCOLS

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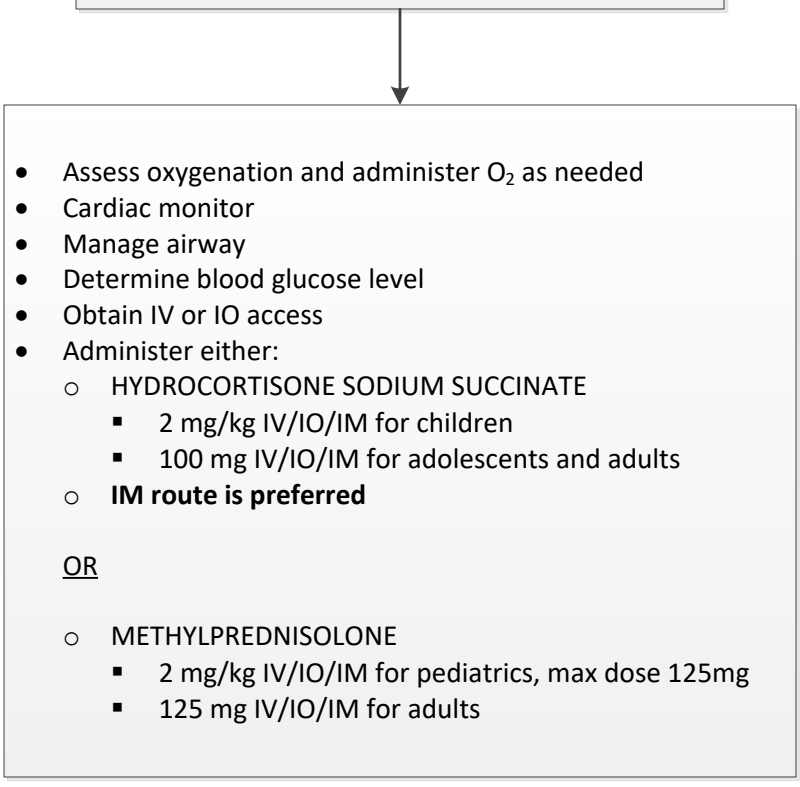
Acute Adrenal Crisis

Patient with signs and symptoms of:

- Shock
- Cardiovascular instability
- Hyperkalemic arrhythmias

AND

- Have a documented diagnosis of Congenital Adrenal Hyperplasia or another form of adrenal insufficiency.

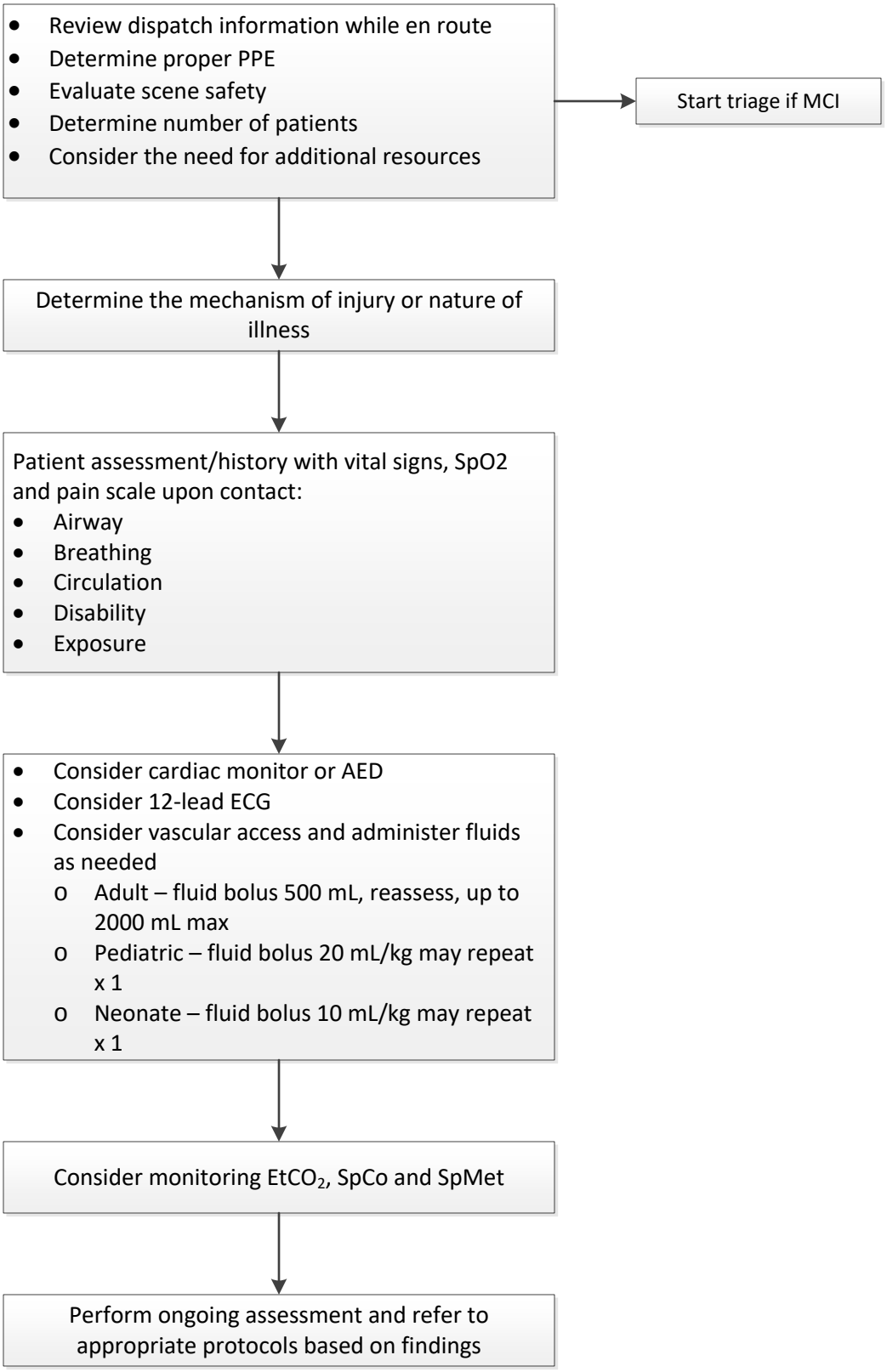


- Assess oxygenation and administer O_2 as needed
- Cardiac monitor
- Manage airway
- Determine blood glucose level
- Obtain IV or IO access
- Administer either:
  - HYDROCORTISONE SODIUM SUCCINATE
    - 2 mg/kg IV/IO/IM for children
    - 100 mg IV/IO/IM for adolescents and adults
  - **IM route is preferred**

  OR

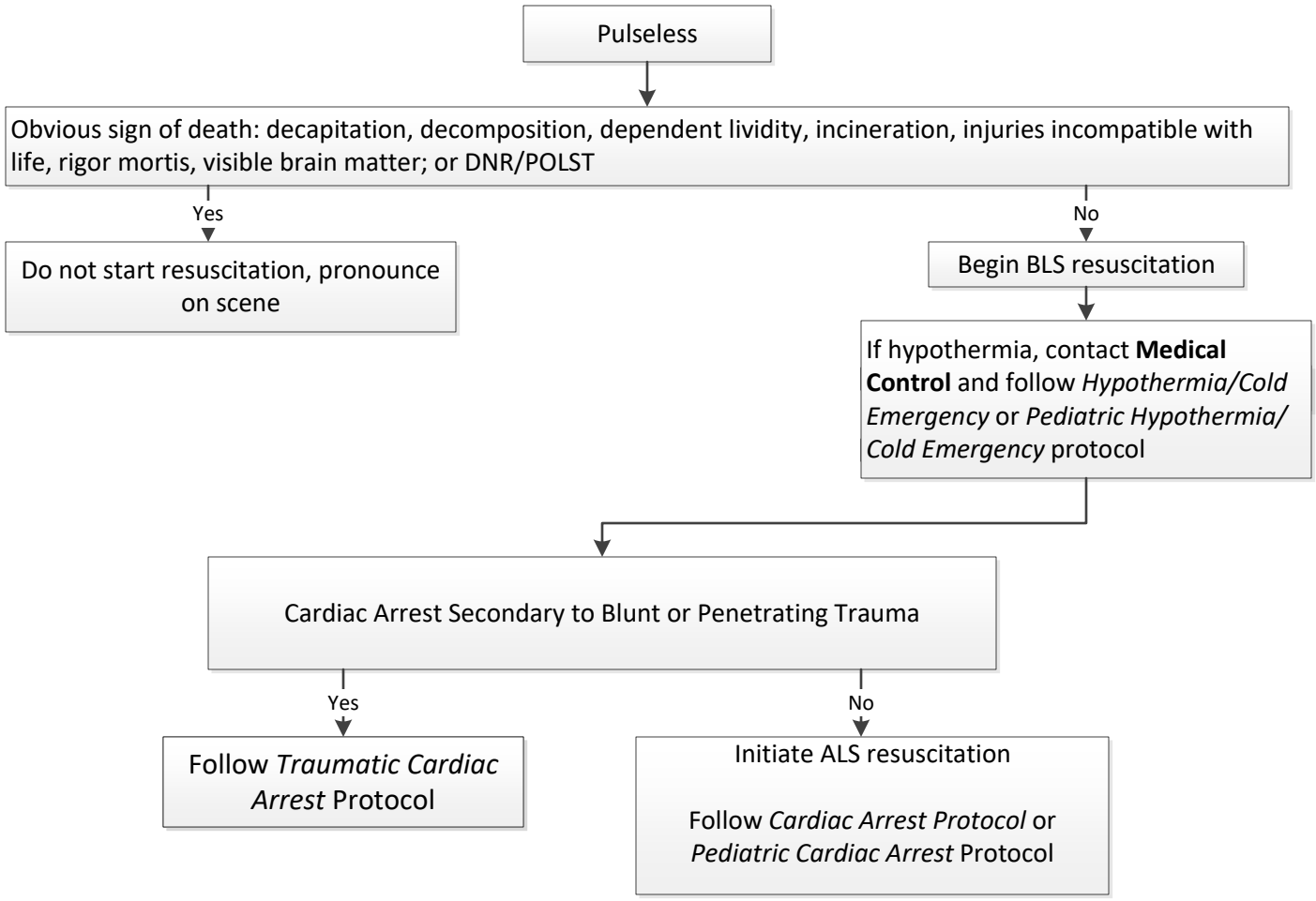
  - METHYLPREDNISOLONE
    - 2 mg/kg IV/IO/IM for pediatrics, max dose 125mg
    - 125 mg IV/IO/IM for adults

General Patient Assessment



Resuscitation/Prehospital Death Determination

Washoe County Regional Protocols



When death has been established:

- If possibility of criminal implications, try to leave patient in position found.
- Secure the body and surrounding area until law enforcement arrives.
- Obvious death as described above does NOT require a cardiac monitor strip.
- All other cases of pronounced death MUST have a cardiac monitor strip. Document time of death, name of physician who pronounced death, and the names of law enforcement personnel who take custody of patient if coroner not available.

Pearls:

- The paramedic may cease resuscitation if initiated prior to arrival and patient shows obvious and accepted signs of death or if resuscitation is initiated prior to arrival and DNR or POLST is presented.
- Arrests resulting from electrical injury; treatments should be early, aggressive and persistent. Resuscitation efforts have high success rates even when resuscitation attempts are prolonged.

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TRAUMA PROTOCOLS

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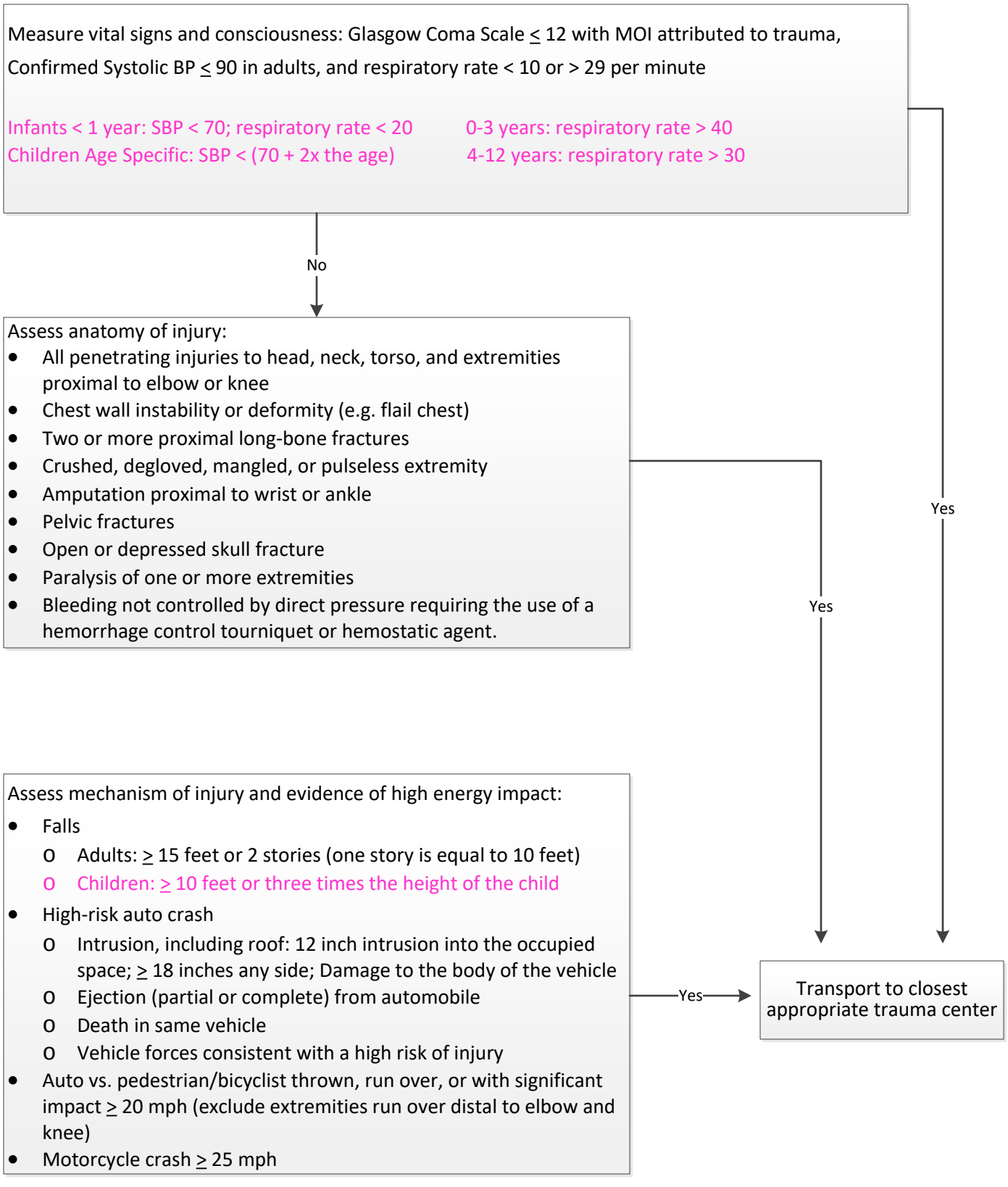
Trauma Criteria and Assessment

Washoe County Regional Protocols

Patient with trauma means a person who has sustained injury and meets the triage criteria used to evaluate the condition of the patient (NAC450B.798). Criteria in Pink specific to Pediatrics.



Consider contacting **Medical Control** for direction:

Older Adults

- Risk of injury/death increases after age 55 years
- Age ≥ 65 with SBP < 100
- Low impact mechanisms (e.g. ground level falls) may result in severe injury

Children

- Should be triaged preferentially to the appropriate pediatric capable trauma center

Anticoagulants and bleeding disorders

- Patients with head injury are at high risk for rapid deterioration

Burns

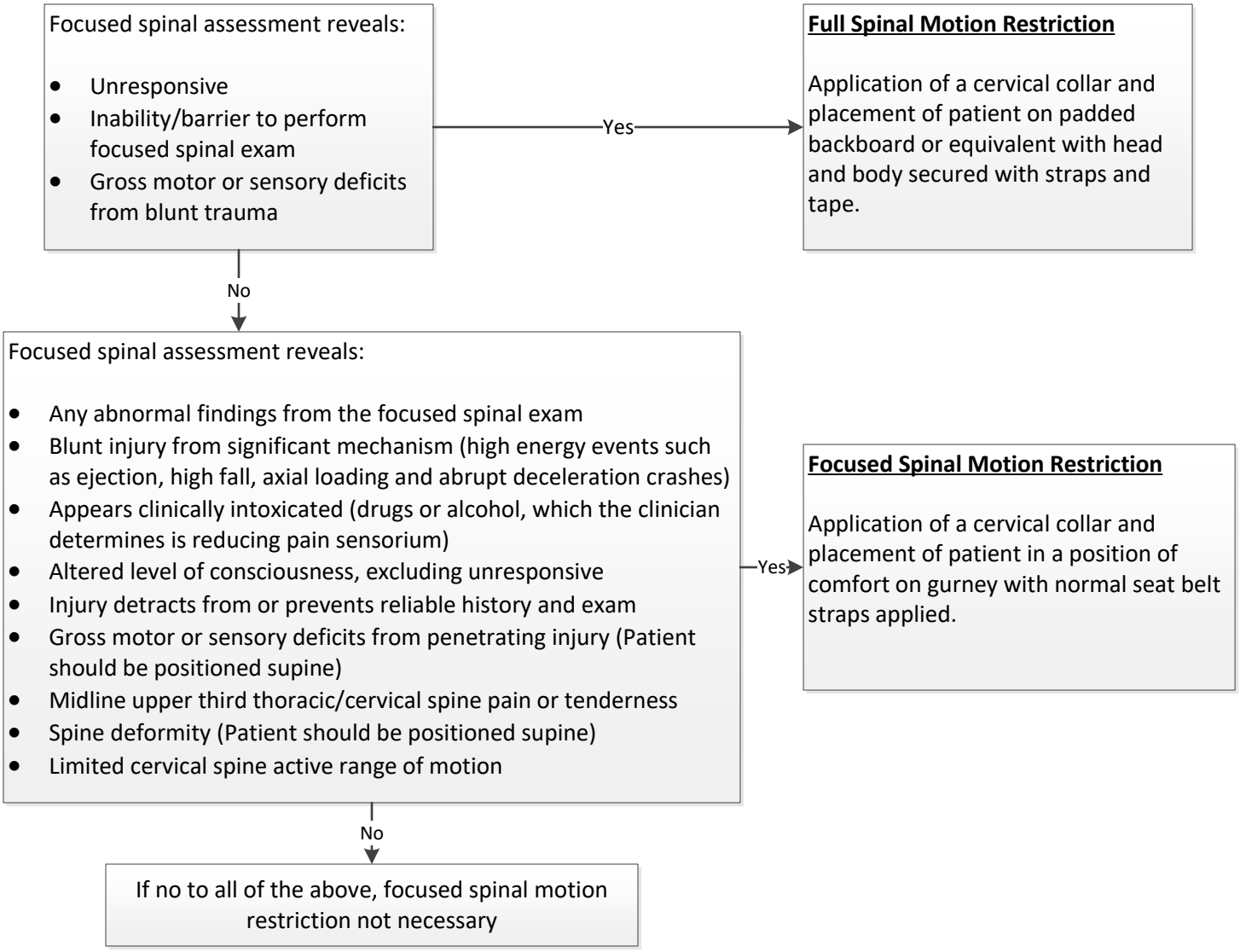
- Without other trauma mechanism: triage to burn facility
- With trauma mechanism: triage to trauma center

Pregnancy > 20 weeks

Spinal Motion Restriction

Conduct a focused spinal exam:

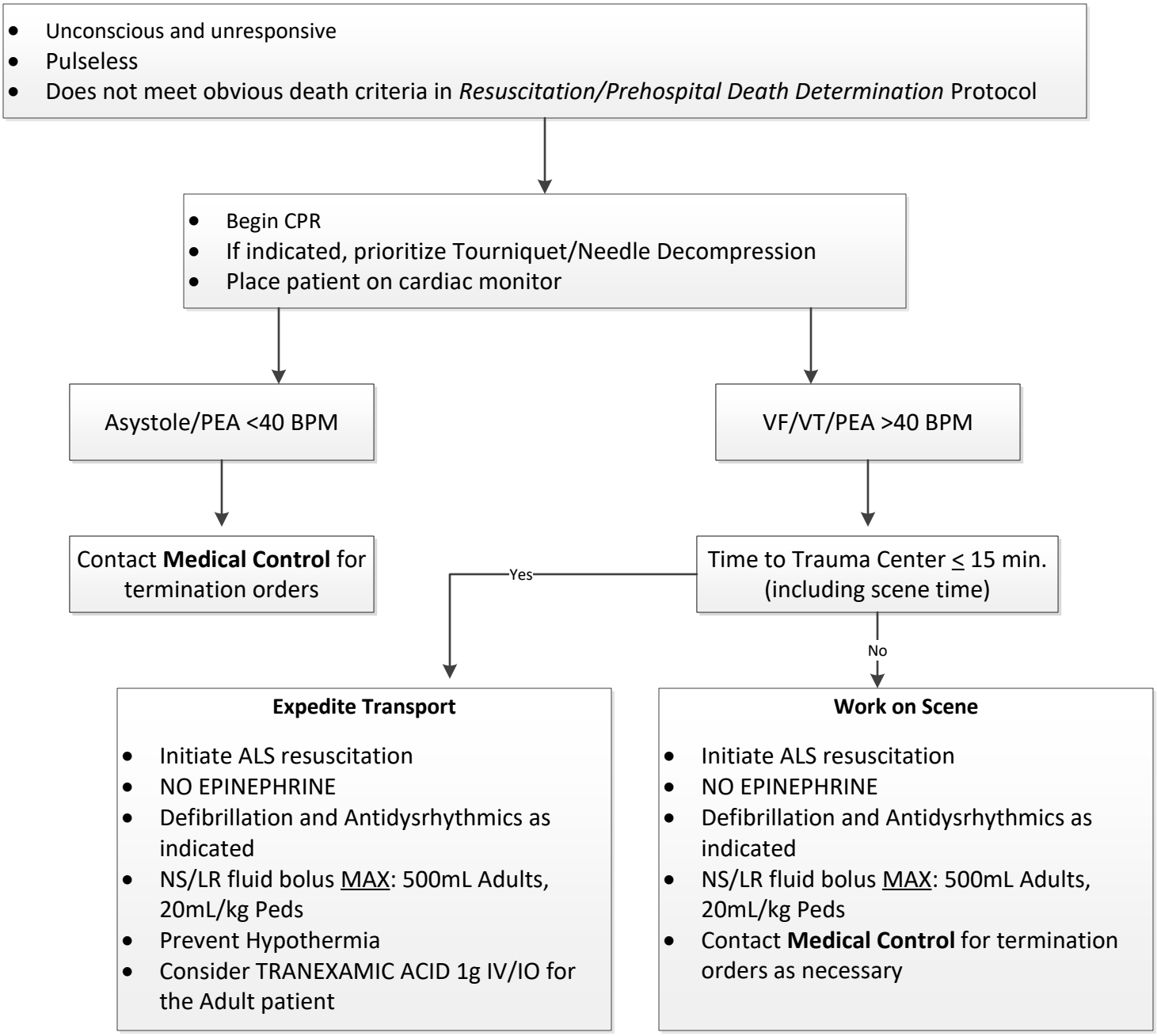
- Can the patient focus on the exam or are they in severe distress from other injuries or emotional stressors? (distracting injury)
- Assess distal CMS/bi-lateral grips/push-pull.
- Palpate the entire spine on the boney processes one at a time from C1 to L5. Patient should not have focal midline tenderness to palpation or obvious deformity.
- Ask the patient to rotate their head 45 degrees from side to side without assistance, which should be pain free.



Pearls:

- Consider modified restriction in any patient with arthritis, cancer, dialysis, kyphosis or other underlying spinal or bone disease or who may have increased risk of spinal compromise.
- Any patient may be motion restricted based on EMS provider discretion.

Traumatic Cardiac Arrest



Pearls:

- Consider Mechanism of Injury when prioritizing interventions

Amputation

- Resuscitate and treat other more urgent injuries
- Control bleeding with appropriate measures
  - Tourniquet proximal to injury if other measures ineffective
- Obtain IV access
- Consider *Pain Management* or *Sedation* protocol or *Pediatric Pain Management/Sedation* protocol.

Amputation

- Rinse wound with sterile saline, place moist sterile dressing over stump and pressure wrap
- Rinse amputated part in sterile saline, wrap in dry pads and place in dry container on ice. Avoid possible cold injury to part. Transport part with patient

Partial Amputation

- Control bleeding
- Splint in anatomical position and stabilize securely
- Cover with moist saline dressing
- Do not remove foreign bodies
- Save any avulsed tissue

Some patients may bypass the nearest trauma center and be directly transferred to a burn center based on the destination protocol.

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
- 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

Consider *Pain Management* protocol

Electrical Burn/Lightning

- Protect rescuers from live electric wires
- Separate victim from electrical source when safe for rescuers
- Initiate CPR as needed
  - For victims in cardiac arrest, treatment should be early, aggressive, and persistent
  - Victims with respiratory arrest may require only ventilation and oxygenation to avoid secondary hypoxic cardiac arrest
  - Resuscitation attempts may have high success rates and efforts may be effective even when the interval before the resuscitation attempt is prolonged
- Place patient on cardiac monitor
- Obtain vascular access
- Treat any thermal burns as outlined above
- Assess for other injuries

- Consider *Pain Management* protocol
- Treat dysrhythmias per protocol

Some patients may bypass the nearest trauma center and be directly transferred to a burn center based on the destination protocol.

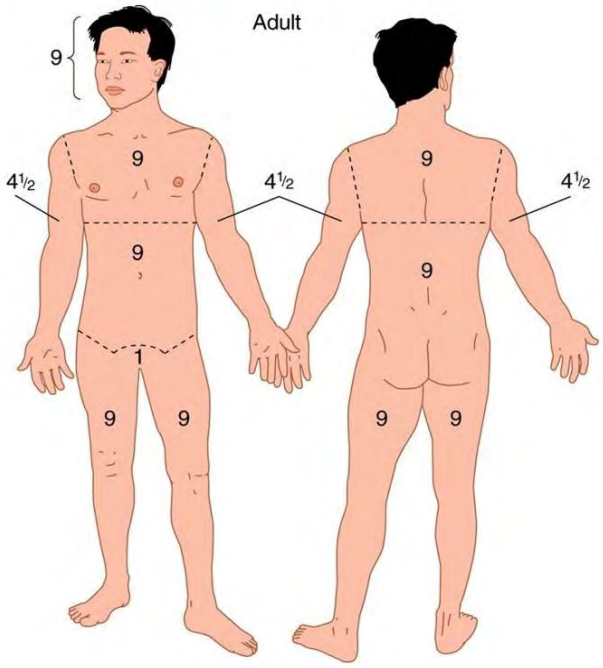
Thermal Burns

- Remove clothing which is smoldering and non-adherent to the patient
- Assess oxygenation and administer Oxygen as needed
- Assess and treat associated trauma/smoke inhalation
- Remove rings, bracelets and other constricting objects
- Determine burn body surface area (BSA)
  - 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 administer 500 mL per hour
- If transport time is less than 15 minutes, run IV at wide open rate
- LR is preferred

Consider *Pain Management* protocol



Pearls:

- Consensus Burn Formula:
  Flame, Scald, Chemical – 2ml/kg x %TBSA
  Electrical - 4 mL/kg x TBSA
  - Administer 50% of total fluids in first 8 hours from time of injury
  - Administer 50% of total fluids over next 16 hours
- BSA is calculated for partial thickness and full thickness burns.

Crush Injury

A crush injury is when a patient or part of the patient's body is entrapped or compressed for a time greater than 30 minutes. It may also be applied to a patient who, due to fall or overdose, has had no movement in an extremity for greater than 4 hours.

- Administer fluid bolus
  - 20 mL/kg for adults, followed by maintenance infusion of 500-1500 mL/hour
  - It is recommended a minimum of 500-1000 mL be given prior to releasing the patient or extremity from the compression
- SODIUM BICARBONATE 1 mEq/kg in 1000 mL of NS wide open (consider this part of fluid bolus)
- If Hyperkalemia suspected, see *Hyperkalemia* protocol
- Extremity management
  - Do not use ice packs or elevation of extremities

- Consider *Pain Management* or *Sedation* protocol as needed
- FENTANYL is recommended over MORPHINE due to vasodilatory effects of MORPHINE SULFATE

Pearls:

- Compartment syndrome is usually due to a crush injury and because of prolonged compression or pressure the interstitial pressure within a closed anatomical space exceeds the perfusion pressure. It occurs most commonly in the pelvis and lower extremities, but may also occur in the upper extremities or trunk. Compartment syndrome may result in ischemic swelling, muscle infarction, nerve injury and permanent loss of extremity function.

Less than Lethal Munitions Care

Washoe County Regional Protocols

Less than lethal munitions 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 than lethal munitions 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 should be transported to the Emergency Department for further evaluation and care, unless the patient has the capacity and competence to refuse care and sign an AMA.
- 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.
- Assess and treat with appropriate protocol according to findings and patient signs and symptoms.

Pepper Spray (Oleoresin Capsicum)/ CS Gas (Tear Gas) Exposure Care

- Be aware of cross contamination when treating patients
- Severe complications are possible with the following patients:
  - Elderly
  - Cardiac
  - COPD
  - Asthma
- Flush the affected eye(s) with normal saline.
  - Be careful not to flush into an unaffected eye
- Capsicum exposure can also be neutralized with commercial wipes or spray
- Always wear gloves & eye protection when flushing contaminated patients
- If the patient is experiencing eye pain secondary to pepper spray, apply appropriate ophthalmic anesthetic agent to numb the affected eye(s)

→ Treat respiratory complaints per *Respiratory Distress* Protocol

Taser Dart Care

- Assess the patient for secondary injuries after Taser application
- Energy from a Taser can ignite flammable liquids and gasses
- If the Taser dart has penetrated the eye or other sensitive area such as the face, neck, or groin:
  - Immobilize the dart; cut the wires right above the dart and transport
- To remove the darts in other areas:
  - Pull the skin taut and pull the dart(s) straight out
- Clean the site around the wound
- Advise the patient to beware for signs of infection

Kinetic Impact Munition Care

- The common kinetic impact munitions include bean bag rounds, plastic or wooden projectiles, and rubber sting balls
- All kinetic impact munitions have the potential to cause severe injury/death
- Persons struck by these munitions require a thorough assessment
- Some kinetic munitions contain pepper spray or tear gas- use the same cautions listed for these substances

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ADULT TREATMENT PROTOCOLS

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Acute Aortic Dissection (Suspected)

- OXYGEN: Maintain SpO2 ≥ 94%.
- 12-Lead ECG – If suspected STEMI, refer to *Acute Coronary Syndrome (Suspected)* Protocol.

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- Obtain Vascular Access.
- Aspirin is contraindicated in these patients.
- Consider *Pain Management* with **Fentanyl** and/or **Morphine**.
- Refer to *Nausea/Vomiting* Protocol as needed.

↓

- Contact **Medical Control** for possible administration of METOPROLOL 5 mg slow IV.

Treatment Goals:
HR ≤ 60
SBP ≤ 120

Pearls:

- **Presenting Symptoms:** Abrupt onset of severe "ripping" or "tearing" chest/back/abdominal pain that can present with paresthesia or numbness in extremities. Differing bilateral blood pressures, absent/diminished peripheral pulses, or mottling in extremities.
- Patients who present as restless, agitated, and/or in extreme pain should be aggressively managed with opiates.
- 12-Lead ECG should be obtained as soon as reasonably possible.
- If Hypotensive, refer to *Cardiogenic Shock Protocol* and expedite transport.
- Dissection is referred to as the 'great mimicker.'

Acute Coronary Syndrome (Suspected)

Washoe County Regional Protocols

12-lead ECG

- Vascular Access
- Oxygen - Keep $SpO_2 \geq 94\%$
- ASPIRIN – 324 mg PO

NITROGLYCERIN:

- If SBP > 100, 0.4 mg SL; may repeat q 5 min until pain free
- Consider 1 inch of NITROGLYCERIN PASTE if ETA to hospital > 15 minutes

Note: Avoid NITROGLYCERIN if suspected or known use of sildenafil (Viagra) or vardenafil (Levitra) within the previous 24 hours or tadalafil (Cialis) within the previous 48 hours

Consider *Pain Management/Sedation* with FENTANYL and/or MORPHINE

Refer to *Nausea/Vomiting* protocol as needed

If SBP > 140 & HR > 100 in a STEMI patient; contact **Medical Control** for possible administration of METOPROLOL 5 mg slow IV

STEMI Criteria

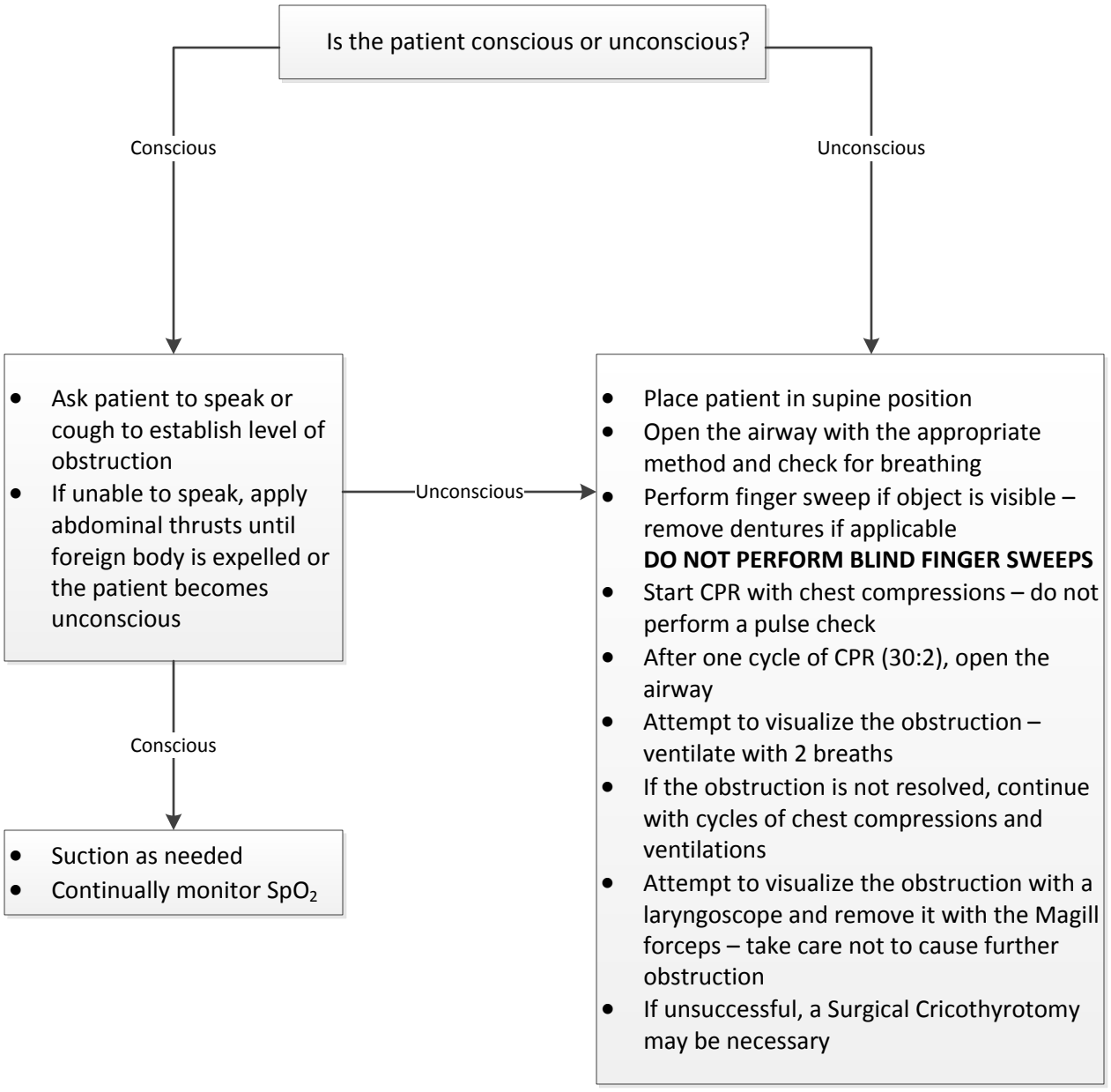
ST segment elevation in two or more contiguous leads;

- ≥ 1mm elevation in leads I, II, III, AVF, AVL, V1, V4, V5, V6
- ≥ 2mm elevation in leads V2, V3

Pearls:

- NITROGLYCERIN and MORPHINE are contraindicated in patients with RVI, consider fluid bolus.
- Diabetic, geriatric and female patients often have an atypical presentation.
- Perform a 12-lead ECG on all patients 35 years of age or older experiencing vague jaw/chest/abdominal discomfort.
- Consider 15-lead ECG or alternate lead placement for inferior MI / Posterior MI, suspected ACS with normal 12-lead, or ST depression in the precordial leads. For a 15-lead, use leads V4 for V4R, V5 for V8, and V6 for V9. Immediately relabel the 15-lead print out to avoid confusion.
- Consider MFE pad placement of pads prior to hospital arrival on STEMI patients.
- If suspected Aortic Dissection, reference *Acute Aortic Dissection (Suspected)* Protocol.

Airway Obstruction



Pearls:

- If the patient presents with trismus and noisy respirations, insert a NPA and attempt to assist ventilations with a BVM.
- Avoid hyperventilation.
- Maintain $EtCO_2$ at 35-45.

Allergy/Anaphylaxis/Dystonia

Anaphylaxis is defined as an acute onset of an illness (over minutes to several hours) involving the skin, mucosal tissue, or both (e.g., generalized hives, pruritus or flushing, swollen lips-tongue-uvula) and respiratory compromise (e.g., dyspnea, wheeze-bronchospasm, stridor, reduced peak expiratory flow, hypoxemia) and/or reduced BP or associated symptoms of end-organ dysfunction (e.g., hypotonia [collapse] syncope, incontinence).

- Assess oxygenation and administer oxygen as needed
- Assess severity of allergic reaction

Allergy/Anaphylaxis

MILD - Swelling, itching, redness, hives

- DIPHENHYDRAMINE 25-50 mg IM/IV/PO, if established

MODERATE - Mild plus wheezing and difficulty swallowing, mild hypotension:

- Obtain IV access; NS fluid bolus
- DIPHENHYDRAMINE 25-50 mg slow IV push
- ALBUTEROL unit dose HHN, as needed
- Consider EPINEPHRINE, 0.3 mg 1:1,000 IM (if not contraindicated) - with rapid progression of signs/symptoms or history of severe allergic reaction
- If reaction is worsening despite treatment, move to *SEVERE*

SEVERE - Impending respiratory failure, severe hypotension

- Secure Airway
- EPINEPHRINE 0.3 mg (0.3 mL) 1:1,000 IM (if not contraindicated)
- DIPHENHYDRAMINE 25-50 mg slow IV push
- METHYLPREDNISOLONE 125 mg IV/IO
- EPINEPHRINE 0.1 mg (1 mL) 1:10,000 IV repeated up to three times followed by 100 mL NS
- Treat signs and symptoms of shock as necessary

Dystonia

- Obtain IV access
- DIPHENHYDRAMINE 25-50 mg IV/IM

Behavioral Emergency

Patient restraint – when patient is a threat to themselves, bystanders or EMS personnel

- Patients may be restrained with soft restraints
- Restraining opposing muscle groups (swimmers position) is most effective; never restrain in prone/hog-tied position
- Assess distal CMS after restraint, every 10 minutes
- Maintain and monitor the oxygenation
- Obtain vascular access as needed
- Apply cardiac monitor as needed – **Required with chemical restraint**
- Document reasons for restraint
- Incarcerated person may be restrained at the discretion of Law Enforcement
  - For handcuffed patients, request Law Enforcement accompaniment

Consider use of a chemical restraint:

- DROPERIDOL 2.5-5 mg slow IV/IO/IM q 5 min; max 10 mg
- HALOPERIDOL 5-10 mg IV/IM q 5-10 min; max 15 mg
- MIDAZOLAM 2-5 mg slow IV/IO/IM/IN q 5 mins titrated to effect; Total dose 10 mg
- KETAMINE 1 mg/kg IV/IO may repeat once after 5 minutes OR 3 mg/kg IM single dose; max dose 300 mg

Pearls:

- Do NOT CO-administer DROPERIDOL and HALOPERIDOL.
- KETAMINE is contraindicated for patients with a history of schizophrenia.
- Use caution when using KETAMINE for suspected alcohol intoxication.
- Strongly consider alternative agents to KETAMINE for patients with a suspected head injury.
- If using KETAMINE, consider MIDAZOLAM to prevent reemergence phenomenon.
- Hostile, angry or unwilling patients who are competent may refuse service.
- Ensure the patient is searched for weapons prior to transport.

Cardiac - Arrest

- Unconscious and unresponsive
- Pulseless
- Does not meet *Resuscitation/Prehospital Death Determination* protocol

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- Begin CPR- pulse check/rhythm interpretation every 2 minutes
  - Continue CPR following all pulse checks as indicated by patient condition
- Place patient on cardiac monitor or AED
  - Utilize MFE pads and CPR assist devices
- Manage airway as indicated by patient condition
- Consider reversible causes

VF, pVT, TdP

↓

- Defibrillate
- 2 min CPR prior to medication administration
- Obtain vascular access
- Intubation or insertion of supraglottic airway device
- Utilize $EtCO_2$ as soon as possible

↓

EPINEPHRINE 1.0 mg IV/IO every 3-5 min

- Defibrillate
- 2 min CPR

↓

If VF/pVT

AMIODARONE 300 mg IV/IO, may repeat at 150 mg in 3-5 min, for sustained VF, pVT

OR

LIDOCAINE 1.0-1.5 mg/kg IV/IO, followed by 0.5-0.75 mg/kg IV/IO every 5 min to 3 mg/kg max

If the patient converts to a perfusing rhythm after administration of LIDOCAINE, start LIDOCAINE infusion at 2-4 mg/min IV/IO

If TdP

MAGNESIUM SULFATE 2 gm IV/IO over 5 min

Asystole/PEA

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- Obtain vascular access
- Intubation or insertion of supraglottic airway device
- Utilize $EtCO_2$ as soon as possible

↓

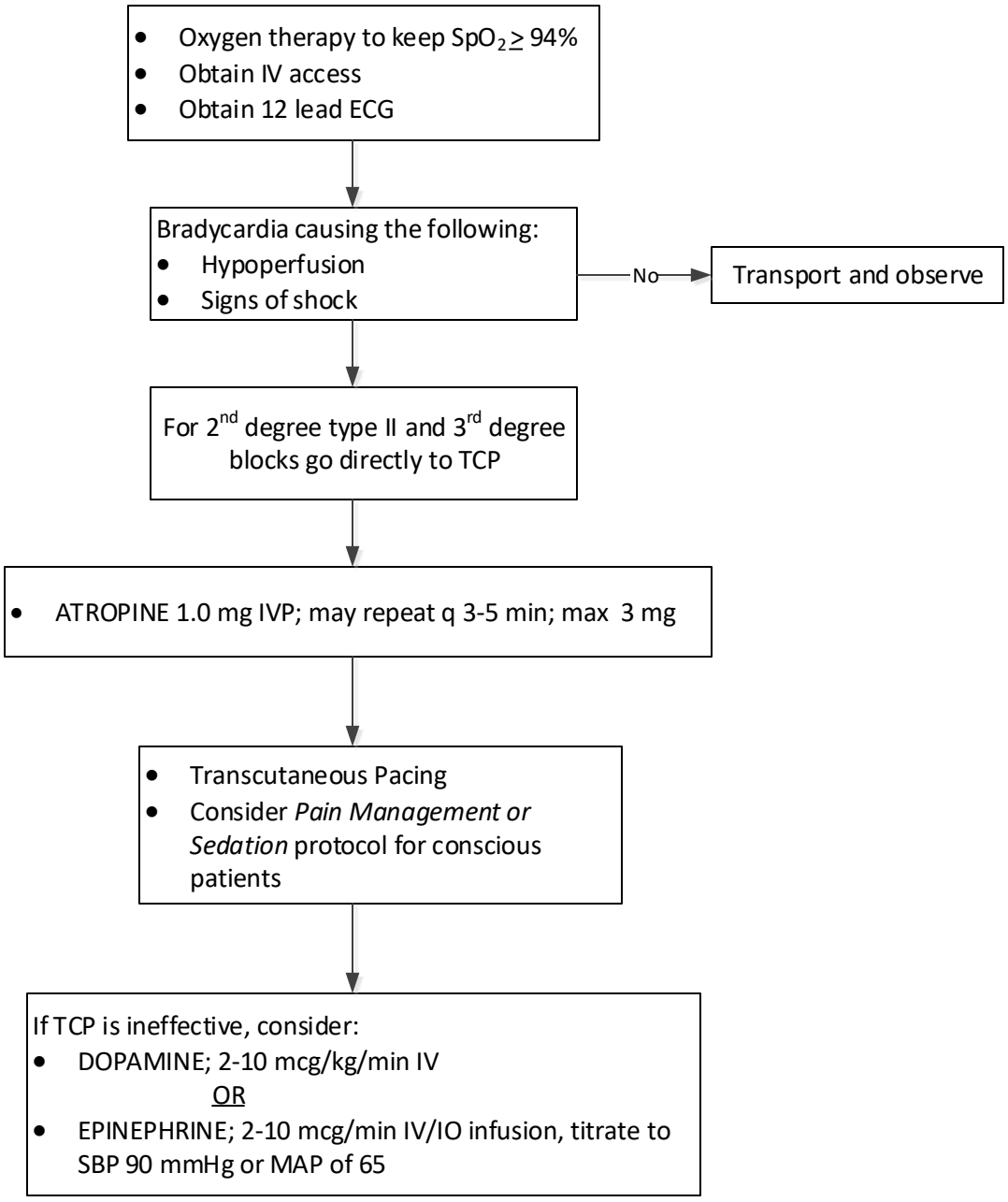
EPINEPHRINE 1.0 mg IV/IO every 3-5 min

- Check pulse if organized rhythm
- Consider consultation of **Medical Control** for termination of efforts
- Minimum of 3 rounds of medication are required prior to contact

Pearls:

- Joule settings for defibrillation are 120J/150J/200J.
- EPINEPHRINE dose via ETT is 2.5 mg 1:1,000, diluted in 10 mL NS.
- LIDOCAINE dose via ETT is 3 mg/kg x 2.
- Routine use of LIDOCAINE is not recommended.
- Prophylactic use of post conversion AMIODARONE is not recommended.
- For sustained TdP post MAGNESIUM SULFATE administration, continue with AMIODARONE as indicated.
- Use caution when administering two or more ventricular antidysrhythmics , as it may have a proarrhythmic effect.

Cardiac - Bradycardia

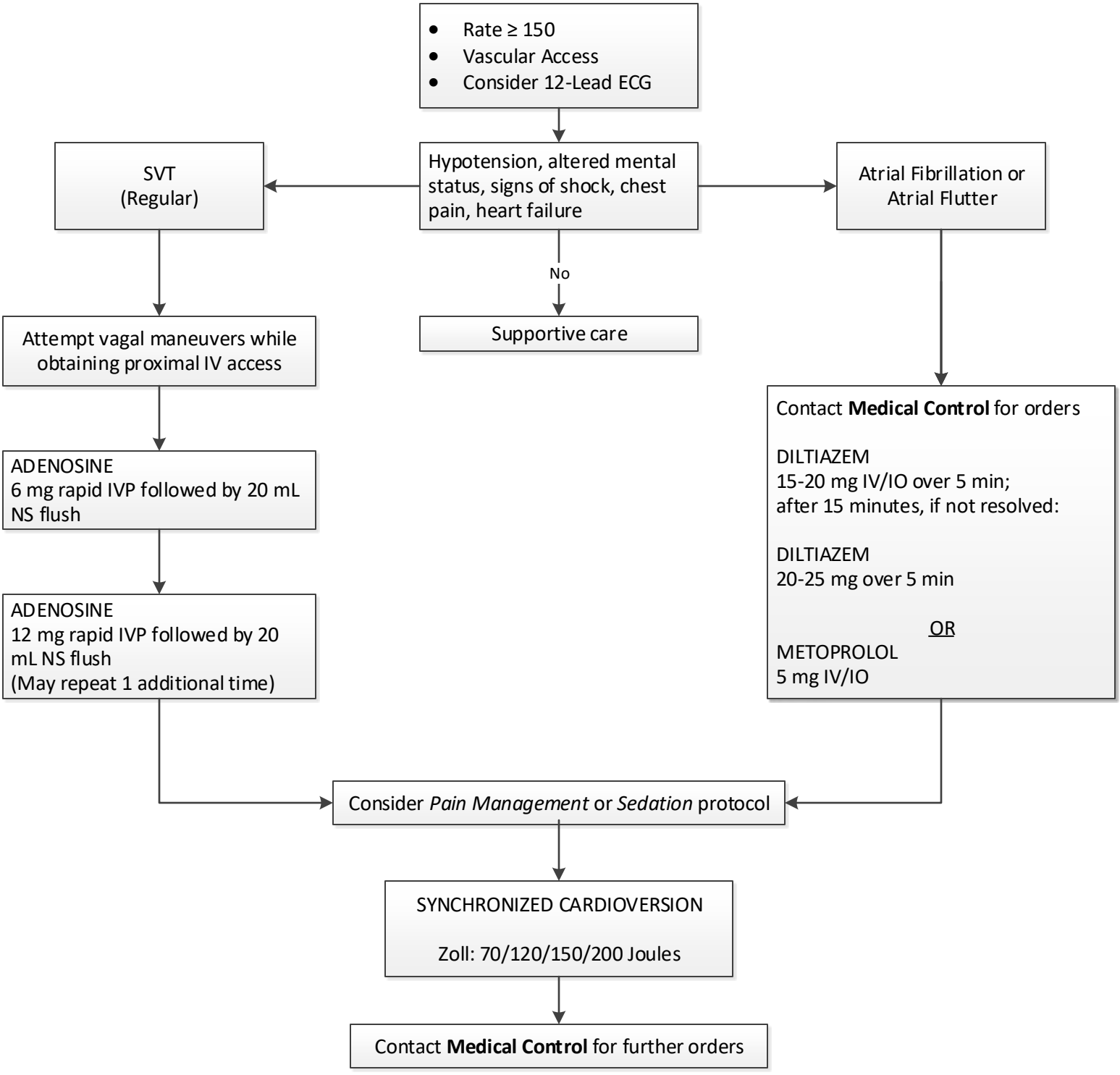


Pearls:

- **M**ean **A**rterial **P**ressure (**MAP**): MAP = ((DBP x 2) + SBP)/ 3.
- ATROPINE administration should not delay TCP in patients with poor perfusion.
- ATROPINE is contraindicated in the presence of acute coronary ischemia or MI.
- Consider calling **Medical Control** for GLUCAGON for patients with suspected beta blocker or calcium channel blocker overdose.
- Consider calling **Medical Control** for CALCIUM CHLORIDE for patients with suspected calcium channel blocker overdose.
- Repeat 12-lead ECG for evolving STEMI.
- Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.
- Signs and symptoms of bradycardia may be mild and are typically < 50 BPM.
- Do not delay pacing while waiting for IV access.
- Hypoxemia is a common cause of bradycardia; be sure to oxygenate the patient and provide ventilation support as needed.

Cardiac - Narrow Complex Tachycardia w/Pulses

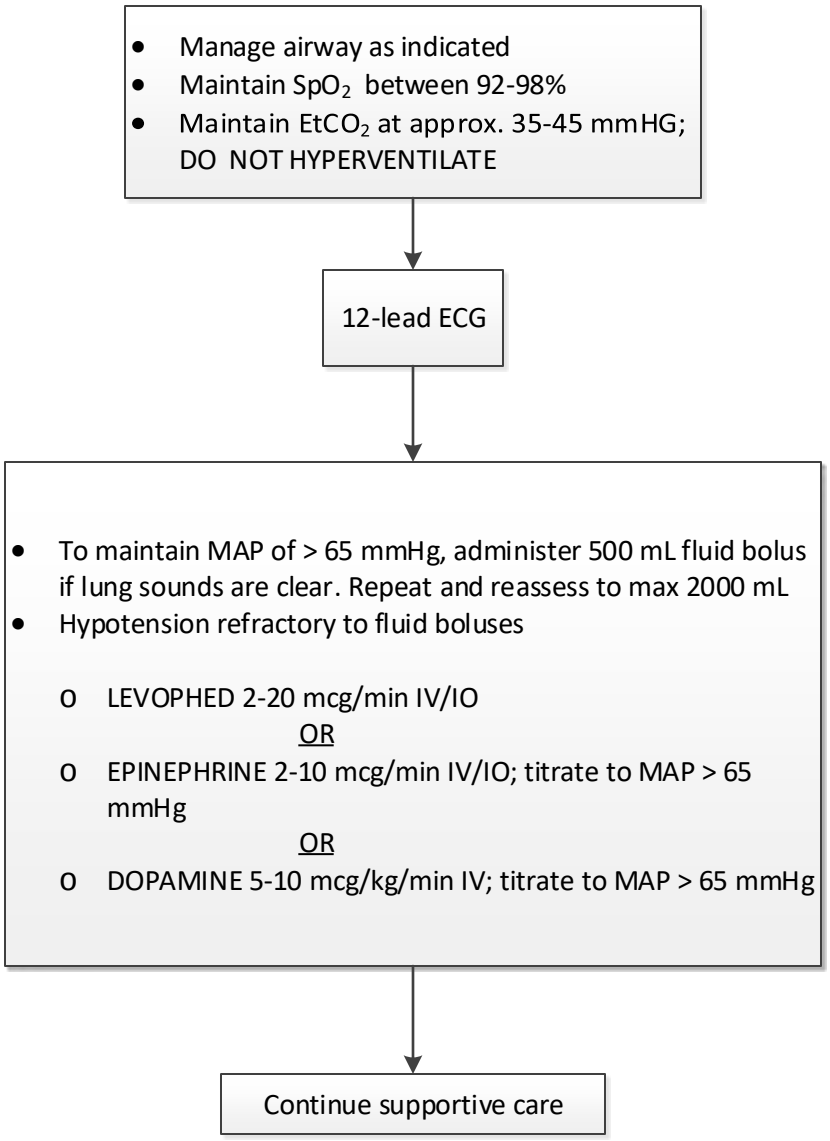
Washoe County Regional Protocols



Pearls:

- Should consider DILTIAZEM maintenance infusion 5-15 mg/hr titrated to heart rate when contacting **Medical Control**.
- Determining onset of atrial fibrillation or atrial flutter guides treatment options when contacting **Medical Control**.
- May go directly to cardioversion at any time if severely symptomatic or patient deteriorating.

Cardiac - Post Arrest Care

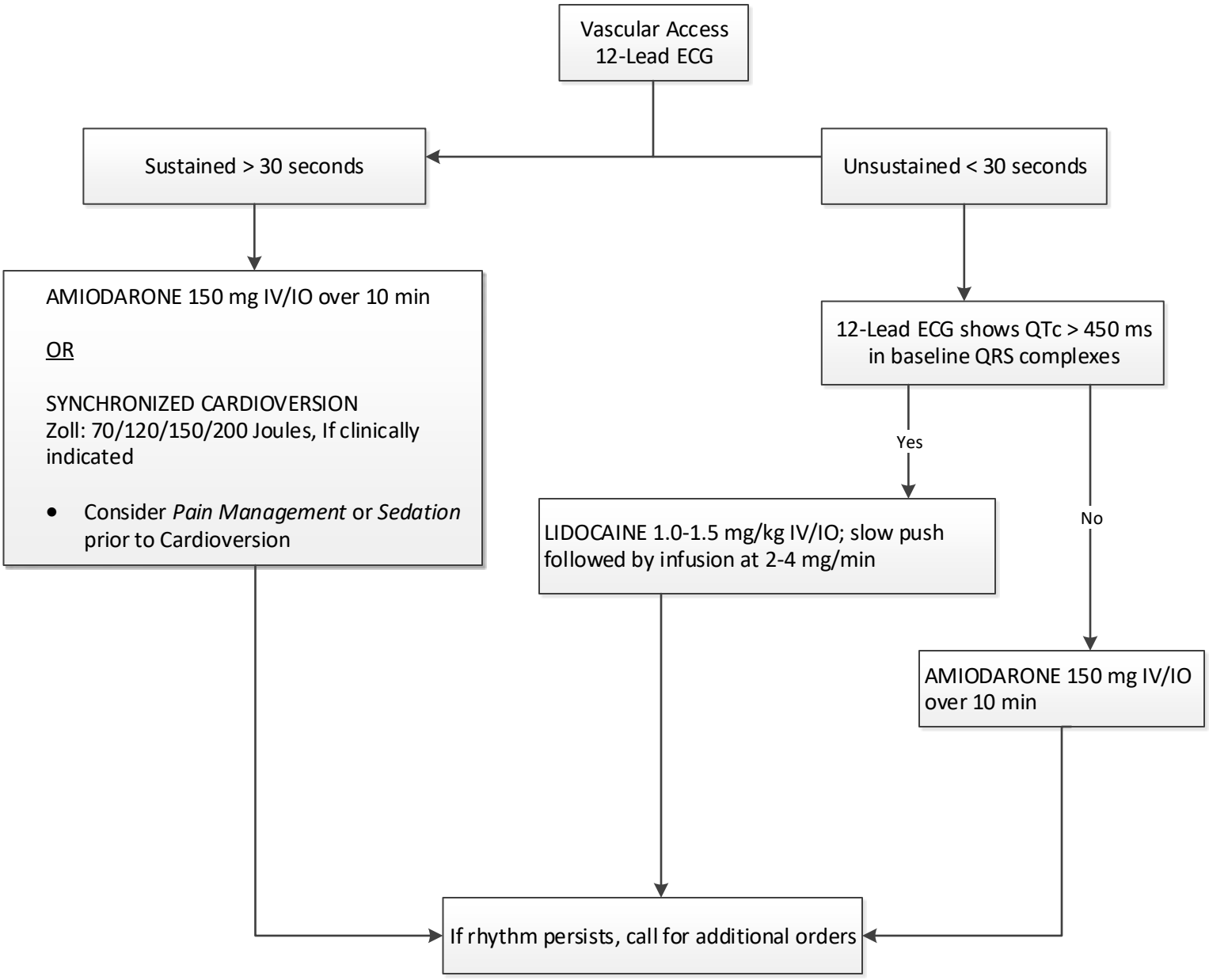


Pearls:

- **M**ean **A**rterial **P**ressure (**MAP**): MAP = ((DBP x 2) + SBP)/ 3.
- Do not cool post traumatic arrest or pregnant patients.
- Initial $EtCO_2$ may be elevated immediately post resuscitation but will normalize.
- If ROSC in previously hypothermic patient (core temp < 93°F or 34°C), refer to *Hypothermia/Cold Emergency* protocol.
- Use caution in treating immediate post arrest arrhythmias, as they may resolve spontaneously.
- All post arrest patients, excluding trauma, should be transported to nearest PCI capable facility.

Cardiac - Wide Complex Tachycardia with Pulses

Washoe County Regional Protocols



Pearls:

- If patient is hemodynamically unstable, consider Cardioversion as primary treatment.
- For Torsades de Pointes, 2g MAGNESIUM SULFATE diluted in NS IV/IO, over 5 min.
- Consider ADENOSINE if regular, monomorphic, and undifferentiated.
- If cardioversion is successful prior to AMIODARONE administration with continued ventricular ectopy, consider AMIODARONE 150 mg IV/IO over 10 minutes.
- If suspected SVT with aberrancy, see *Narrow Complex Tachycardia* protocol.
- It is recommended not to mix antidysrhythmic medications during the course of patient treatment.
- Unsustained WCT can be considered frequent runs or salvos of WCT.

Childbirth/Labor/Obstetrical Emergency

Normal Presentation

- Puncture amniotic sac, if not already broken
- Deliver and support the head
- Suction mouth, then nose; if meconium present, repeat several times
- Deliver upper shoulder, then lower shoulder
- Deliver remainder of the baby
- Clamp and cut umbilical cord
- If multiple births, repeat steps
- Deliver placenta

Breech Presentation

- Position patient on elbows and knees with hips elevated
- Support body of baby during delivery of head
- If head does not deliver but body is out, insert gloved hand into vagina and form a 'V' to protects baby's airway from vaginal wall

Cord Presentation

- Position patient in position of comfort with pelvis elevated
- Wrap cord and keep it moist
- Insert gloved hand to lift baby off cord; obtain and document cord pulse

Limb Presentation

- Position patient in position of comfort with pelvis elevated

Nuchal Presentation

- Use palm of one hand to push against the motion of the infant and use the fingers of the other hand to unloop the cord from around the neck
- If you are unable to slip the cord around the head, clamp the cord in two places and gently cut the cord between the clamps
- Continue delivery

Uncontrolled Postpartum Hemorrhage

- Administer 500 mL NS; repeat as needed not to exceed 2000 mL
- Fundal massage
- OXYTOCIN IV infusion 20 units in 1000 mL NS; Give 10 units (500 mL) over 10-20 minutes, then maintenance infusion 2.5 units (125 mL) per hour

Pearls:

- Document all times (delivery, contraction duration and frequency).
- Some bleeding is normal; copious amounts of blood or free bleeding is abnormal.
- Record APGAR at **one** and **five** minutes after birth as a measure of overall cardiopulmonary and neurologic function.

Hyperglycemia/Hypoglycemia

- Establish baseline level of consciousness
- Manage the airway and breathing as indicated by the patient's condition
- Consider possible reversible causes prior to placement of an advanced airway
- Consider cardiac monitor and 12-Lead ECG

If BGL is < 60 mg/dl:

- Consider ORAL GLUCOSE if the patient is alert/ able to protect their own airway
- Establish IV access as applicable
- 12.5-25 gm DEXTROSE D50% IV/IO, reassess/ repeat as needed

  AND/OR
- 125 mL DEXTROSE D10% IV/IO, reassess/ repeat as needed
- Titrate to achieve blood glucose of ≥ 60 mg/dl and/or level of consciousness
- Consider THIAMINE 100 mg slow IV/IM for chronic alcoholism/malnutrition
- If unable to obtain an IV, administer GLUCAGON 1 mg IM
- If GLUCAGON is ineffective, establish an IO
  - Administer 125 mL DEXTROSE D10% IO, reassess/repeat as needed

    OR
  - Administer 12.5-25 gm DEXTROSE D50% IO, reassess/repeat as needed
- Reassess BGL after each intervention as necessary

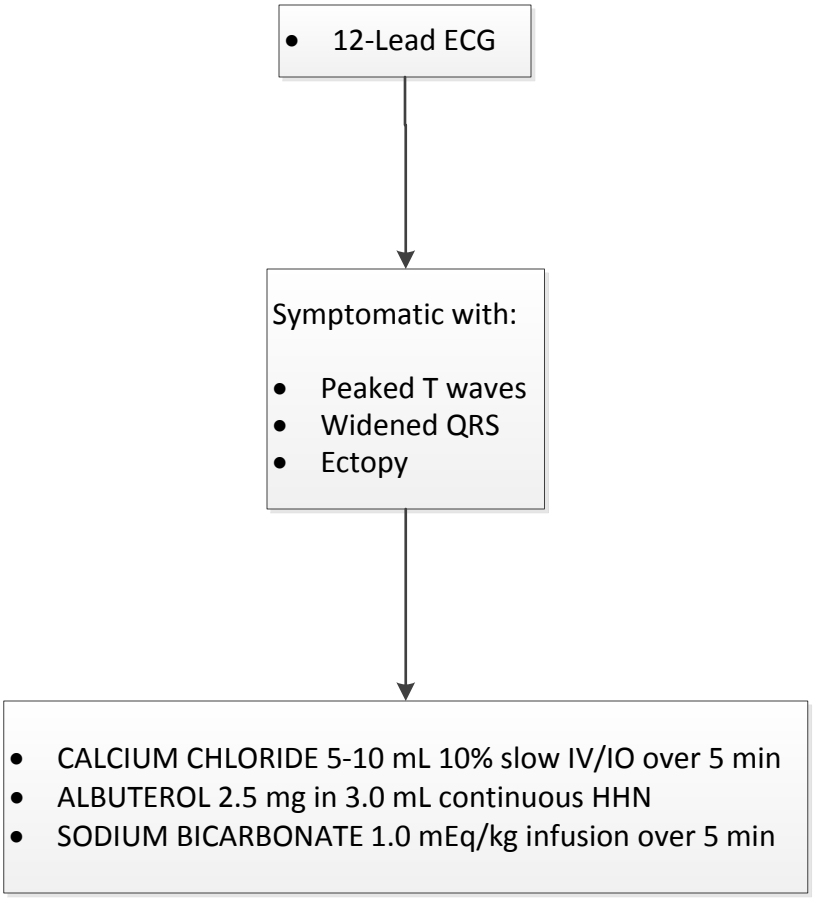
If BGL is > 250 mg/dl

- Consider Fluid bolus up to 20 mL/kg, reassess
- Consider monitoring $EtCO_2$

Pearls:

- Consider DKA or Hyperglycemic Hyperosmolar Syndrome on the patient that is a known person with diabetes and had a recent illness or injury.
- Lactated Ringers is the preferred fluid for hyperglycemic patients when DKA is suspected.

Hyperkalemia (Suspected)



Pearls:

- CALCIUM CHLORIDE is contraindicated in patients with suspected digitalis toxicity.
- Patients predisposed to hyperkalemia may include *Crush Injury*, chronic renal failure, and TCA overdoses.
- Hyperkalemia is defined as potassium level higher than 5.5 mmol/l.
- Potassium of 5.5 - < 6.0 mEq/L – Tall tented T waves.
- Potassium of 6.0 - < 6.5 mEq/L – Increasing PR and QT intervals.
- Potassium of 6.5 - < 7.0 mEq/L – Flattening of P waves and ST segments.
- Potassium of 7.0 - < 7.5 mEq/L – Widened QRS complexes.
- Potassium of 7.5 - < 8.0 mEq/L – Deepening S waves and merging of S and T waves.
- Potassium of 8.0 - < 10.0 mEq/L – Sinewave shaped complexes and idioventricular rhythm.
- Potassium of $\geq$ 10 mEq/L - PEA often sine wave in appearance, VF, VT and Asystole.

Hyperthermia/Heat Emergency

Heat Exhaustion

- Body temperature up to 104°F/40°C
- Minor CNS changes, weakness, dizziness, fainting
- Nausea, headache, dilated pupils, no appetite
- Skin clammy, pale and moist
- Muscle cramps/pain

Heat Stroke

- Body temperature 104°F/40°C or greater
- Altered mental status or loss of consciousness
- Convulsions, seizures
- Tachycardia, hypotension
- Skin (hot, red, dry)
- Severe vomiting or diarrhea

- Remove patient from hot environment and remove clothing
- Begin active cooling of patient with appropriate measures
- Consider cardiac monitor and attempt to obtain body temperature
- Consider vascular access

Treat signs and symptoms of shock as necessary

Treat seizures per the *Seizure* protocol

Pearls:

- Heat exhaustion can rapidly progress to heat stroke if untreated.
- Heat stroke requires very aggressive cooling.
- Active cooling includes application of cold packs (not directly on skin), fanning, air conditioner or air movement.
- Intense shivering may occur as patient is cooled, discontinue aggressive cooling methods.
- Sweating generally disappears as body temperatures rise over 104°F/40°C.
- Wet sheets without good airflow may increase body temperature.
- Patients predisposed to heat emergencies include:
  - Elderly or pediatric
  - Alcohol or drug use
  - Antidepressant, antipsychotics and antiepileptic medications
  - Diuretics, beta blockers or antihistamines

Hypothermia/Cold Emergency

Remove wet clothing and protect from environment

Localized cold injury

- Monitor and reassess
- General wound care
- DO NOT rub skin to warm
- DO NOT allow refreezing

Systemic hypothermia

- Monitor temperature
- Maintain supine position
- Avoid rough movement and excess activity
- Active warming measures
- Vascular access
- Cardiac monitor
- Consider warm NS bolus 500 mL IV/IO; repeat to effect SBP > 90 max 2L
- Monitor and reassess

Transport all severely hypothermic patients regardless of response to treatments. Follow appropriate protocols for other treatment/ transport decisions.

Patient with pulse	
Core Temperature	Treatment
93.2^{O}F – 96.8^{O}F	Passive re-warming and active external re-warming
86^{O}F – 93.2^{O}F	Passive re-warming and active external re-warming to trunk areas only

Patient without a pulse	
Start CPR, defibrillate once if indicated	
Core Temperature	Treatment
< 86^{O}F	CPR, withhold IV medications, limit to one shock for VF/VT/Torsades
> 86^{O}F	CPR, give IV medications at longer intervals, repeat defibrillation for VF/VT/Torsades, passive re-warming and active external re-warming to trunk areas only

Pearls:

- Extremes of age are more prone to cold emergencies.
- If temperature is unknown, treat the patient based on suspected temperature.
- For the severely hypothermic patient, perform procedures gently and monitor cardiac rhythm closely.
- Active warming includes hot packs that can be used on the armpit and groin; care should be taken not to place the packs directly on the skin.
- If available, core temperature is preferred.

Medication Assisted Intubation

- Pre-oxygenate patient
- Prepare equipment
- Cardiac monitor

If needed, for analgesia or attenuation of increased ICP:

- FENTANYL 1-3 mcg/kg IV/IO

Sedation and Induction:

- KETAMINE 1-3 mg/kg IV/IO
  OR
- MIDAZOLAM 2-10 mg IV/IO
  OR
- ETOMIDATE 0.3 mg/kg IV/IO, may repeat X 1 to a max total dose of 0.6 mg/kg

- As patient jaw relaxes, proceed with intubation
- Consider cricoid pressure (release if vomiting occurs)

If inadequate relaxation is present:

- If patient is not fully dissociated after KETAMINE, may repeat KETAMINE dose
- If KETAMINE was used and patient is fully dissociated, proceed to MIDAZOLAM 2-5 mg IV/IO
- MIDAZOLAM dose may be repeated at 2-5 mg IV/IO

Indications:

- To establish an emergency airway for patients who cannot provide or protect their own airway or maintain adequate gas exchange.

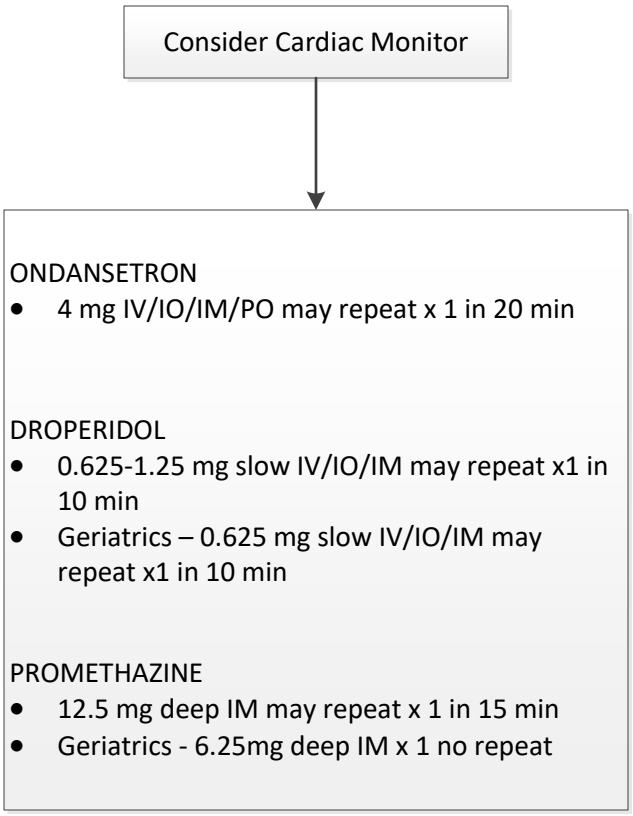
Contraindications:

- Upper *Airway Obstruction*
- Tracheal obstruction (foreign body, tumor)
- Suspected pharyngeal infection (epiglottitis, peritonsilar, or retropharyngeal abscess)

Pearls:

- Pharmacological agents are used to assist the provider in performing intubation in patients with high intubation difficulty due to excessive gag reflex. In these instances, protecting the airway is a potentially life-saving maneuver. These patients may include: Isolated *Head Trauma*, *CVA/Stroke*, *Multisystem Trauma*, *Overdose*, Status Epilepticus, *Acute Pulmonary Edema*, *Respiratory Failure*, *Severe Burns*, or based on anticipated clinical course.
- This should only be used when other airway control methods are ineffective or contraindicated.
- If using KETAMINE, consider MIDAZOLAM to prevent reemergence phenomenon.
- Reserve ETOMIDATE for non-septic, non-pediatric patients, and/or for those with suspected head injury.

Nausea/Vomiting



Pearls:

- Consider cardiac origin and perform a 12-Lead ECG.
- Avoid DROPERIDOL for patients presenting with suspected MI, ACS, or uncorrected hypotension
- Do NOT co-administer DROPERIDOL and PROMETHAZINE
- Use antiemetics with caution in patients with a known history of prolonged QT interval. In general, prolonged QT is defined as a QTc > 450 ms.

Overdose/Poisoning

Poison Control - (800) 222-1222 OR (775) 982-4129

- Determine cause of overdose/poisoning, treat as appropriate
- Cardiac Monitor

Carbon monoxide (CO)

- Place patient on CO monitor, do not rely on pulse oximeter readings
- If patient's SpCO is:
  - 0 – 5 % - Considered normal for non-smokers. When > 3% with symptoms, consider high flow oxygen and recommend transport. If asymptomatic, no further medical evaluation necessary of SpCO. Counsel patients on signs and symptoms to watch for, offer transport to ED, if refused, complete AMA.
  - 5 – 10 % - Considered normal for smokers, abnormal for non-smokers. If symptoms are present, consider high flow oxygen and recommend transport to ED.
  - 10 – 15 % - Abnormal in any patient. Assess for symptoms, consider high flow oxygen and recommend transport to ED.
  - > 15 % - Significantly abnormal in any patient. Administer high flow oxygen and recommend transport to ED.
  - > 30 % - Consider transport/referral to hyperbaric facility (consider referral to hyperbaric facility if > 25% for patients with ALOC or pregnant).
- If patient has altered LOC, neurological impairment, or > 25% SpCO, treat with 100% O_2 and transport to nearest appropriate facility
- Continue supportive therapies as needed

Opiates

- Titrate NALOXONE to restore adequate respirations
  - 0.5 - 2 mg IV/IO/IM/IN may repeat to max total dose of 10 mg

Tricyclic Anti-Depressants

For patients with any of the following:
- Dysrhythmias or QRS of $\geq$ 120 ms
- Hypotension
- Seizure
- Cardiac Arrest

- Administer SODIUM BICARBONATE 1.0 mEq/kg IV immediately call for orders for additional dose
- If patient is intubated, ventilate patient to maintain $EtCO_2$ level of 28-30 mmHg

Organophosphate Poisoning (Insecticide)

- ATROPINE 1-2 mg every 3-5 minutes until cessation of secretions

Agents:

- ACETAMINOPHEN: Initially normal or N/V. Tachypnea and AMS may occur later. Renal dysfunction, liver failure and/or cerebral edema may manifest.
- **Beta blocker overdose**: call for possible administration of GLUCAGON.
- **Calcium channel blocker**: call for possible administration of CALCIUM CHLORIDE and/or GLUCAGON.
- Depressants: Decreased HR, BP, temp and RR.
- Anticholinergic: Increased HR, increased temperature, dilated pupils and AMS changes.
- Insecticides: May include S/S of organophosphate poisoning.
- Solvents: N/V, cough, AMS.
- Stimulants: Increased HR, BP, temperature, dilated pupils, seizures, and possible violence.
- TCA: Decreased mental status, dysrhythmias, seizures, hypotension, coma, death.

Poison Control - (800) 222-1222 OR (775) 982-4129

Cyanide Exposure

For known cyanide poisoning in the absence of exposure to smoke, refer to the cyanide antidote parameters contained within the *Smoke Inhalation* protocol

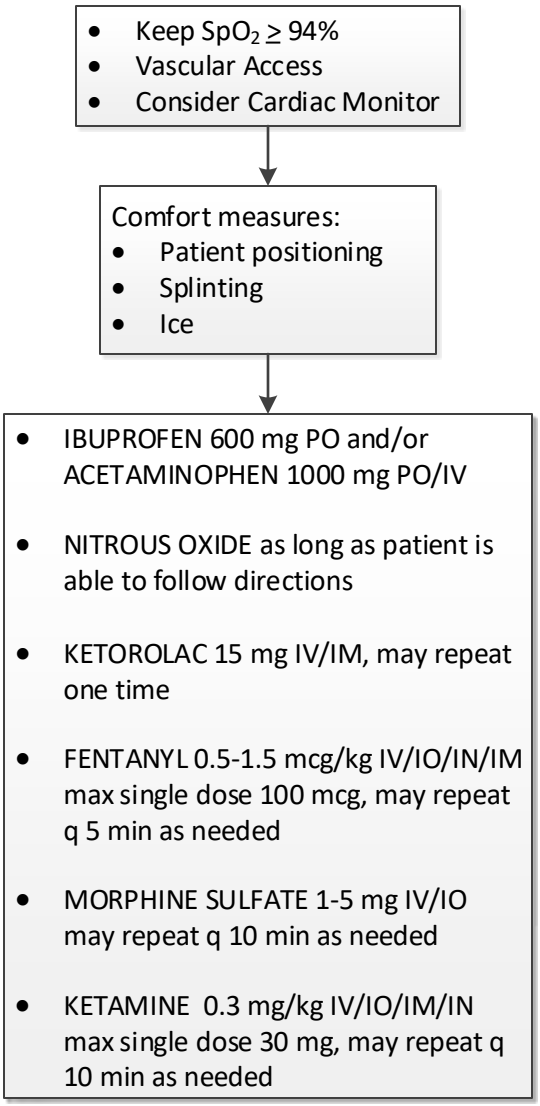
Pearls:

- Powdered HYDROXOCOBALAMIN will be reconstituted with 200 cc 0.9% NS or lactated ringers. Repeatedly invert for 60 seconds PRIOR TO administration. Do Not Shake.
- CALCIUM CHLORIDE is contraindicated in patients with suspected digitalis toxicity.
- If patient is suspected to have narcotic overdose/hypoglycemia, administer NALOXONE/GLUCOSE prior to BIAD device/ intubation.
- Consider a second line if possible for administration and avoidance of possible medication incompatibilities.
- For suspected ingestion, consider NG tube placement.
- Cyanide toxicity should be suspected for any patient being treated for Carbon Monoxide toxicity from smoke inhalation. Conscious patients with symptoms will require **Medical Control** contact prior to administration.
- Overdose or toxin patients with significant ingestion/exposure should be closely monitored and aggressively treated. Do not hesitate to contact **Medical Control** if needed.
- In the case of cyanide poisoning, altered mental status may be profound. Profound altered mental status can be defined as a deficit that includes disorientation, bewilderment and difficulty following commands.

Pain Management

Washoe County Regional Protocols

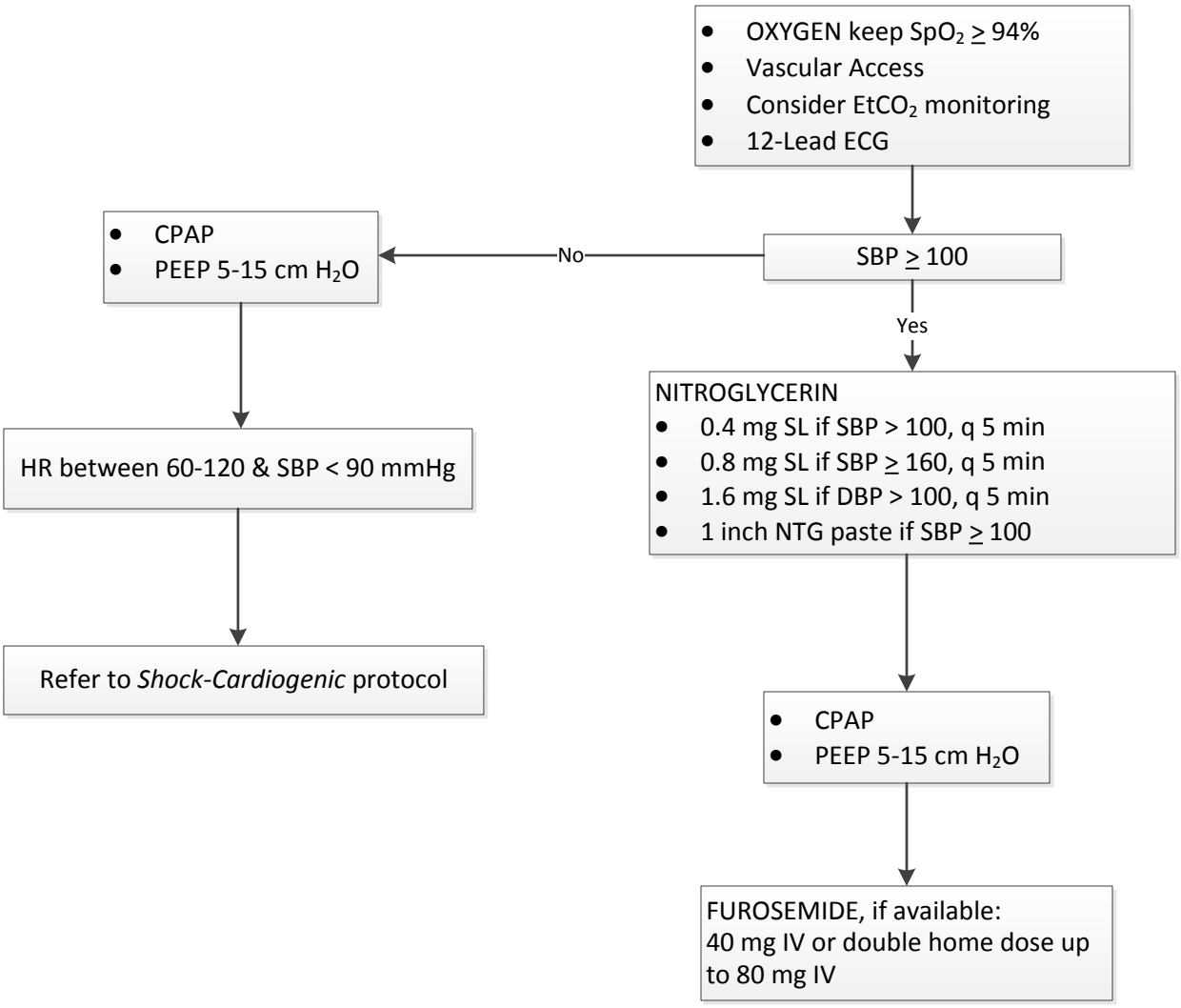
Assess and document patient's condition and vital signs before and after treatment (at minimum every 15 minutes). Pain should be assessed using a combination of physiologic indicators, including but not limited to, 1-10 pain scale and Richmond Agitation & Sedation Scale.



Pearls:

- KETAMINE is inadvisable in those with evidence of head trauma, traumatic mechanism with high likelihood of head trauma or patients with potential acute intracranial pathology otherwise (intracranial hemorrhage, CVA).
- Consider KETAMINE if patient is hypotensive.
- KETOROLAC is contraindicated in patients with kidney or liver disease, head injury, Hx of or recent internal bleeding (bleeding disorder or ulcers), taking blood thinners, recent surgery or is a surgical candidate, is or may be pregnant, or breastfeeding. Do not administer to elderly patients (over 65 years of age).
- Strongly consider alternative agents to KETAMINE for patients with a suspected head injury.
- Consider prophylactic ONDANSETRON use when administering pain medication.
- When administering pain medications to patients with a higher potential for adverse reaction (elderly, intoxicated, opiates or depressants already on board, etc.) use caution and consider the need for a lower starting dose to achieve the desired effect.
- Ophthalmic anesthetics may be used for ocular injuries, 1-2 drops, as needed.

Pulmonary Edema



Pearls:

- Avoid administering NITROGLYCERIN to any patient who is currently using phosphodiesterase inhibitors.
- Consider NITROGLYCERIN PASTE for subsequent doses after placing CPAP mask (i.e. do not remove mask to administer SL doses).
- Allow patient to dangle legs, if possible.

Respiratory Distress

- Cardiac monitor
- Consider 12-lead ECG
- SpO_2 and $EtCO_2$ monitoring

Asthma/reactive airway disease

- ALBUTEROL 2.5 mg in 3.0 mL HHN; repeat until improvement
- DUONEB 2nd & 3rd HHN **additional HHNs use ALBUTEROL
- Consider CPAP

- Impending Respiratory Failure:
- EPINEPHRINE
  - 0.3 – 0.5 mg (0.3 – 0.5 mL) IM 1:1,000
  - 0.1 mg IV 1:10,000 repeat as needed, max 0.3 mg
- METHYLPREDNISOLONE 125 mg IV/IO
- MAGNESIUM SULFATE 2 gm IV over 20 min

Chronic lung disease with deterioration

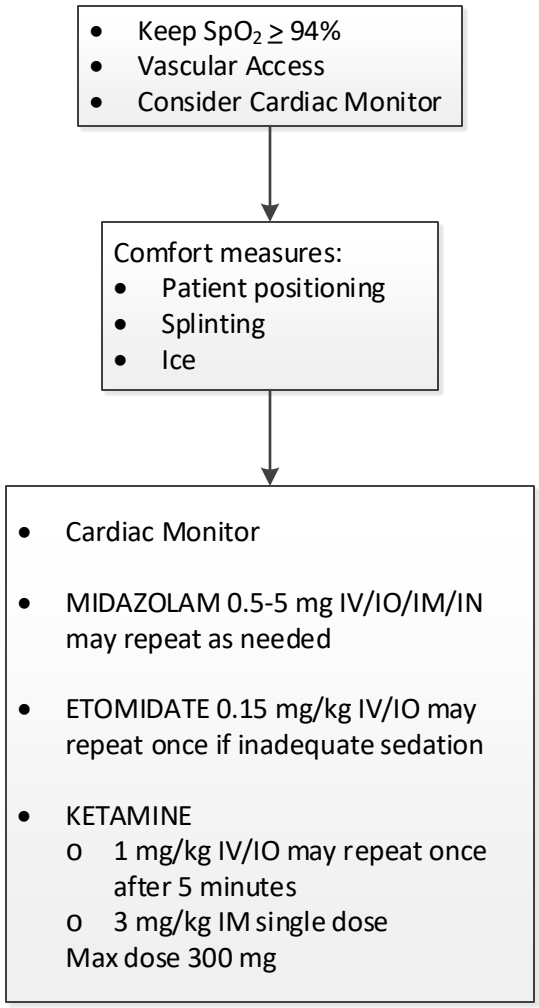
- ALBUTEROL 2.5 mg in 3.0 mL HHN; repeat until improvement
- DUONEB 2nd & 3rd HHN **additional HHNs use ALBUTEROL
- Consider CPAP
- METHYLPREDNISOLONE 125 mg IV/IO

Pearls:

- Duoneb equivalent can be achieved by combining 0.5 mg IPRATROPRIUM in 2.5 mg ALBUTEROL.
- Signs of impending respiratory failure include: altered mental status, inability to maintain respiratory effort, cyanosis.
- If patient > 45 years or previous cardiac history, consider contacting **Medical Control.**

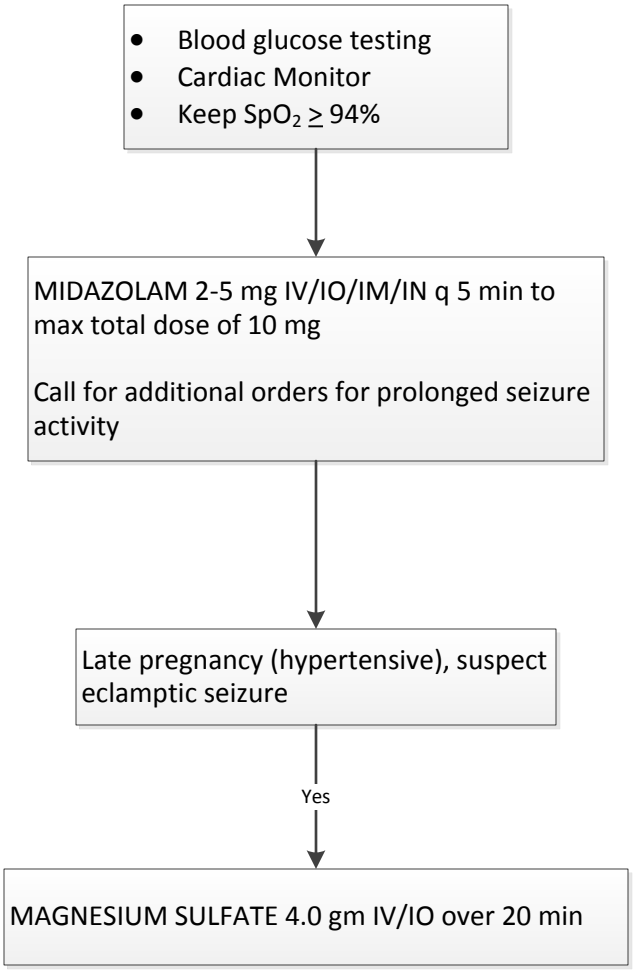
Sedation

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 Richmond Agitation & Sedation Scale.



Pearls:

- KETAMINE is inadvisable in those with evidence of head trauma, traumatic mechanism with high likelihood of head trauma or patients with potential acute intracranial pathology otherwise (intracranial hemorrhage, CVA).
- Consider KETAMINE if patient is hypotensive.
- Strongly consider alternative agents to KETAMINE for patients with a suspected head injury.
- When administering sedation medications to patients with a higher potential for adverse reaction (elderly, intoxicated, opiates or depressants already on board, etc.) use caution and consider the need for a lower starting dose to achieve the desired effect.



Pearls:

- **Eclamptic seizure/ob patients** showing signs of Magnesium Sulfate toxicity (respiratory depression, hypotension or bradycardia):
  - Consider administering 5 mL 10% Calcium Chloride slow IV/IO push over 5 minutes.
- Benzodiazepines are effective in terminating seizures; do not delay IM/IN administration while initiating an IV.
- Status epilepticus is defined as two or more seizures successively without an intervening lucid period, or a seizure lasting over five minutes.
- Consider $EtCO_2$ monitoring.

Sepsis

Suspect Sepsis if suspected infection and 2 or more of the following:

- Temperature > 100.4°F or < 96.8°F
- Respiratory rate > 20
- Heart rate > 90

Suspect Severe Sepsis if one of the following in addition to the above:

- Acute Hypoglycemia or Hyperglycemia
- Systolic BP < 90 mmHg or Mean Arterial Pressure (MAP) < 65 mmHg
- $EtCO_2$ < 25 mmHg

- Keep $SpO_2 \geq 94\%$
- Vascular access-Large bore IV preferred, obtain two if possible
- Cardiac Monitor
- Consider $EtCO_2$ monitoring
- Obtain Blood Glucose Level
- Follow Advanced Airway Management as indicated by patient's condition
- Place patient supine and elevate legs if possible
- Assess lung sounds
  - If clear, administer 30 mL/kg fluid bolus to max of 3000 mL
  - Reassess lung sounds after each 500 mL given
  - LR is preferred

If unable to maintain SBP > 90 mmHg or MAP > 65 mmHg, following fluid administration:

LEVOPHED 2-20 mcg/min IV/IO infusion titrate to MAP > 65 mmHg

OR

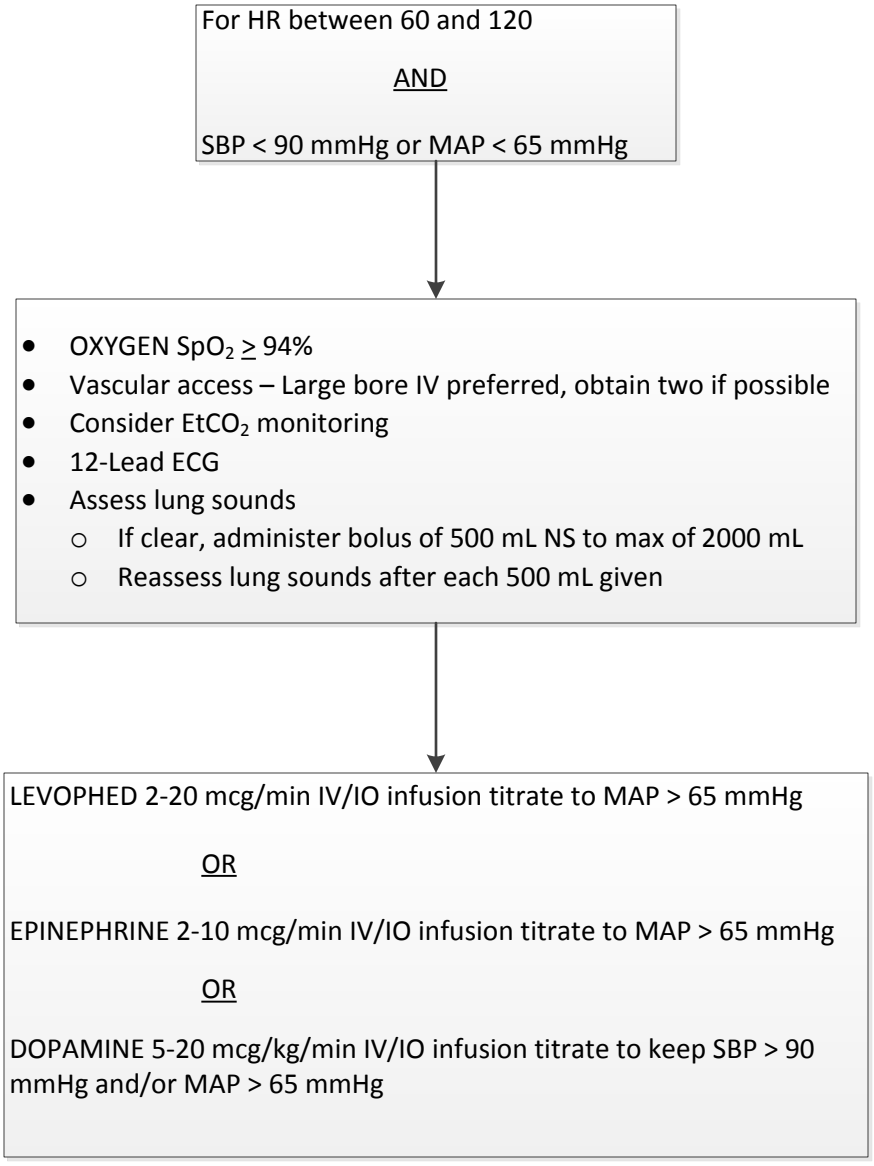
EPINEPHRINE Infusion 2-10 mcg/min IV/IO infusion; titrate to keep SBP > 90 mmHg

- Blood pressure assessed every 5 min while titrating EPINEPHRINE infusion to maintain MAP > 65 mmHg or systolic blood pressure of > 90 mmHg
- Monitor ECG continuously

Pearls:

- Hypotension can be defined as a SBP of < 90 mmHg or MAP < 65 mmHg. This is not always reliable and should be interpreted in context and patient's typical BP, if known.
- Shock may be present with a normal BP initially.
- Mean Arterial Pressure (MAP): MAP = ((DBP x 2) + SBP)/3.
- ACETAMINOPHEN 1gm PO for fever.

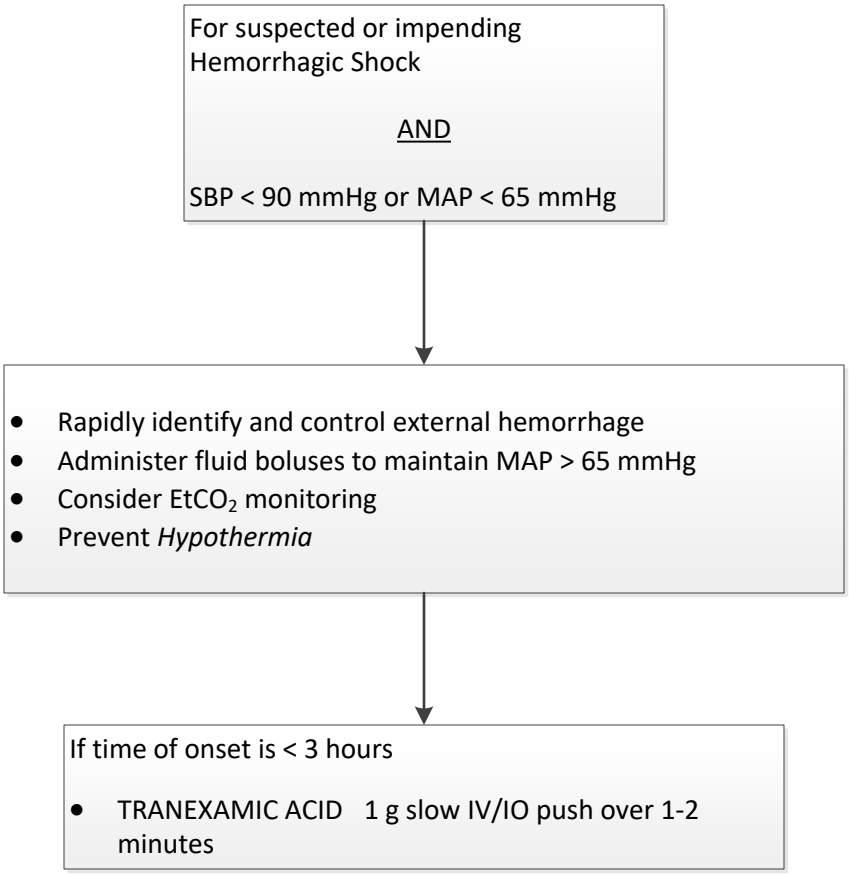
Shock – Cardiogenic



Pearls:

- Hypotension can be defined as a SBP of < 90 mmHg or MAP < 65 mmHg. This is not always reliable and should be interpreted in context and patient's typical BP, if known.
- Shock may present with a normal BP initially.
- Mean Arterial Pressure (MAP): MAP = ((DBP x 2) + SBP) / 3.

Shock – Hemorrhagic



Pearls:

- If unable to establish IV access, consider TRANEXAMIC ACID IM in 2 doses in 2 separate locations.
- Hypotension can be defined as a SBP of < 90 mmHg or MAP < 65 mmHg. This is not always reliable and should be interpreted in the context of the patient's typical BP, if known.
- Shock may present with a normal BP initially.
- Mean Arterial Pressure (MAP): MAP = ((DBP x 2) + SBP) / 3.
- For suspected pelvis injury, secure with circumferential compression or commercial device.
- Causes of massive hemorrhage may include, but are not limited to, trauma, postpartum hemorrhage, GI bleeding and esophageal varices.

Smoke Inhalation

Individuals may present with soot around nose and mouth after exposure to smoke from a structure fire or other sources (vehicle fire, industrial gases, confined spaces, etc.)

- Keep $SpO_2 \geq 94\%$
- Ventilation management
- Cardiac monitor

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- Vascular Access
- NS bolus 500 mL up to max 2000 mL for hypoperfusion

↓

Other treatment protocols as indicated

If the patient presents with cardiac arrest, hypotension, altered mental status or other signs and symptoms consistent with Cyanide (CN) poisoning, administer:

HYDROXOCOBALAMIN 5.0 g IV over 15 min

* Depending on the severity of the poisoning and the patient's response, a second dose of 5.0 g may be administered by IV infusion up to a total dose of 10.0 g. The rate of infusion for a second dose may range from 15 min (for patients in extremis) to 2 hours, as clinically indicated.

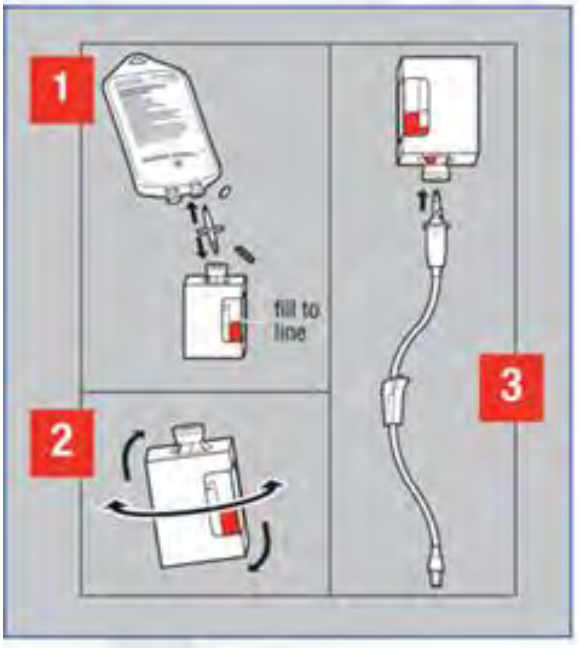
Complete Starting Dose: 5 g

1. **Reconstitute:** Place the vial in an upright position. Add 200 mL of 0.9% Sodium Chloride injection* to the vial using the transfer spike. **Fill to the line.**

   *0.9% Sodium Chloride injection is the recommended diluent (diluent not included in the kit). Lactated Ringers injection and 5% Dextrose injection have also been found to be compatible with hydroxocobalamin and may be used if 0.9% Sodium Chloride is not readily available

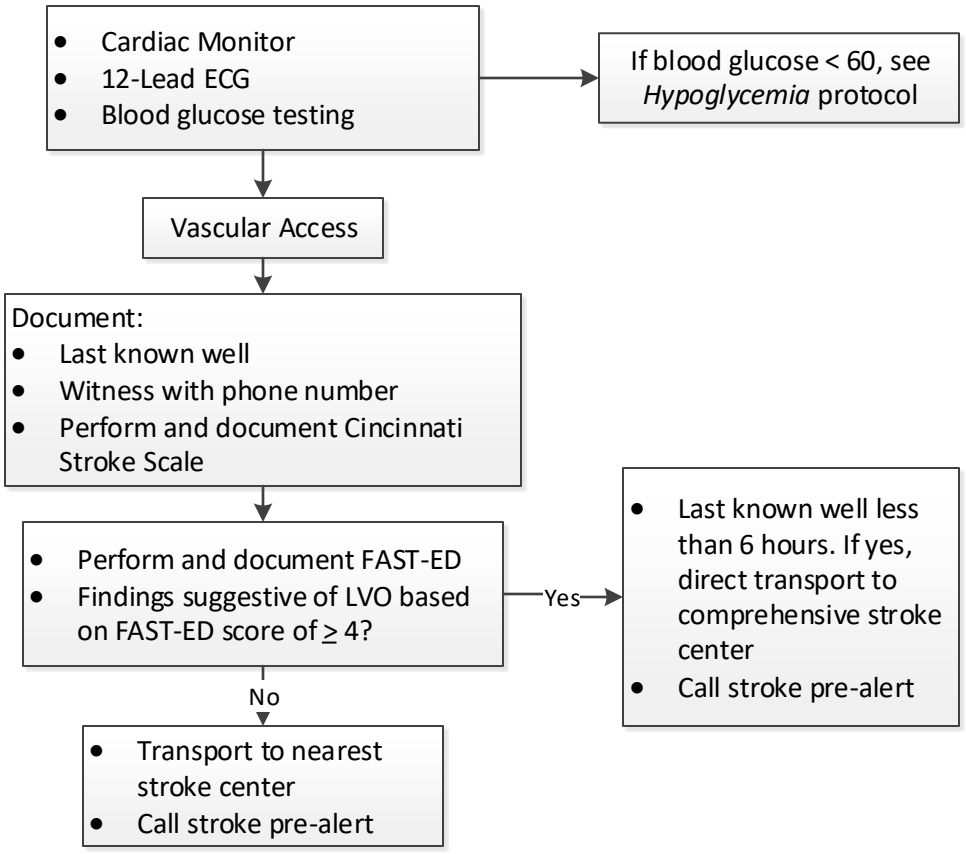
2. **Mix:** The vial should be repeatedly inverted or rocked, not shaken, for at least **60 seconds** prior to infusion.
   - CYANOKIT solutions should be visually inspected for particulate matter and color prior to administration
     - Discard solution if particulate matter is present or solution is not dark red

3. **Infuse Vial:** Use vented intravenous tubing, hang and infuse over **15 minutes.**



Pearls:

- Signs and symptoms consistent with Cyanide (CN) poisoning include:
  - Weakness, dizziness, headache, stupor, dilated pupils, dyspnea
  - Tachypnea, tachycardia, nausea, vomiting, tightness in the chest
  - Altered LOC, cardiovascular collapse, combativeness, confusion
  - Plasma Lactate concentration ≥ 8 mmol/L
  - Late signs: Cardiac arrest, apnea, bradypnea, hypotension, seizures
- Low $EtCO_2$ can be indicative of an elevated serum lactate level (less than 25).
- If the medication is not available on scene do not delay transport waiting for it.
- Decide early on if you want to intubate as burned airways swell, making intubation difficult.



FAST-ED Stroke Score

Item	FAST-ED Score	NIHSS Score Equivalence
Facial Palsy		
Normal or minor paralysis	0	0-1
Partial or complete paralysis	1	2-3
Arm Weakness		
No drift	0	0
Drift or some effort against gravity	1	1-2
No effort against gravity or no movement	2	3-4
Speech Changes		
Absent	0	0
Mild to moderate	1	1
Severe, global aphasia, or mute	2	2-3
Eye Deviation		
Absent	0	0
Partial	1	1
Forced deviation	2	2
Denial/Neglect		
Absent	0	0
Extinction to bilateral simultaneous stimulation in only 1 sensory modality	1	1
Does not recognize own hand or orients only to one side of the body	2	2

Stroke Pre-Alert Criteria

Indication	Contraindication
✓ Positive Stroke Assessment	✗ Stroke or head trauma in last 3 months
✓ ≥ 18 Years Old	✗ Recent intracranial or intraspinal surgery in last 3 months
✓ Within last 6 hours onset of "last seen well"	✗ Major surgery in past 2 weeks
	✗ Active bleeding

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PEDIATRIC TREATMENT PROTOCOLS

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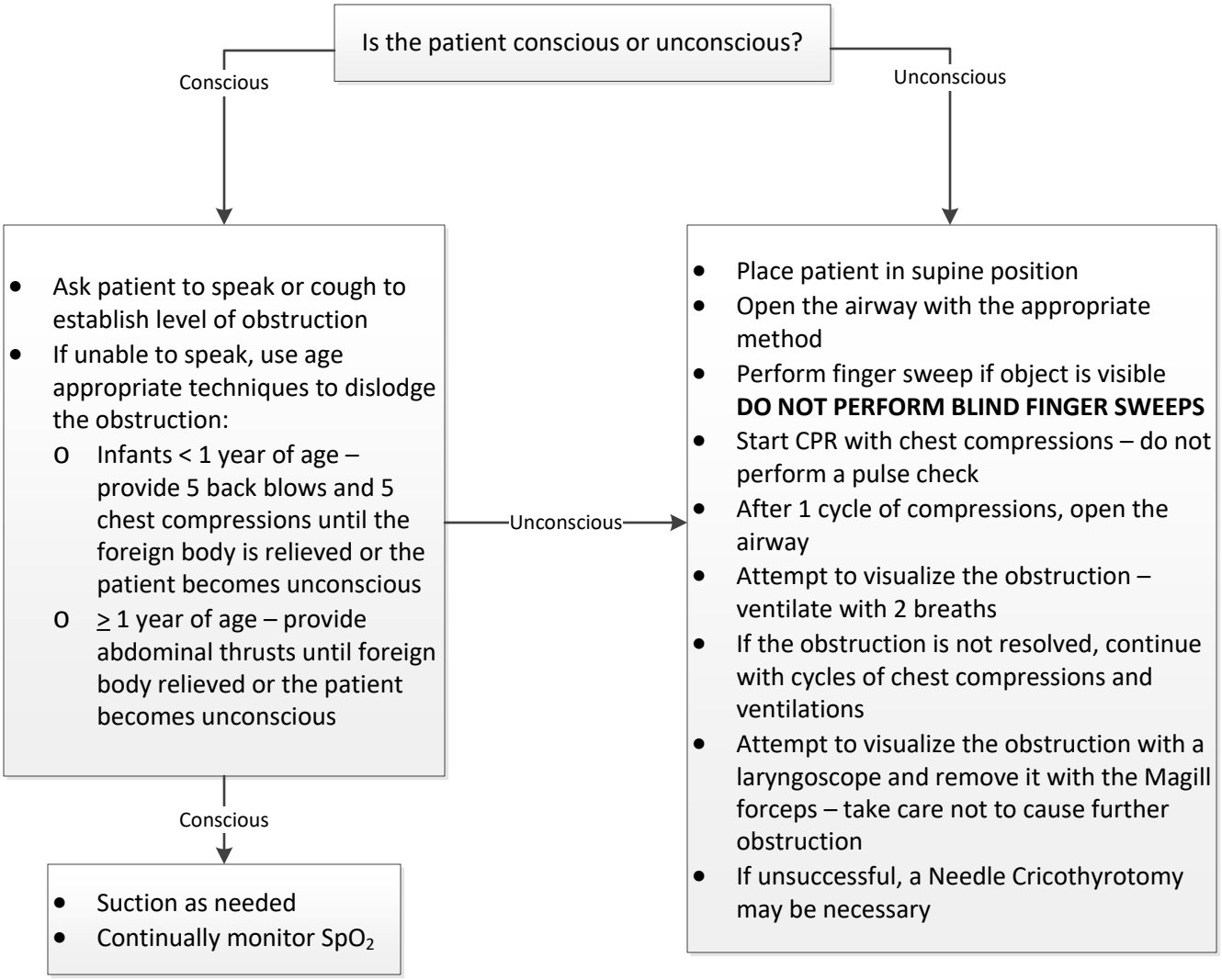
Pediatric Airway Obstruction



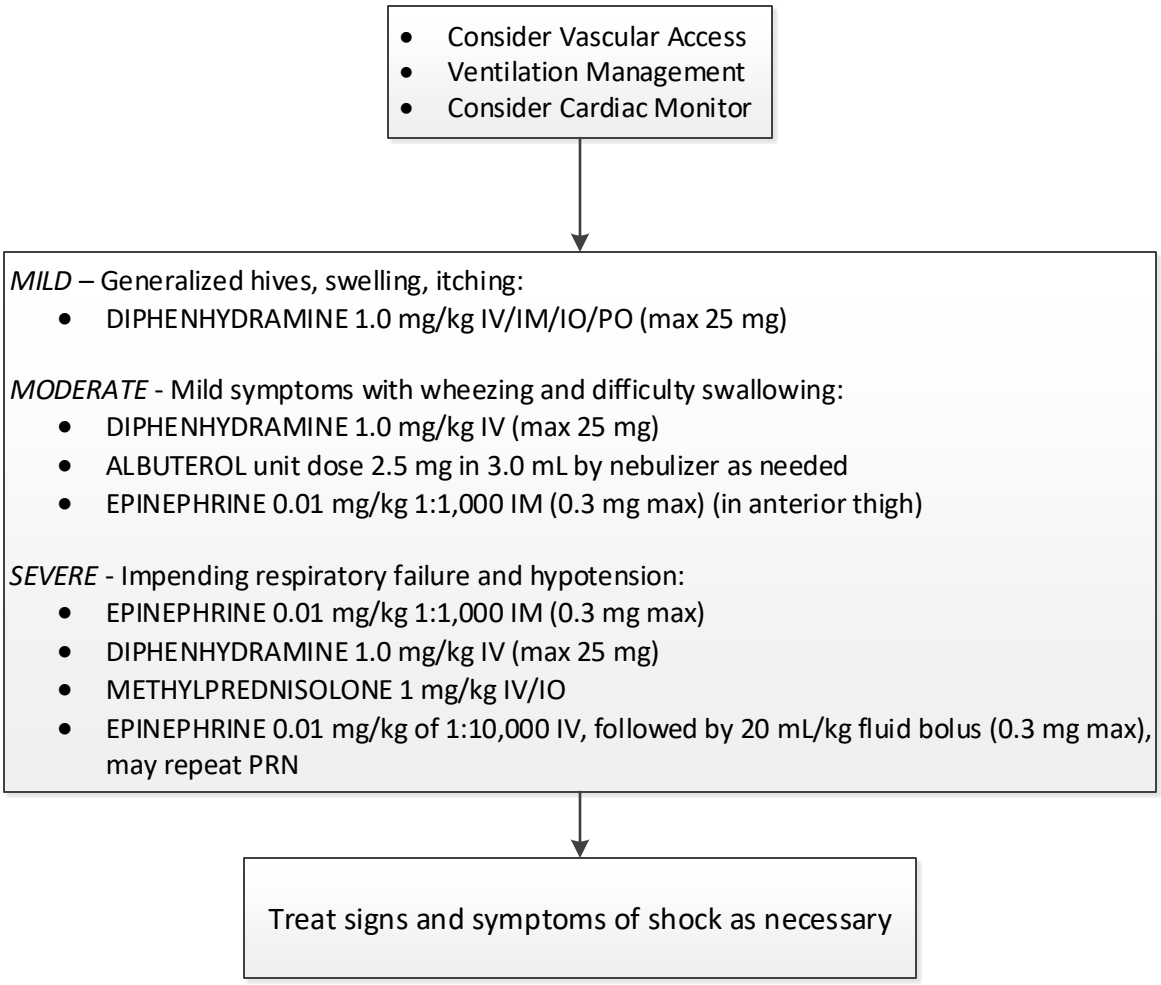
Pearls:

- **Expedite transport if unable to immediately resolve obstruction.**
- Surgical cricothyrotomy is contraindicated in the pediatric patient.
- If the patient presents with trismus and noisy respirations, insert a NPA and attempt to assist ventilations with a BVM.
- Avoid hyperventilation.
- Maintain $EtCO_2$ at 35-45.

Pediatric Allergy/Anaphylaxis

Washoe County Regional Protocols

Anaphylaxis is defined as an acute onset of an illness (over minutes to several hours) involving the skin, mucosal tissue, or both (e.g., generalized hives, pruritus or flushing, swollen lips-tongue-uvula) and respiratory compromise (e.g., dyspnea, wheeze-bronchospasm, stridor, reduced peak expiratory flow, hypoxemia) and/or reduced blood pressure (BP) or associated symptoms of end-organ dysfunction (e.g., hypotonia [collapse] syncope, incontinence).



Pediatric Behavioral Emergency

Patient restraint – when patient is a threat to themselves, bystanders or EMS personnel

- Patients may be restrained with soft restraints
- Restraining opposing muscle groups (swimmers position) is most effective; never restrain in prone/hog-tied position
- Assess distal CMS after restraint, every 10 minutes
- Obtain vascular access as needed
- Apply cardiac monitor and monitor ETCO2 - **required with chemical restraint.**
- Document reasons for restraint
- Incarcerated person may be restrained at the discretion of Law Enforcement
  - For handcuffed patients, request Law Enforcement accompaniment

MIDAZOLAM 0.2 mg/kg IV/IO/IN/IM; may repeat as needed.

KETAMINE 1 mg/kg IV/IO; may repeat once after 5 minutes; Max single dose 50mg.

-OR-

KETAMINE 3 mg/kg IM; Max single dose 150 mg.

Pearls:

- KETAMINE is contraindicated for patients with a history of schizophrenia.
- Use caution when using KETAMINE for suspected alcohol intoxication.
- Strongly consider alternative agents to KETAMINE for patients with a suspected head injury.
- If using KETAMINE, consider MIDAZOLAM to prevent reemergence phenomenon.
- Hostile, angry or unwilling patients who are competent may refuse service.
- Maximum IM of 3ccs for any fluid in a single muscle group.
- Ensure the patient is searched for weapons prior to transport.

Pediatric Burns

Some patients may bypass the nearest trauma center and be directly transferred to a burn center based on the destination protocol.

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
- 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

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Consider *Pediatric Pain Management/Sedation* protocol

Electrical Burn/Lightning

- Protect rescuers from live electric wires
- Separate victim from electrical source when safe for rescuers
- Initiate CPR as needed
  - For victims in cardiac arrest, treatment should be early, aggressive, and persistent
  - Victims with respiratory arrest may require only ventilation and oxygenation to avoid secondary hypoxic cardiac arrest
  - Resuscitation attempts may have high success rates and efforts may be effective even when the interval before the resuscitation attempt is prolonged
- Place patient on cardiac monitor
- Obtain vascular access
- Treat any thermal burns as outlined above
- Assess for other injuries
- Consider contacting pediatric center for guidance

↓

- Consider *Pediatric Pain Management/Sedation* protocol
- Treat dysrhythmias per protocol

Pediatric Burns

Some patients may bypass the nearest trauma center and be directly transferred to a burn center based on the destination protocol.

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
- Determine burn body surface area (BSA)
  - 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:
  - ≤ 5 years old – 125 mL per hour
  - 6-12 years old – 250 mL per hour
  - LR is preferred

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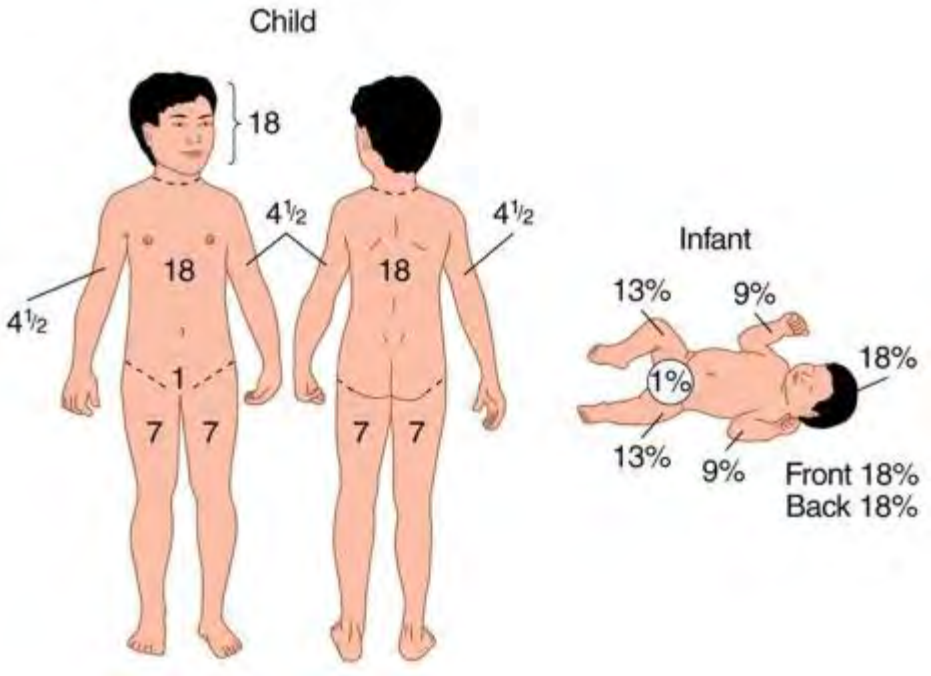
Consider *Pediatric Pain Management/Sedation* protocol



Pearls:

- Consensus Burn Formula:
  Flame, Scald, Chemical - 3ml/kg x %TBSA
  Electrical – 4ml/kg x %TBSA
  - Administer 50% of total fluids in first 8 hours from time of injury
  - Administer 50% of total fluids over next 16 hours
- BSA is calculated for partial thickness and full thickness burns.

Pediatric Cardiac - Arrest

- Unconscious and unresponsive
- Pulseless
- Does not meet *Resuscitation/Prehospital Death Determination* protocol

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- Begin CPR - pulse check/rhythm interpretation every 2 minutes
  - Continue CPR following all pulse checks as indicated by Pt condition
- Place patient on cardiac monitor or AED
- Manage airway as indicated by patient condition
- Consider reversible causes

VF, pVT, TdP

↓

- Defibrillate at 2 J/kg
- Obtain vascular access

EPINEPHRINE 0.01 mg/kg 1:10,000 IV/IO or 0.1 mg/kg 1:1,000 ETT every 3- 5 minutes

- Consider BIAD or ETT

↓

Shockable rhythm

Yes

↓

- Defibrillate at 4 J/kg
- Subsequent defibrillations increase in 2 J/kg increments to a max of 10 J/kg not to exceed the adult dose
- AMIODARONE 5 mg/kg IV/IO; may repeat x 2 if refractory VF/VT (max 15 mg/kg)

OR

- LIDOCAINE 1.0 mg/kg IV/IO (max 3 mg/kg)
- If no IV/IO access LIDOCAINE 2.5 mg/kg ETT, may repeat x 1. If IV/IO access is established after ETT dose, may repeat at 1 mg/kg IV/IO
- If the patient converts to a perfusing rhythm after administration of LIDOCAINE start LIDOCAINE infusion at 20-50 mcg/kg/min

<u>If TdP</u>

MAGNESIUM SULFATE 25-50 mg/kg
Max of 2 g

- Check pulse if organized rhythm
- Use Asystole/PEA as indicated
- Consider consultation of **Medical Control** for termination of efforts
  - Minimum of 3 rounds of medication are required prior to contact

Asystole/PEA

↓

Obtain vascular access

↓

- EPINEPHRINE 0.01 mg/kg 1:10,000 IV/IO or 0.1 mg/kg 1:1,000 ETT every 3- 5 minutes
- Consider BIAD or ETT

↓

Shockable rhythm

Yes

↓

Use VF, pVT, TdP as indicated

Pearls:

- Hypoxia is the leading cause of cardiac arrest in pediatric patients.
- Use caution when administering two or more ventricular antidysrhythmics, as it may have a proarrythmic effect.
- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.
- DO NOT HYPERVENTILATE.
- Reassess and document ETT placement using auscultation and $EtCO_2$ capnography.
- Adult paddles/pads may be used on children weighing greater than 15 kg.

Pediatric Cardiac - Bradycardia

- Ventilation Management (Primary cause of Bradycardia in pediatrics is hypoxia)
- Cardiac Monitor
- Establish vascular access

↓

HR < 60 bpm causing hypotension, altered mental status, poor perfusion, or shock

↓

- CPR
- EPINEPHRINE 0.01 mg/kg IV/IO 1:10,000 q 3-5 min; MAX single dose 1 mg
- ETT 0.1 mg/kg 1:1,000

↓

If Refractory:

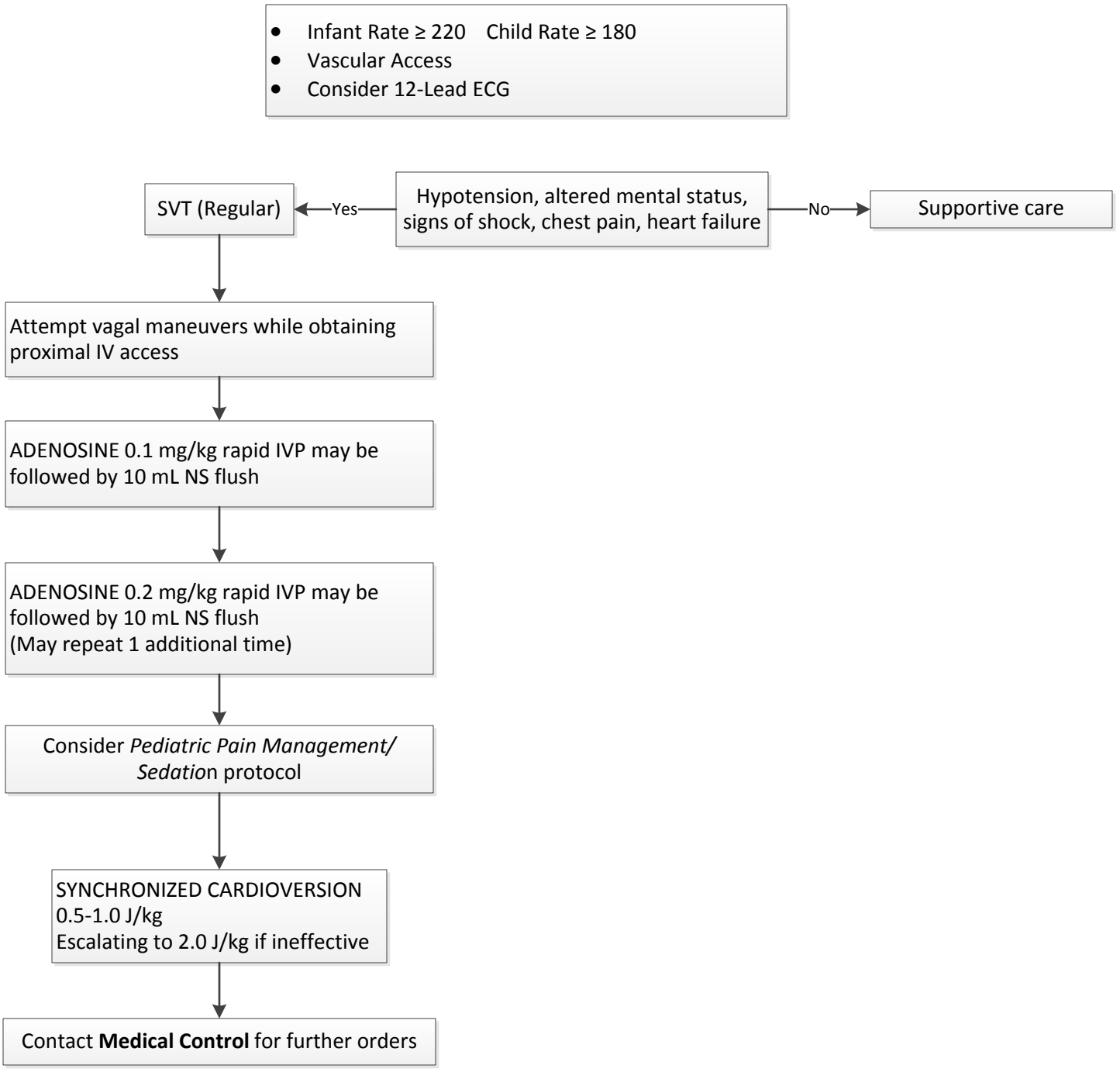
- ATROPINE for primary AV Block or increased vagal tone 0.02 mg/kg IV/IO q 5 min
  - Min single dose 0.1 mg – max single dose 0.5 mg
  - ETT: 0.04 mg/kg
- Consider transcutaneous pacing with sedation

Pearls:

- Emergency TCP is indicated in bradycardia due to complete heart block or sinus node dysfunction unresponsive to ventilation, oxygenation, chest compressions, and medications, especially if it is associated with congenital or acquired heart disease.

Pediatric Cardiac - Narrow Complex Tachycardia with Pulses

Washoe County Regional Protocols

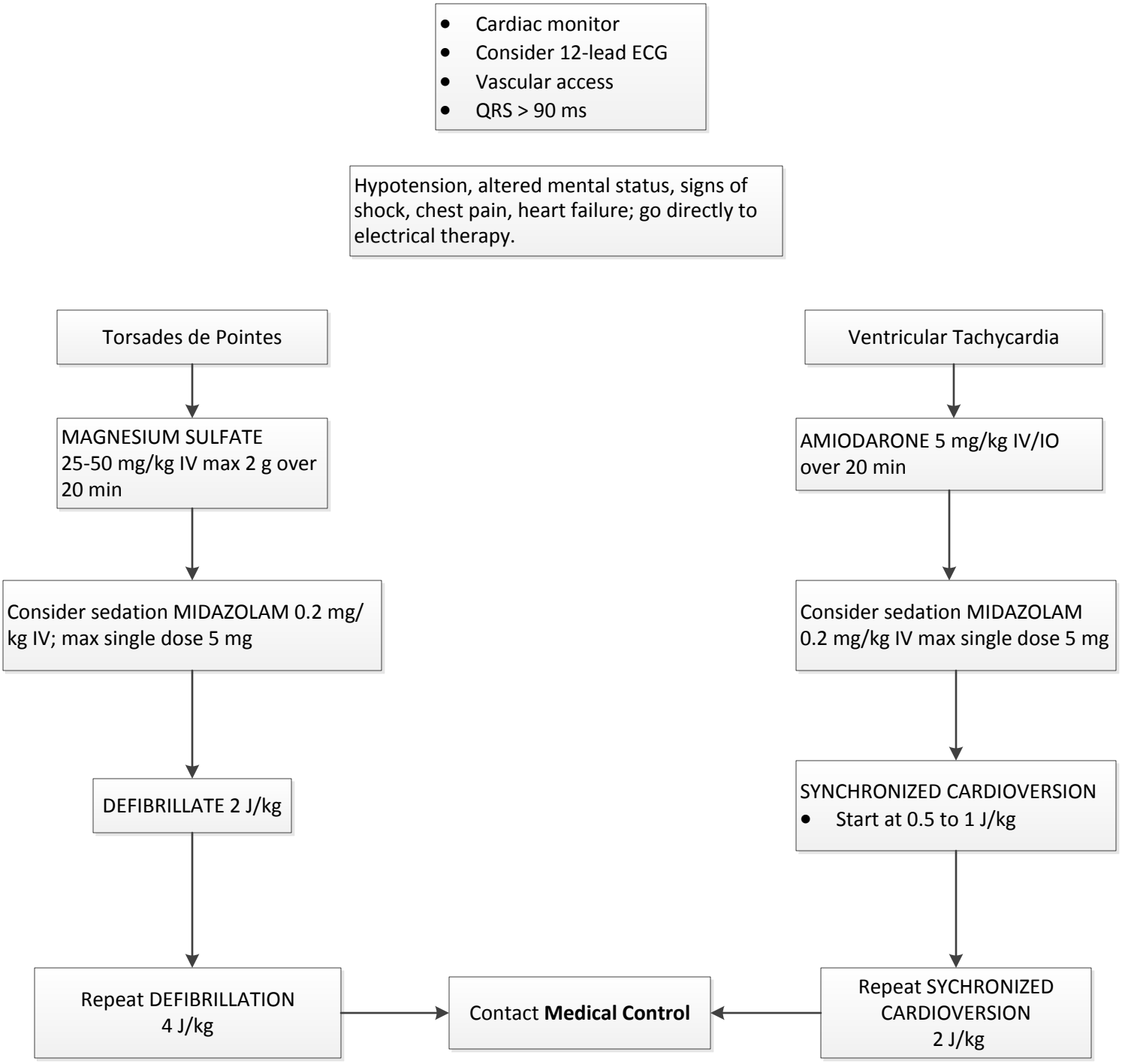


Pearls:

- QRS width > 90 ms is considered wide and possibly SVT with aberrancy and rarely VT.
- May go directly to Cardioversion at any time if severely symptomatic or patient deteriorating.
- Consider alternate causes such as fever, dehydration, caffeine/energy drink consumption, electrolyte imbalance, drug use.

Pediatric Cardiac - Wide Complex Tachycardia with Pulses

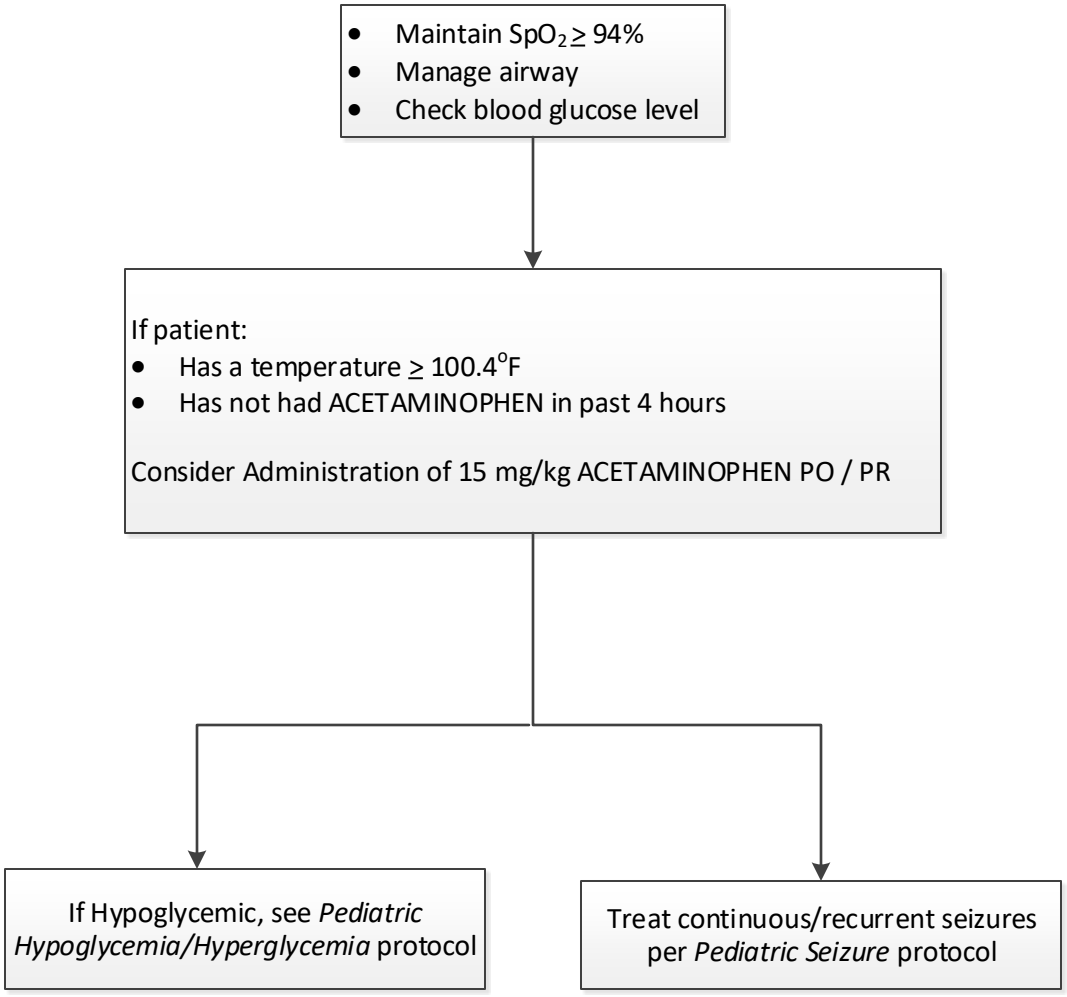
Washoe County Regional Protocols



Pearls:

- Consider most wide complex tachycardias in children as an aberrantly conducted SVT. Obtain 12 lead ECG if practical, but do not delay treatment.
- May go directly to defibrillation in Torsade de Pointes if severely symptomatic.

Pediatric Fever



Pearls:

- Do not utilize cooling measures in a pediatric patient < 28 days of age.
- Excessive fluid boluses provided to febrile children may lead to complications – administration of IV fluid boluses should be undertaken with extreme caution.
- Consider a pediatric patient to have meningitis or sepsis until proven otherwise.
- Cocaine, amphetamines and salicylates may elevate body temperatures.
- Sweating generally disappears as body temperatures rise over 104°F.
- Intense shivering may occur as patient is cooled.
- Remove clothing and begin passive cooling. Do not use cold packs or ice to cool the patient.
- Dropping the temperature of a patient too quickly may cause seizures.

Pediatric Hyperglycemia/Hypoglycemia

- Establish baseline level of consciousness
- Manage the airway and breathing as indicated by the patient's condition
- Consider possible reversible causes prior to placement of an advanced airway
- Consider Cardiac Monitor

- BGL < 60 mg/dl (< 40 mg/dl in Neonates)
- ORAL GLUCOSE if the patient is alert/ able to protect their own airway
  - ≤ 28 days D10, 2 mL/kg IV/IO/UV
  - > 28 days D10 or D25, 2 mL/kg IV/IO
- Max single dose 25 gm
- If no IV Access, GLUCAGON:
  - 0.5 mg IM (< 20 kg)
  - 1.0 mg IM (> 20 kg)
- Reassess BGL after each intervention as necessary; titrate to effect

If BGL > 250 mg/dl NS bolus 10-20 mL/kg over 1 hour

Pearls:

- Neonate considerations for infants ≤ 28 days old (4 weeks).
- Heel stick for patients < 6 months old.
- Fluid management in DKA is complex and may contribute to risk of cerebral edema.

Pediatric Hyperthermia/Heat Emergency

Heat Exhaustion

- Body temperature up to 104°F/40°C
- Minor CNS changes, weakness, dizziness, fainting
- Nausea, headache, dilated pupils, no appetite
- Skin clammy, pale and moist
- Muscle cramps/pain
- NS bolus 20 mL/kg IV/IO; maintain age appropriate SBP ≥ 70 + (2 x age); max 60 mL/kg

Heat Stroke

- Body temperature 104°F/40°C or greater
- Altered mental status or loss of consciousness
- Convulsions, seizures
- Tachycardia, hypotension
- Skin (hot, red, dry)
- Severe vomiting or diarrhea
- NS bolus 20 mL/kg IV/IO; maintain age appropriate SBP ≥ 70 + (2 x age); max 60 mL/kg

- Consider Cardiac Monitor and attempt to obtain body temperature
- Remove patient from hot environment and remove clothing
- Begin active cooling of patient

Treat seizures per the *Pediatric Seizure* protocol

Pearls:

- **Heat exhaustion can rapidly progress to heat stroke if untreated.**
- Heat stroke requires very aggressive cooling.
- Active cooling includes application of cold packs (not directly on skin), fanning, air conditioner or air movement.
- Intense shivering may occur as patient is cooled, discontinue aggressive cooling methods.
- Sweating generally disappears as body temperatures rise over 104°F/40°C.
- Wet sheets without good airflow may increase body temperature.
- Neonate ≤ 28 days fluid bolus 10 mL/kg IV/IO.

Pediatric Hypothermia/Cold Emergency

- Remove wet clothing and protect from environment
- Monitor temperature

Localized cold injury

- General wound care
- DO NOT rub skin to warm
- DO NOT allow refreezing

Systemic hypothermia

- Active warming measures
- Vascular access
- Cardiac Monitor
- Consider warm NS bolus 20 mL/kg IV/IO; maintain age appropriate SBP $\geq$ 70 + (2 x age), max 60 mL/kg

Transport all severely hypothermic patients regardless of response to treatments. Follow appropriate protocols for other treatment/transport decisions.

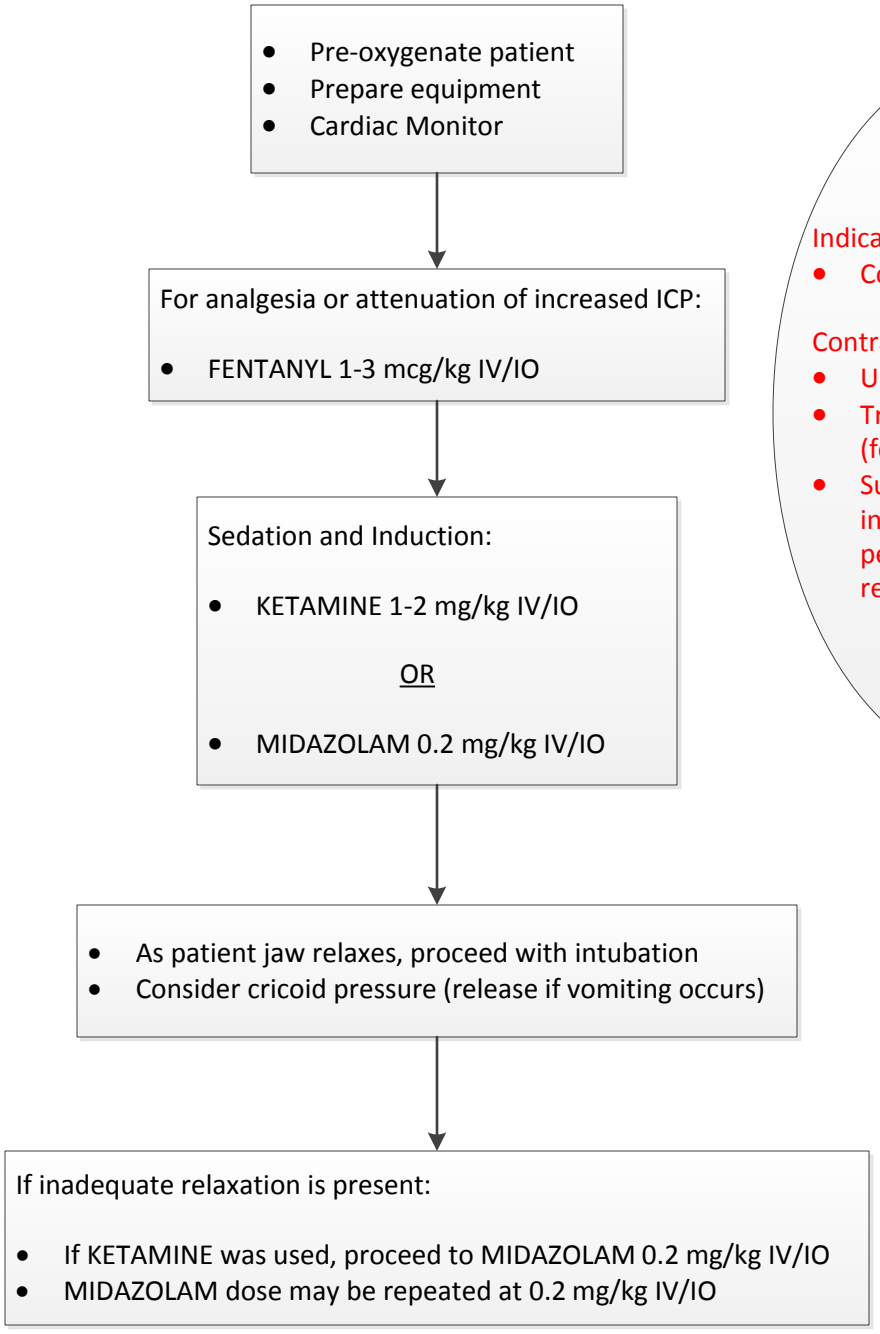
Patient with pulse	
Core Temperature	Treatment
93.2^{O}F – 96.8^{O}F	Passive re-warming and active external re-warming
86^{O}F – 93.2^{O}F	Passive re-warming and active external re-warming to trunk areas only

Patient without a pulse	
Start CPR, defibrillate once if indicated	
Core Temperature	Treatment
< 86^{O}F	CPR, withhold IV medications, limit to one shock for VF/VT/Torsades
> 86^{O}F	CPR, give IV medications at longer intervals, repeat defibrillation for VF/VT/Torsades, passive re-warming and active external re-warming to trunk areas only

Pearls:

- Extremes of age are more prone to cold emergencies.
- If temperature is unknown, treat the patient based on suspected temperature.
- For the severely hypothermic patient, perform procedures gently and monitor cardiac rhythm closely.
- Active warming includes hot packs that can be used on the armpit and groin; care should be taken not to place the packs directly on the skin.
- If available, core temperature is preferred.

Pediatric Medication Assisted Intubation

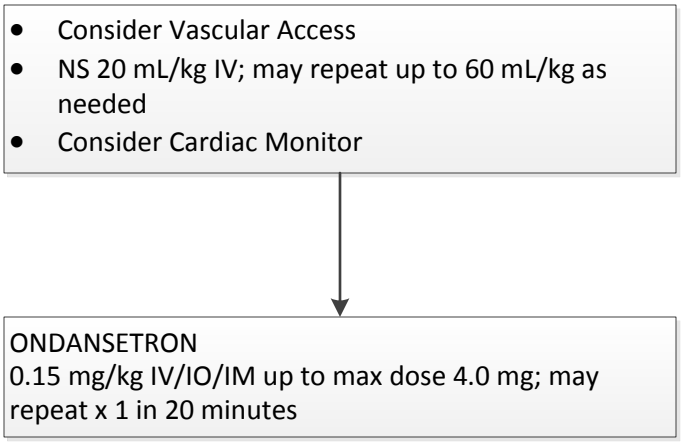


Indications:
- Contact Medical Control

Contraindications:
- Upper *Airway Obstruction*
- Tracheal obstruction (foreign body, tumor)
- Suspected pharyngeal infection (epiglottitis, peritonsilar or retropharyngeal abscess)

Pearls:
- Pharmacological agents are used to assist the provider in performing intubation in patients with high intubation difficulty due to excessive gag reflux. In these instances, protecting the airway is a potentially life-saving maneuver. These patients may include: Isolated *Head Trauma*, *Multisystem Trauma*, *Overdose*, Status Epilepticus, *Respiratory Failure*, *Severe Burns*, or based on anticipated clinical course.
- Most pediatric airways can be effectively managed with BLS interventions.

Pediatric Nausea/Vomiting



Pediatric Neonatal Resuscitation

- Provide warmth
- Assure open airway
- Clear secretions if needed
- Dry baby
- Stimulate
- If fetal demise is recognized after cord is clamped and cut, and known gestational age is ≤ 22 weeks, treat as a miscarriage and provide supportive care to family.

HR < 100, gasping, or apnea?

No → Labored breathing or persistent cyanosis?

Yes → Position and clear airway; Monitor SpO_2; O_2 as needed

Yes →
- PPV 40-60/min
- Monitor SpO_2
- Cardiac Monitor

HR < 100?

No → Post-Resuscitation care

Yes →

Ventilation Management - Corrective steps may include intubation

HR < 60?

- CPR 3:1 ratio
- Intubate
- PPV
- 100% O_2
- Vascular Access

HR < 60?

EPINEPHRINE 0.01 mg/kg (0.1 mL/kg) 1:10,000 IV/IO q 3-5 min as needed for HR < 60 (ETT dosing 1 mL/kg)

Consider NS 10 mL/kg x 1

→ Consider contacting **Medical Control**

Pediatric Neonatal Resuscitation

Washoe County Regional Protocols

APGAR	Score=0	Score=1	Score=2
• **Activity/Muscle Tone**	Absent	Arms/legs flexed	Active Movement
• **Pulse**	Absent	Below 100	Above 100
• **Grimace/Reflex Irritability**	No response	Grimace	Sneeze, cough, pulls away
• **Appearance/Skin Color**	Blue-Grey, pale all over	Normal, except extremities	Normal over entire body
• **Respiration**	Absent	Slow, irregular	Good, crying

Targeted pre-ductal SpO_2 after birth

1 minute	60% - 65%
2 minute	65% - 70%
3 minute	70% - 75%
4 minute	75% - 80%
5 minute	80% - 85%
10 minute	85% - 95%

Pearls:

- Neonate considerations for infants ≤ 28 days (4 weeks).
- Deep suctioning is no longer recommended.
- Most newborns requiring resuscitation will respond to BVM, compressions and Epi. For those that do not, consider hypovolemia, pneumothorax, and/or hypoglycemia (BG < 40).
- Document all times (delivery, contraction, duration, frequency).
- Record APGAR at one and five minutes after birth.
- Ideal placement of pulse oximetry is on the right hand for pre-ductal SpO_2. See attached chart for target ranges.
- Pre-term newborns are susceptible to oxygen toxicity.
- Transport mother and infant together whenever possible.
- Maintaining temperature of newborn is essential.

Pediatric Overdose/Poisoning

Washoe County Regional Protocols

Poison Control - (800) 222-1222 OR (775) 982-4129

- Determine cause of poisoning/overdose, treat as appropriate
- Cardiac Monitor

Carbon monoxide (CO)

- Place patient on CO monitor, do not rely on pulse oximeter readings
- If patient's SpCO is:
  - 0 – 5 % - Considered normal for non-smokers. When > 3% with symptoms, consider high flow oxygen and recommend transport. If asymptomatic, no further medical evaluation necessary of SpCO. Counsel patients on signs and symptoms to watch, offer transport to ED, if refused complete AMA.
  - 5 – 10 % - Considered normal for smokers, abnormal for non-smokers. If symptoms are present, consider high flow oxygen and recommend transport to ED.
  - 10 – 15 % - Abnormal in any patient. Assess for symptoms, consider high flow oxygen and recommend transport to ED.
  - > 15 % - Significantly abnormal in any patient. Administer high flow oxygen and recommend transport to ED.
  - > 30 % - Consider transport/referral to hyperbaric facility (consider referral to hyperbaric facility if > 25% for patients with ALOC or pregnant).
- If patient has altered LOC, neurological impairment, or > 25% SpCO, treat with 100% O_2 and transport to nearest appropriate facility
- Continue supportive therapies as needed

Opiates

NALOXONE 0.1 mg/kg IV/IO/IM/IN, max single dose 0.5 mg; may repeat to a max dose of 10 mg

Tricyclic Anti-Depressants

- For patients with any of the following:
  - Dysrhythymias, or QRS of ≥ 120 ms
  - Hypotension
  - Seizure
  - Cardiac Arrest
- Administer SODIUM BICARBONATE 1.0 mEq/kg IV
- If patient is intubated, ventilate patient to maintain $EtCO_2$ level of 28-30 mmHg

Organophosphate Poisoning (Insecticide)

ATROPINE 0.02 mg/kg IV/IO q 3-5 minutes as needed to decrease secretions and ventilator resistance; min single dose 0.1 mg

Agents:

- Acetaminophen: Initially normal or N/V. Tachypnea and AMS may occur later. Renal dysfunction, liver failure and/or cerebral edema may manifest.
- Depressants: Decreased HR, BP, temp and RR.
- Anticholinergic: Increased HR, increased temperature, dilated pupils and AMS changes.
- Insecticides: May include S/S of organophosphate poisoning.
- Solvents: N/V, cough, AMS.
- Stimulants: Increased HR, BP, temperature, dilated pupils, seizures, and possible violence.
- TCA: Decreased mental status, dysrhythmias, seizures, hypotension, coma, death.
- **Beta Blocker Overdose**: call for possible administration of GLUCAGON.
- **Calcium channel blocker**: call for possible administration of CALCIUM CHLORIDE and/or GLUCAGON.

Pediatric Overdose/Poisoning

Poison Control - (800) 222-1222 OR (775) 982-4129

Cyanide Exposure

For known cyanide poisoning in the absence of exposure to smoke, refer to the cyanide antidote parameters contained within the *Pediatric Smoke Inhalation* protocol

Pearls:

- Powdered HYDROXOCOBALAMIN will be reconstituted with 200 cc 0.9% normal saline or lactated ringers. Then repeatedly invert for 60 seconds PRIOR TO administration. DO NOT SHAKE.
- If patient is suspected to have narcotic overdose/hypoglycemia, administer NALOXONE/GLUCOSE prior to BIAD device/ intubation.
- CALCIUM CHLORIDE is contraindicated in patients with suspected digitalis toxicity.
- Cyanide toxicity should be suspected for any patient being treated for Carbon Monoxide toxicity from smoke inhalation. Conscious patients with symptoms will require **Medical Control** prior to administration.
- Consider a second line if possible for administration and avoidance of possible medication incompatibilities.
- For suspected ingestion, consider NG tube placement.
- Overdose or toxin patients with significant ingestion/exposure should be closely monitored and aggressively treated. Do not hesitate to contact **Medical Control** if needed.
- In the case of cyanide poisoning, altered mental status may be profound. Profound altered mental status can be defined as a deficit that includes disorientation, bewilderment and difficulty following commands.

Pediatric Pain Management/Sedation

Washoe County Regional Protocols

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.

- Keep $SpO_2 \geq 94\%$
- Vascular Access
- Consider Cardiac Monitor

Comfort measures:
- Patient positioning
- Splinting
- Ice

Pain Management

- ACETAMINOPHEN 15 mg/kg PO
- IBUPROFEN 10 mg/kg PO
- NITROUS OXIDE as long as the patient is able to follow directions
- FENTANYL 1.0 mcg/kg IN/IM/Slow IV/IO may repeat q 5 as needed
- MORPHINE SULFATE 0.1 mg/kg IV/IO/IM max single dose 5 mg, may repeat q 10 as needed
- KETAMINE 0.3 mg/kg IV/IO/IM/IN max single dose 30 mg, may repeat q 15 min as needed

Sedation

MIDAZOLAM 0.2 mg/kg IV/IO/IN/IM may repeat as needed

KETAMINE 1mg/kg IV/IO; may repeat once after 5 minutes; Max single dose 50mg

-OR-

KETAMINE 3mg/kg IM; Max single dose 150mg.

Contact **Medical Control** for additional doses

Pearls:
- Ophthalmic anesthetics may be used for ocular injuries, 1-2 drops, as needed.
- Consider prophylactic ONDANSETRON use when administering pain medication.
- Pain severity (1-10) is a vital sign to be recorded before and after medication administration and patient hand off.
- Monitor BP and respirations closely as sedative and pain control agents may cause hypotension and/or respiratory depression.
- Consider patient's age, weight, clinical condition, use of drugs/alcohol, exposure to opiates, when determining initial opiate dosing. Weight based dosing may provide a standard means of dosing calculation, but does not predict response.
- Exercise caution when administering opiates and benzodiazepines; this combination results in deeper sedation with significant risk of respiratory compromise.
- If using KETAMINE, consider MIDAZOLAM to prevent reemergence phenomenon.
- Monitor ETCO2 for chemical sedation.
- Maximum IM of 3ccs for any fluid in a single muscle group.

Pediatric Respiratory Distress

- Cardiac monitor
- SpO_2 and $EtCO_2$ monitoring

Bronchospasm/Asthma/Reactive Airway Disease

ALBUTEROL 2.5 mg in 3.0 mL via HHN until symptoms improve

Duoneb 2nd & 3rd HHN ** additional HHNs use ALBUTEROL

If patient's condition deteriorates, consider:
EPINEPHRINE 0.01 mg/kg 1:1,000 IM anterior thigh q 15 mins; MAX 0.3 mg

Impending Respiratory Failure:
EPINEPHRINE 0.01 mg/kg of 1:10,000 q 3-5 mins IV/IO; MAX 1 mg

- ETT: 0.1 mg/kg 1:1,000 EPINEPHRINE q 3-5 mins

METHYLPREDNISOLONE 1 mg/kg IV/IO; MAX 125 mg

Status Asthmaticus
MAGNESIUM SULFATE 25-50 mg/kg mixed in 100 mL NS IV infusion over 20 mins; MAX 2 gm

Suspected Croup

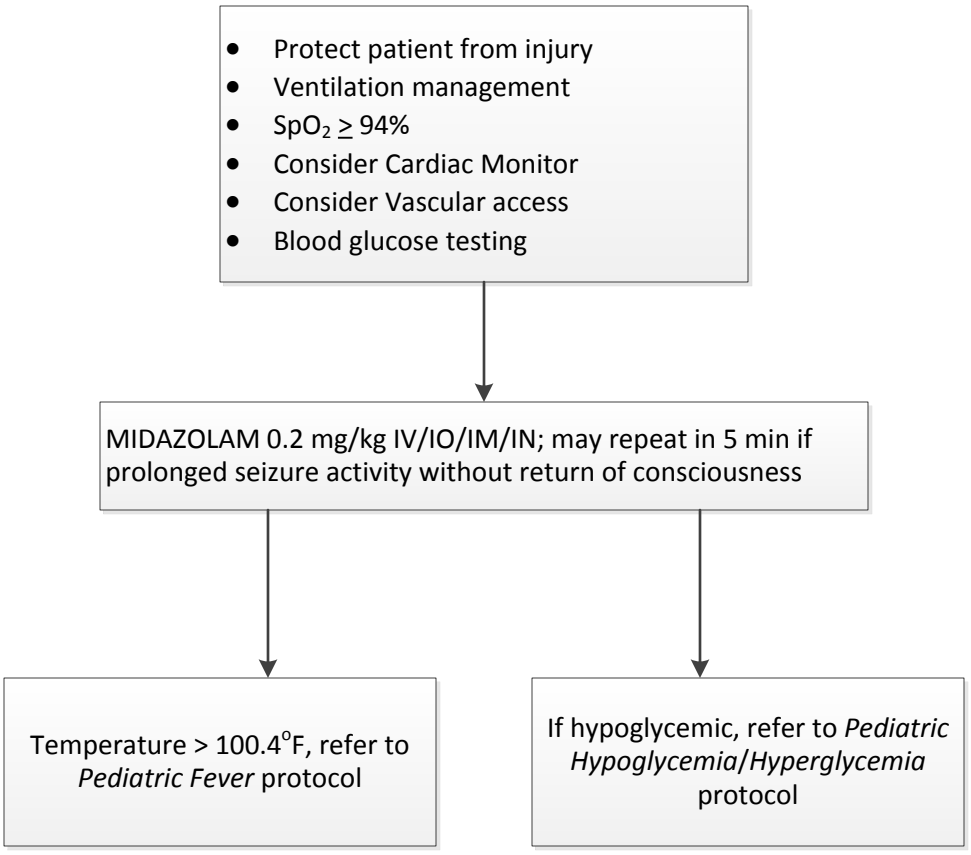
< 6 months 0.25 mL 2.25% RACEMIC EPINEPHRINE in 3 cc NS via HHN
OR
< 6 months 0.25 mg of EPINEPHRINE in 3 cc NS via HHN (may repeat x 1 in 20 minutes)

> 6 months 0.5 mL 2.25% RACEMIC EPINEPHRINE in 3 cc via HHN
OR
> 6 months 0.5 mg of EPINEPHRINE in 3 cc via HHN (may repeat x 1 in 20 minutes)

Pearls:

- Duoneb equivalent can be achieved by combining 0.5 mg IPRATROPRIUM in 2.5 mg ALBUTEROL.
- Be prepared to assist ventilations as needed.
- Pulse oximetry and end tidal continuous waveform capnography must be monitored.
- Allow the patient to assume a position of comfort.
- Respiratory distress secondary to drowning may require PEEP and/or nebulizer treatment.
- Croup may respond positively to cold environment and nebulized saline.

Pediatric Seizure



Pearls:

- Benzodiazepines are well tolerated in pediatrics; do not delay IM/IN administration while initiating an IV.
- Status epilepticus is defined as two or more seizures successively without an intervening lucid period, or a seizure lasting over five minutes.
- Grand mal seizures (generalized) are associated with loss of consciousness, incontinence and or trauma.
- Focal seizures affect only part of the body and are not usually associated with a loss of consciousness.
- Be prepared to address airway issues and support ventilations as needed.

Pediatric Smoke Inhalation

Individuals may present with soot around nose and mouth after exposure to smoke from a structure fire or other sources (vehicle fire, industrial gases, confined spaces, etc.)

- Keep $SpO_2 \geq 94\%$
- Ventilation management
- Cardiac Monitor

↓

- Vascular Access
- NS bolus 20 mL/kg up to 60 mL/kg for hypoperfusion

↓

Other treatment protocols as indicated

If the patient presents with cardiac arrest, hypotension, altered mental status or other signs and symptoms consistent with Cyanide (CN) poisoning, administer:

HYDROXOCOBALAMIN 70 mg/kg IV over 15 minutes

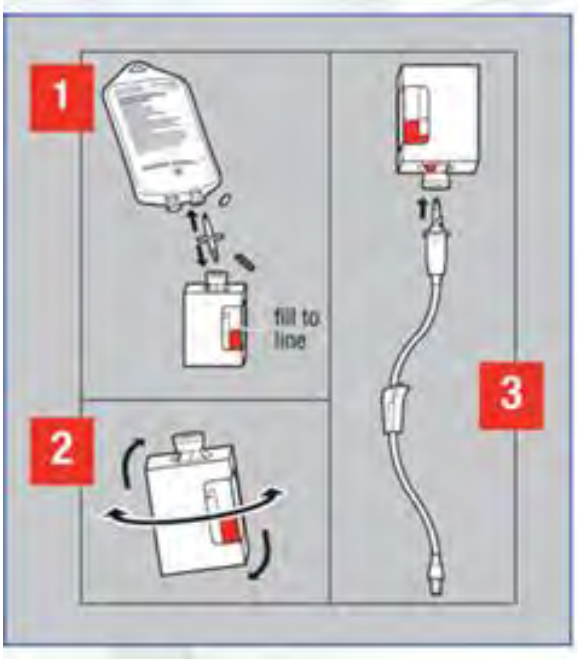
Complete Starting Dose: 5 g

1. **Reconstitute:** Place the vial in an upright position. Add 200 mL of 0.9% Sodium Chloride injection* to the vial using the transfer spike. **Fill to the line.**

   *0.9% Sodium Chloride injection is the recommended diluent (diluent not included in the kit). Lactated Ringers injection and 5% Dextrose injection have also been found to be compatible with hydroxocobalamin and may be used if 0.9% Sodium Chloride is not readily available

2. **Mix:** The vial should be repeatedly inverted or rocked, not shaken, for at least **60 seconds** prior to infusion.
   - CYANOKIT solutions should be visually inspected for particulate matter and color prior to administration
     - Discard solution if particulate matter is present or solution is not dark red

3. **Infuse Vial:** Use vented intravenous tubing, hang and infuse over **15 minutes.**



Pearls:

- Signs and symptoms consistent with Cyanide (CN) poisoning include:
  - Weakness, dizziness, headache, stupor, dilated pupils, dyspnea
  - Tachypnea, tachycardia, nausea, vomiting, tightness in the chest
  - Altered LOC, cardiovascular collapse, combativeness, confusion
  - Plasma Lactate concentration ≥ 8 mmol/L
  - Late signs: Cardiac arrest, apnea, bradypnea, hypotension, seizures
- Low $EtCO_2$ can be indicative of an elevated serum lactate level (less than 25).
- If the medication is not available on scene do not delay transport waiting for it.
- Decide early on if you want to intubate as burned airways swell, making intubation difficult.

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OPERATIONAL PROTOCOLS

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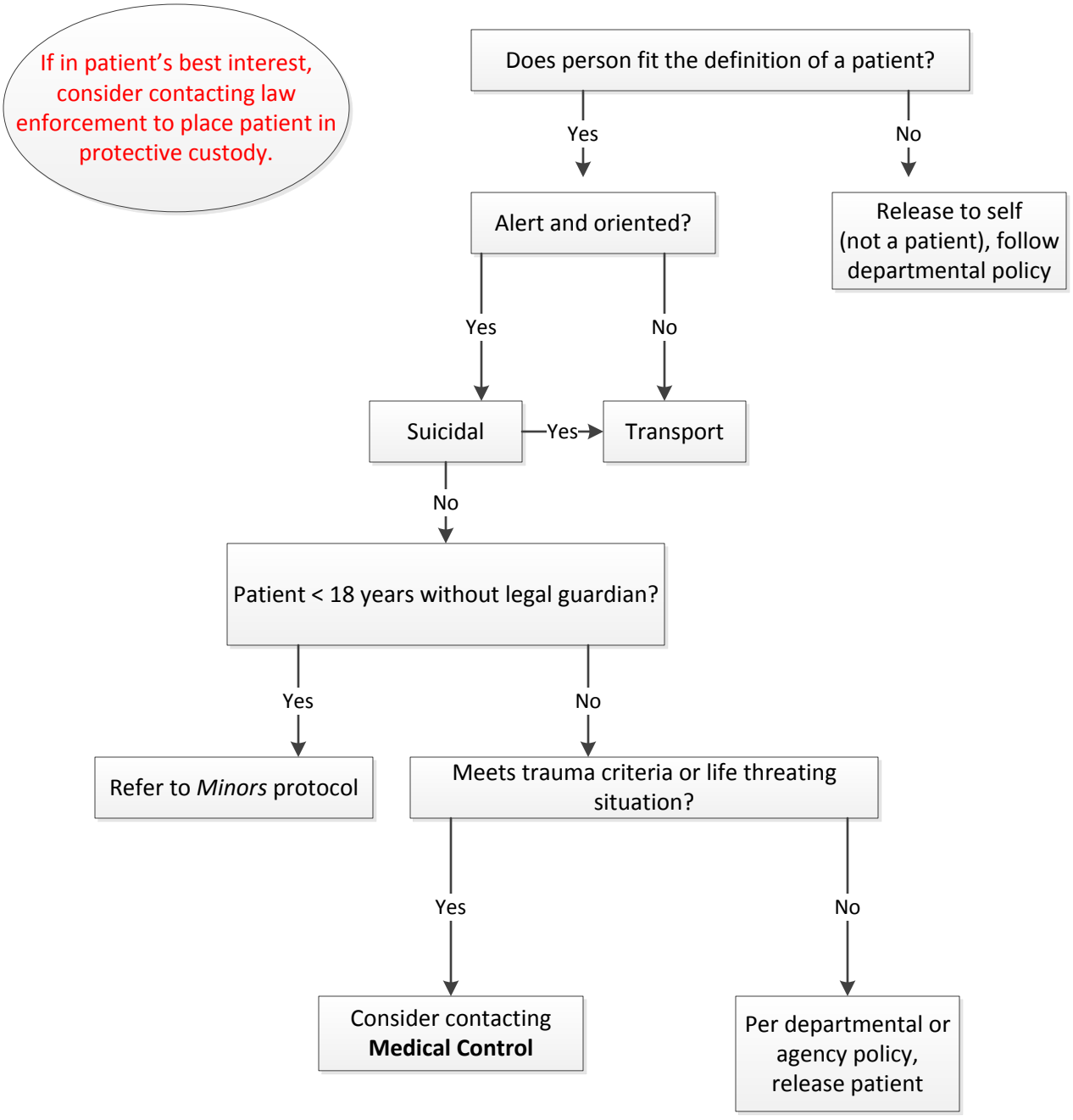
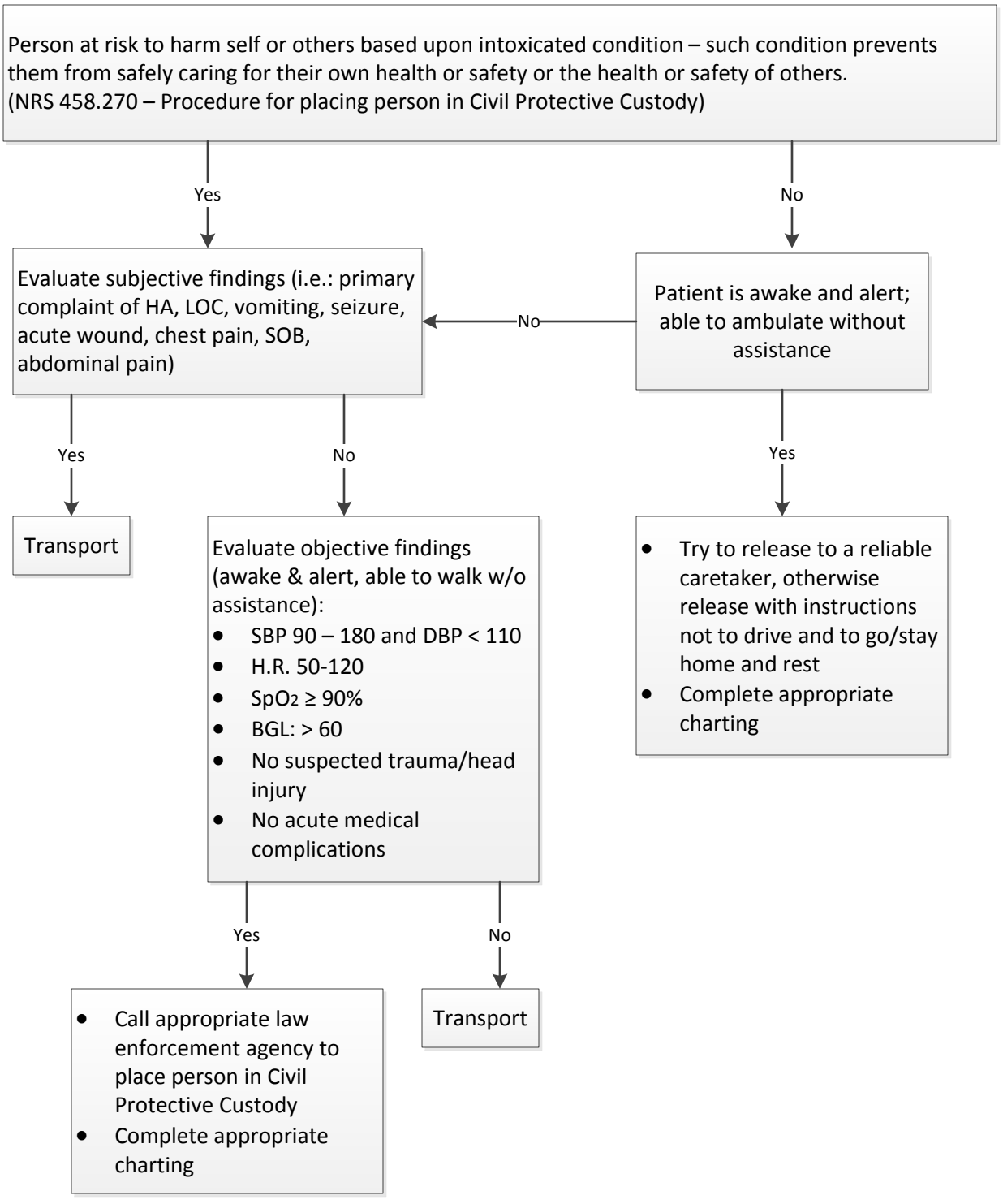
AMA Decision Tree

This applies only to the patient who has capacity and is competent: Patient is stable and able to understand and reiterate to you the problem, risks, and consequences of refusal of care.



Civil Protective Custody



Combative Patient

Patients who exhibit an agitated state and/or may be a harm to themselves or others, or interfere with their own care may be physically or chemically restrained to prevent injury/harm to the patient or crew. Physical or chemical restraint must be performed in a safe and humane manner and used only as a last resort. Attempts at verbal de-escalation should be used prior to restraints.

PROCEDURE

- Consider law enforcement assistance, as necessary.
- When appropriate, attempt less restrictive management of the patient, including verbal de-escalation.
- Patients requiring physical restraint should be place in the "swimmers" position using soft restraints.
- No devices such as backboards or other devices may be placed on top of the patient and no restraint should ever be placed across a patient's chest.
- It a patient is restrained by law enforcement personnel with handcuffs or other devices EMS cannot remove, a law enforcement officer should accompany the patient to the hospital in the transporting ambulance.
- The patient must be under constant observation by the EMS crew at all times. This includes continuous pulse oximetry. Cardiac monitor should be applied if medications are administered.
- Patients who are placed in physical restraints should have circulation checks performed every 10 minutes and documented.
- Documentation should include the reason for restraint and the type of restraint.
- The use of chemical sedation is at the discretion of the attending paramedic, when clinically indicated.

Pearls:

- Causes of combativeness may be due to comorbid medical conditions or hypoxia, hypoglycemia, drug and/or alcohol intoxication, drug overdose, or brain trauma.
- Excited/Agitated Delirium is characterized by extreme restlessness, irritability, and/or high fever. Patients exhibiting these signs are at a high risk of sudden death.
- Medications should be administered cautiously in patients under the influence of drugs and/or alcohol, as they may cause respiratory depression.
- Rapid intravenous administration of KETAMINE or BENZODIAZEPINES increases the risk of respiratory depression/apnea.
- Strongly consider alternative agents to KETAMINE for patients with a suspected head injury.
- Administer HALOPERIDOL with caution to patients who are already taking psychotropic medications, which may precipitate serotonin syndrome or malignant hyperthermia.
- When administering medications for sedation, basic and advanced airway equipment should be at the patient's side and readily available.

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Contact Medical Control When:

- EMS judgment suggests consultation with Medical Control Physician necessary
- EMS provider needs assistance in termination of resuscitation or requesting deviation from protocols
- Protocol requires base physicians contact for medication administration or other procedures
- Patient condition not addressed in protocols

Communication Failure:

- Protocol becomes standing order if:
  - Medical Control cannot be contacted (radio/phone failure)
  - Medical Control physician does not answer after reasonable time
- In the event Medical Control cannot be contacted, care will be delivered in the best interest of the patient.
- Medical crew will follow agency specific guidelines for reporting and review

Document:

- Report in accordance with agency policy
- Treatment requests/approved physician orders
- Time of contact and Medical Control physician's name

Destination

The final destination hospital has profound clinical, personal and financial implications for our patients. Hospitals in the Reno/ Sparks area offer different specialty services and patients may be better served at specific facilities.

Stable patients should be transported to the hospital of their choice. If the patient does not have a preference, the patient should be transported to the closest appropriate facility.

Base Hospitals

- **Northern Nevada Medical Center (NNMC)**
- **Renown Regional Medical Center (RRMC)**
- **Renown South Meadows Medical Center (RSMMC)**
- **Saint Mary's Regional Medical Center (SMRMC)**
- **Sierra Medical Center (SMC)**
- **Reno Veteran's Administration (VA) hospital** is considered a Base Hospital ONLY for those patients needing transport to that facility.
- **Incline Village Community Hospital (IVCH)** is not a base hospital, but is an acceptable destination for patients who request it.
- **Northern Nevada Free Standing Emergency Departments (FEDs)** are not base hospitals, but are an acceptable destination for patients who request it and who meet the criteria below.
- Other out-of-area hospitals are acceptable destinations with certain restrictions (i.e. closest hospital to the scene, other appropriate facilities are not bypassed or the patient does not meet trauma criteria).

Freestanding Emergency Department (FED) Destination Criteria

- Patients who require a medical or psychiatric evaluation and do not have evidence of any potentially life-threatening illness or injury at the time of transport may be transported to a freestanding emergency department if;
- The patient has vital signs within the range below, unless accepted by the freestanding emergency department and the patient does not meet any of the following exclusions criteria:
  - Violent or uncooperative
  - Patients > 20 weeks gestation
  - Any patient in need of time-critical intervention that can be provided only at a hospital-based emergency department. For example, but not limited to, STEMI, Stroke, or ACS.
  - Any condition covered by another destination directive:

Trauma Field Triage Criteria	Stroke Protocol	Burns Protocol
Pediatric Destination Protocol	Cardiac Arrest	

- Alternate transportation and destination decisions should be consistent with medical necessity and with consideration for patient preference when the patient's condition allows.

Adult normal vital signs:

Heart Rate 50-120	Respiratory Rate 10-20	Room air pulse oximetry $\geq$ 90%
Systolic BP 90-180	Diastolic BP < 110	Baseline Mental Status

TRANSPORT REQUIREMENTS

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

1. 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 the person determines that the patient is competent, the patient must be advised of the risks of not receiving further treatment at the center.

2. If the patient continues to refuse to be transported to the center for the treatment of trauma, the person providing emergency medical care shall request the patient to sign a statement indicating that the patient has been advised of the risks of not receiving further treatment at the center and continues to refuse to be transported to the center.

3. The person providing emergency medical care shall inform a physician at the location to which the person intends to transport the patient of the patient's refusal to be transported before the person leaves the scene of the injury.

BURN CENTER

- Second and/or third degree burns > 20% body surface area (BSA).
- Second and/or third degree burns > 10% BSA in patients under 10 or over 50 years of age.
- Significant burns that involve the face, hands, feet, genitalia, perineum or major joints.
- Electrical burns, including lightning injury.
- Chemical burns.
- Circumferential burns.
- Inhalation injury.

If the patient meets the criteria AND the burns are not complicated by major trauma, initiate air ambulance response.

Patient Destination Table

	RRMC	SMRMC	NNMC	SMC	RSMMC	IVCH	FEDs	TFH	CTH	BMH
Acute Coronary Syndrome (Non-Stemi)	X	X	X	X	X			X	X	
STEMI	X	X	X	X					X	
Possible Stroke	X	X	X	X					X	
Pediatric Airway	X									
Obstetric Emergency	X			X				X	X	X
Neonate	X			X						
Trauma Criteria	X									
Sexual Assault	X	X	X	X	X	X	X	X	X	X

Destination

Patient/Family Choice – Patient/family choice should dictate hospital destination unless the patient is excluded due to clinical conditions defined below, or hospital choice is on divert status.

Trauma (Special Resources) – Patients who meet Trauma Criteria shall be transported to the closest Level 1 or 2 trauma center. In most cases, this is RRMC. If the patient (who is deemed competent) meets trauma criteria, but requests another hospital, the provider should appropriately explain the rationale for transport to the trauma center. If the patient still requests another destination, contact medical control at the closest trauma center and obtain physician approval for diversion. By air, patients less than 14 years of age who meet trauma criteria will be transported, when appropriate, to RRMC or U.C. Davis (whichever is closest).

Nearest facility – If a patient and/or family has no hospital preference, the transport shall be to the designated hospital in the catchment area. If outside the catchment zone, the closest hospital by time.

OB (Special Resources) – Within Washoe County, only SMC and RRMC have obstetrical services. Obstetrical patients greater than 20 weeks gestation with complaints related to their pregnancy should not be transported to NNMC, RSMMC, SMRMC, NNERM or NNERSS.

Neurological Disease/Possible Stroke (Special Resources) – Patients with stroke symptoms, with duration of symptoms less than eight hours will be transported to a Primary Stroke Center. With the exception of divert status for an internal hospital disaster; patients that meet stroke criteria cannot be diverted. Outside the Reno/Sparks area, the patient will be transported to the closest hospital. If the patient, family, or patient's physician request another hospital, the patient will be taken to the requested hospital.

Pediatrics (Special Resources) – Pediatric 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. (Respiratory arrest goes to closest emergency department).

Neonatal (Special Resources) – Any patient 28 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. In both cases, these facilities are RRMC or SMC.

Other – Other acceptable reasons for destination selection are physician/facility request during an inter-facility transfer, transporting with/for another agency, such as fixed wing transfers, etc.

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 for injuries is requested. The police will be notified by the hospital for subsequent transport to the SART center upon completion of the medical evaluation and treatment.

Exceptions (Nearest facility) – Patients in cardiac arrest or who are in impending arrest, have an airway obstruction, uncontrolled hemorrhage, imminent delivery, or any condition that may be jeopardized by a longer transport are to be taken to the closest emergency department.

Acute Coronary Syndrome (Special Resources) – Any patient who meets the following criteria is taken to a hospital with interventional cardiology capabilities (RRMC, SMRMC, NNMC, SMC):

- 12 lead ECG shows evidence of an active STEMI AND/OR
- History of angioplasty, stent placement, or coronary artery bypass graft AND symptoms suggesting acute coronary syndrome. With the exception of divert status for an internal hospital disaster; patients that meet STEMI criteria cannot be diverted.
- Patients with chest pain and non-STEMI symptoms of acute coronary syndrome may be transported to any facility.

MCI – All hospital destinations during a declared MCI are coordinated and assigned by Medical Dispatch Facility.

Destination

Hospital Diversion – Occasionally, facilities may declare divert status for select patients. Document the reason for the diversion and take the patient to the patient's second choice or the closest base hospital. Diversion decisions are typically made without medical control contact.

- **Closed Divert** – The hospital has no capacity/resources to accept any ambulance patient.
- **Critical Care** Divert – The hospital has no capacity/resources to accept ambulance patients who have a high probability of requiring ICU admission; 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/RNs are encouraged to contact the ED Base Station physician directly to clarify questions about any potential transport.
- **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 prevision of save effective care in the emergency department.
- **Specialty Service Divert** – The hospital is experiencing a temporary lapse in service or critical diagnostic equipment or a specific department is unavailable due to capacity or lack of medical personnel coverage.
- **Telemetry Divert** – Any patient who, based on their clinical presentation, is suspected to required continuous cardiac monitoring and has the potential to be admitted to a Telemetry unit, shall be diverted to the most appropriate alternative destination. Patients who are receiving cardiac monitoring solely due to procedural or protocol directive do not automatically meet this criteria.
- **ED Capacity** – 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.
- **Ambulance Divert** – If an ambulance is on a patient drop off delay due to a lack of Emergency Department beds or inadequate Emergency Department staff to accept the ambulance patient within 30 minutes of arrival, the hospital will initiate an ambulance diversion protocol for that Emergency Department. Such diversion will be remain until all wiating ambulance patients have been accepted and all ambulances have cleared. This excludes trauma, critical pediatrics, and patients in extremis.

Notes:

- 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.
- It also does not apply to patients meeting pediatric and trauma criteria or in the case of an MCI.
- If patient is en route to a facility and the facility goes on divert, make an appropriate attempt to reroute the patient to the closest ED that is not experiencing diversion. Should that not be possible, due to the patient's condition or other circumstance, the patient in transport will not be rerouted and will proceed to the specific ED that was originally identified.
- If a patient demands transport to a hospital on diversion, or if the patient is refusing transport if they will not be taken to their hospital of choice because of the diversion, the patient will be taken to their hospital of choice. Make every effort to inform the patient of the need to go to a hospital not on divert and document the conversation.

DNR/POLST

Valid POLST indicating DNR or State issued DNR:

- Official document with both patient/legal representative and physician signature on site
- Faxed, copied or electronic version legal and valid
- Verify patient identification
- Verbal instructions from family or friends DO NOT qualify as valid DNR/POLST

Do not resuscitate

Pearls:

- DNR/POLST is **INVALID** if patient indicates they wish to receive life-resuscitating treatment. Document presence of order and how they indicated it was to be revoked. Relay information to future medical providers.
- Family, cannot revoke DNR/POLST unless they hold DPOA/legal guardianship.
- Document presence of a DNR/POLST form with patient's name, physician name and license number if documented.
- POLST provides instruction of degree of resuscitation.
- Nevada providers can accept DNR/POLST of other states.
- If there is concern about the validity of the DNR/POLST begin BLS and contact **Medical Control**.

A Patient Care Record (PCR) will be completed for each incident/patient encounter, in accordance with current agency Policy.

Per the Nevada Administrative Code 450B.180 "Patient" means:
Any person who is sick, injured, wounded, or otherwise incapacitated or helpless and who is carried in an ambulance or air ambulance or is cared for by an emergency medical dispatcher, emergency medical responder, emergency medical technician, advanced emergency medical technician, paramedic or registered nurse.

When providing patient care activities prior to the arrival of the transporting agency, upon the transporting agencies arrival and when prepared to transfer patient care, EMS providers shall provide a verbal report. The verbal report should reflect the patient's status, the treatments that have been accomplished and the potential treatment plan, if necessary. This transfer of care shall be documented in the Patient Care Report (PCR).

Endangerment

NRS 432B.220 Persons required to make report; when and to whom reports are required; any person may make report; report and written findings if reasonable cause to believe death of child caused by abuse or neglect; certain persons and entities required to inform reporters of duty to report.

NRS 200.5093 Report of abuse, neglect, exploitation, isolation or abandonment of older person; voluntary and mandatory reports; investigation; penalty.

Child Report (under 18)

- Contact appropriate Law Enforcement agency if immediate patient protection is needed
- Washoe County Child Protective Services: 775-785-8600
- Complete appropriate agency reporting form

Elder Report (over 59)

- Contact appropriate Law Enforcement agency if immediate patient protection is needed
- Nevada Health and Human Services Aging and Disability Services: (888) 729-0571
- Complete appropriate agency reporting form

For persons over the age of 17 whose present socioeconomic conditions could benefit from additional resources, but do not require mandatory reporting, refer to regional resources guide.

Pearl:

- If there is a high index of suspicion, report to the appropriate agency and allow them to do the investigation.

Inter-facility 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
- Attendant 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 scope, or that the 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 the transport.
- Arterial lines should be discontinued prior to transport unless appropriate personnel from the initiating facility accompany the patient.
- Heparin lock/implantable catheters with/without reservoirs may be closed off and left in place. If they are to be used during transport, then an IV infusion 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 devices(s) in place.
- Trained personnel authorized 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 effect 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.

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 an minor who is at least 16 years of age, who is married or living apart from his or her parents or legal guardian, and who is a resident of the county (NRS 129.080) that petitioned the juvenile court of that county for a decree of emancipation.

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, EMS personnel 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 or sexually transmitted infection

Minors who Refuse Care

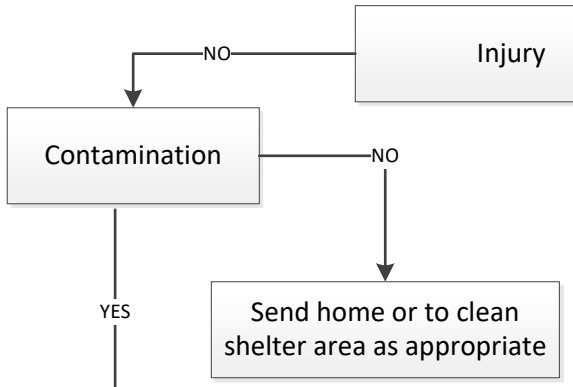
If a non-emancipated minor refuses any indicated treatment or transport, EMS field personnel should:

- 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

Zone	Dose Rate (mR=millirad, R=rad)
Safe	Less than 2x Background Radiation Levels
Rescue Perimeter	Less than 10 mR/hour
Rescue Zone	10–10,000 mR/hour (0.01-10R/hour) *Limit time in zone to minutes only*
Maximum Exposure/Turn Back Rate	
5 R – general operations total dose	Greater than 10 R/h (30 min of non-lifesaving activities)

Radiation initial victim care:

Do not survey victims with serious injury on-scene, remove clothing and cocoon and EMS transport per usual trauma protocols.



Beta / Gamma:	
Less than 10,000 cpm	Home with decon card
10,000 – 25,000 cpm	Dry decon kit / clothing control
Greater than 25,000 cpm	Consider wet decon if weather permits, otherwise dry, re-survey after decon
Greater than 100,000 cpm	Refer to medical facility
* cpm = counts per minute	
Write cpm on patient's arm in permanent marker	

Alpha emitter – NO portal monitors – check facial areas with alpha-capable survey meter and note on victim card / arm where contamination present

Patient	
Green	Yellow / Red (serious injury)
Refer to hospital after clothing removal. May consider initial wet wound decon at scene based on resources	Usual triage / treatment / transport priorities – do NOT survey on scene – hospitals will screen after stabilized – remove clothing and cocoon

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Radiological Response Quick Start Guide

Washoe County
Regional Protocols

If this is a TRANSPORTATION incident involving radiation, proceed down this page

Is this possibly a WMD Event with explosion? Proceed to page 3

<u>Transportation Incidents</u>: The HazMat exclusion zone is 75 feet or twice the background reading.

This must be done correctly to ensure workers returning from inside the Exclusion Zone can be evaluated for contamination.

Medical problems always take priority over radiological concerns

Using the two blanket method, rescue victims from inside the exclusion zone

Go to Page 2

Radiological Response Quick Start Guide

Washoe County
Regional Protocols

From Page 1

After radiation survey meters arrive:

Inside the Exclusion Zone, establish these Radiation Work Zones:

WARM ZONE: YELLOW cones will be placed at 0.5 mrem/hr.

HOT ZONE: RED cones will be place when readings are greater than 2.0 mrem/hr.

Locate Shipping Papers, verify packages & contents

Check:
Transport Index

Package readings

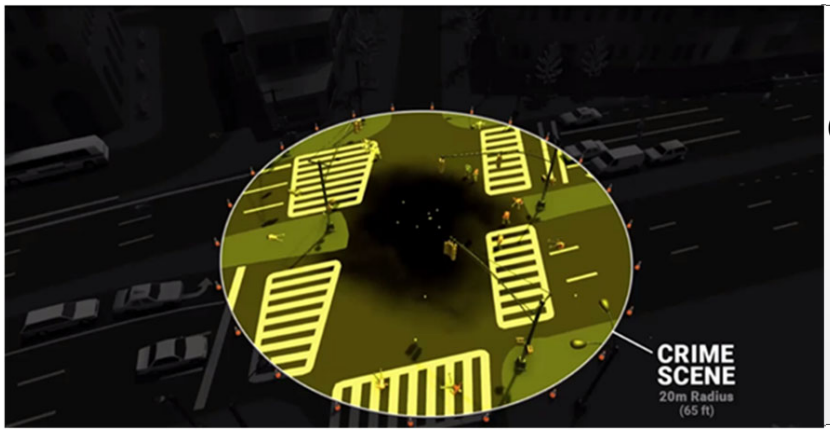
Swipe for contamination

Responders complete decontamination to 1,000 "Counts Per Minute" or less

Suspected WMD Event with Explosion

Life Safety Actions should begin immediately.

- **First responders should not delay life saving measures waiting for radiation monitoring.**
- **Second arriving resources should have a personal dosimeter on and functioning when entering the scene.**
- **<u>Obtain the FEMA 100-minute Radiological Dispersal Device (RDD) Guide early in the incident.</u>**



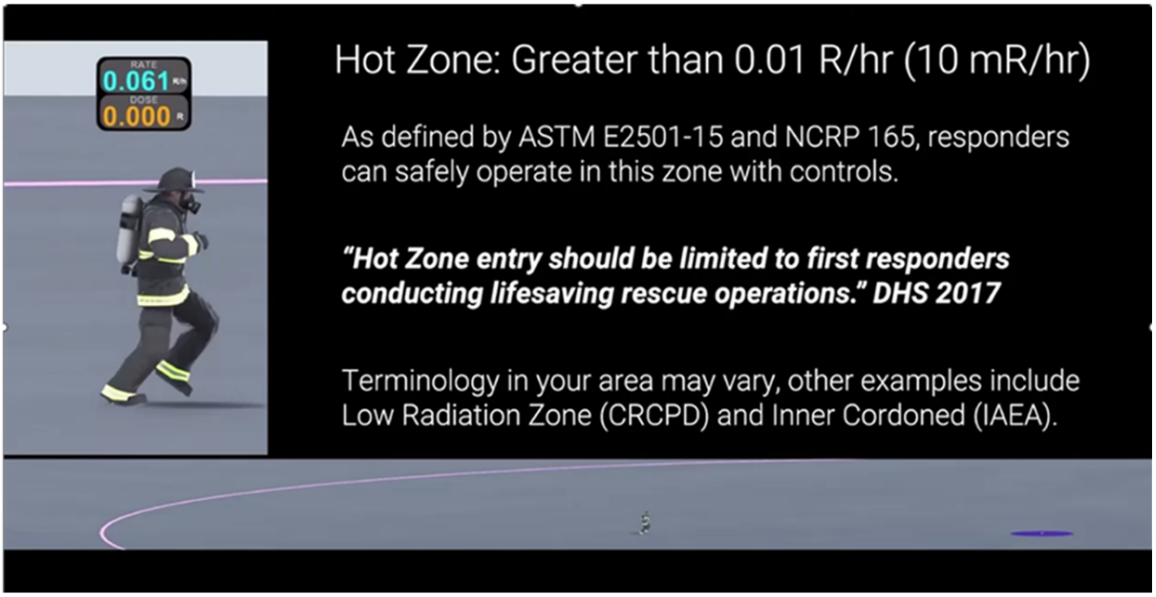
Crime scene: (65 foot radius from blast center)

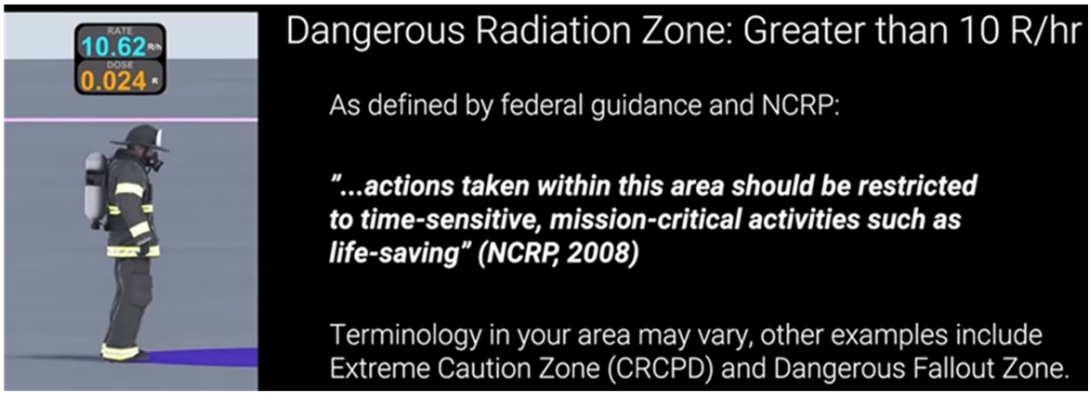
Do not enter this area unless necessary for life safety/rescue

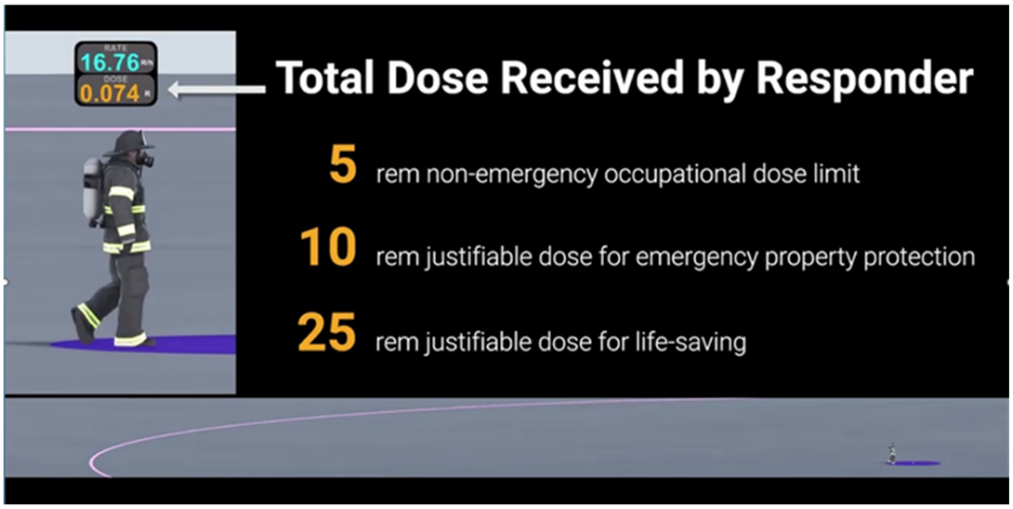
<u>Default EXCLUSION ZONE is 800 Feet from a large blast if no radiation detector is present.</u>

If a personal dosimeter (Canberra) begins to alarm in the operations area, responders should relay those readings back to the IC. The IC will request a second reading, from a different device, at least 50 feet away from the first reading. If a second reading is verified, the IC will establish a HazMat Branch and a "Contamination Reduction Corridor" will be established. Responders and public will be screened for radiation upon exiting the area.

Initial Shelter in Place of 1600 Feet with significant smoke and/or dust cloud. This information will need to be pushed out through "Perimeter" or similar notification system.


RATE
0.061
DOSE
0.000
Hot Zone: Greater than 0.01 R/hr (10 mR/hr)
As defined by ASTM E2501-15 and NCRP 165, responders can safely operate in this zone with controls.
"Hot Zone entry should be limited to first responders conducting lifesaving rescue operations." DHS 2017
Terminology in your area may vary, other examples include Low Radiation Zone (CRCPD) and Inner Cordoned (IAEA).


RATE
10.62
DOSE
0.024
Dangerous Radiation Zone: Greater than 10 R/hr
As defined by federal guidance and NCRP:
"...actions taken within this area should be restricted to time-sensitive, mission-critical activities such as life-saving" (NCRP, 2008)
Terminology in your area may vary, other examples include Extreme Caution Zone (CRCPD) and Dangerous Fallout Zone.


RATE
16.76
DOSE
0.074
Total Dose Received by Responder
5 rem non-emergency occupational dose limit
10 rem justifiable dose for emergency property protection
25 rem justifiable dose for life-saving

Radiological Response Quick Start Guide

This guide is intended to be used by first responders for determine initial actions on a radiological emergency. Please consult the full guides for further information:

FEMA 100 Minute Guide

Community Reception Center

Unsolicited Medical Intervention

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, which does not allow you to take an order for care from any physician other than an on-duty base station physician or your Medical Director. 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 EMS provider
- Is authorized by the base station physician
- Is capable of delivering more extensive emergency medical care at the scene

If the on-scene physician assumes patient management, he/she accepts responsibility for patient care until the transfer of care is made to the receiving hospital's physician. This requires the physician to accompany the patient to the emergency department.

If the physician assumes this responsibility, he/she must document this by handwriting their note on a hospital chart form upon arrival at the Ed and sign accordingly. The completion of the physician's note will become part of the patient's hospital record, and the medic should document the completion of this note in the patient's ePCR along with the physician's name and medical license number, if possible. The narrative of the ePCR should reflect what care was performed by the physician upon assuming care.

A physician who has initiated care of a patient before arrival of EMS personnel has accepted responsibility for the management of the patient. EMS personnel should offer all appropriate assistance and support within their scope of practice. Consultation with the base physician should be made to manage conflicts in patient management.

If a physician other than the EMS Medical Director assumes case of the patient, use agency specific procedures for reporting.

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Appendix A:

Medications

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Adult Medications

The following are the authorized medications used by EMS providers in Washoe County. Licensed EMS providers working under the agency permit are authorized, within their level of certification and training, to administer medications as directed by the written treatment protocols.

It is important to note that some dosages and processes vary on an agency basis. It is imperative that each EMS provider is aware of their agency's internal procedures.

Medication	Indication/Protocol	Dose/Route
Acetaminophen	**A)** Pain Management **B)** Sepsis (Fever)	**A) 1000 mg PO/IV** **B) 1000 mg PO**
Adenosine	**A)** Cardiac - Narrow Complex Tachycardia	**A) 6 mg rapid IVP followed by 20 mL flush, repeat 12 mg x 2 PRN**
Albuterol	**A)** Respiratory Distress /Asthma/COPD/Reactive Airway Disease **B)** Allergic Reaction/Anaphylaxis **C)** Hyperkalemia	**A) 2.5 mg/3 cc Nebulized repeat PRN** **B) 2.5 mg/3 cc Nebulized repeat PRN** **C) 2.5 mg/3 cc Nebulized repeat PRN**
Amiodarone	**A)** Cardiac – Arrest (pVT, VF) **B)** Cardiac - Wide Complex Tachycardia	**A) 300 mg IV/IO, may repeat 150 mg for sustained VT/VF in 3-5 min** **B) 150 mg IV/IO over 10 min**
Aspirin	**A)** Acute Coronary Syndrome (Suspected)	**A) 324 mg PO**
Atropine Sulfate	**A)** Cardiac - Bradycardia **B)** Overdose/Poisoning (Organophosphate Poisoning)	**A) 1.0 mg IVP, may repeat q 3-5 min to max 3 mg** **B) 1-2 mg q 3-5 mins until secretions cease**
Calcium Chloride	**A)** Hyperkalemia **B)** Overdose/Poisoning (Calcium Channel Blocker OD **Call for order**)	**A) 5-10 mL 10% slow IV/IO over 5 min** **B) 250-500 mg slow IV/IO**
Dextrose	**A)** Hypoglycemia	**A) Oral Glucose 15 gm PO PRN** **B) 12.5-25 gm D50% IV/IO, reassess/repeat PRN** **AND/OR** **125 mL D10% IV/IO, reassess/repeat PRN**
Diltiazem	**A)** Cardiac - Narrow Complex Tachycardia **Call for order**	**A) 15-20 mg IV/IO over 5 min; after 15 min, if not resolved, 20-25 mg over 5 min** **Maintenance infusion 5-15 mg/hr titrated to heart rate**
Diphenhydramine	**A)** Allergic Reaction/ Anaphylaxis/Dystonia	***A)*** **25-50 mg IV/IM/PO for *Mild Allergy/Anaphylaxis*** **25-50 mg slow IV push for *Moderate or Severe Allergy/Anaphylaxis*** **25-50 mg IM/IV for *Dystonia***
Dopamine Hydrochloride	**A)** Shock - Cardiogenic **B)** Cardiac - Bradycardia **C)** Cardiac - Post Arrest Care	**A) 5-20 mcg/kg/min IV/IO infusion** **B) 2-10 mcg/kg/min IV** **C) 5-10 mcg/kg/min IV**

Medication	Indication/Protocol	Dose/Route
Dropiderol	**A)** Behavioral Emergency **B)** Nausea/Vomiting	**A) 2.5-5 mg slow IV/IO/IM q 5 min; max 10 mg** **B) 0.625-1.25 mg slow IV/IO/IM may repeat x1 in 10 min** **Geriatric:** **0.625 mg slow IV/IO/IM may repeat x1 in 10 min**
Duoneb	**A)** Respiratory Distress	**A) 0.5 mg IPRATROPRIUM and 3.0 mg ALBUTEROL SULFATE in 3 mL**
Epinephrine	**A)** Cardiac - Arrest (VF, pVT, TdP, Asystole) **B)** Allergic Reaction/ Anaphylaxis **C)** Respiratory Distress	**A) 1 mg 1:10,000 IV/IO q 3-5 mins; ETT 2.5 mg 1:1,000** **B) Moderate Allergic Reaction: 0.3 mg 1:1,000 IM** **Severe Allergic Reaction: 0.1 mg 1:10,000 IV repeat x 3 followed by 100 mL NS.** **C) 0.3-0.5 mg 1:1,000 IM; 0.1 mg IV 1:10,000 repeat as needed, max 0.3 mg**
Epinephrine Infusion	**A)** Cardiac - Bradycardia **B)** Cardiac - Post Arrest Care **C)** Sepsis **D)** Shock - Cardiogenic	**A) 2-10 mcg/min IV/IO infusion** **B) 2-10 mcg/min IV/IO infusion** **C) 2-10 mcg/min IV/IO infusion** **D) 2-10 mcg/min IV/IO infusion**
Etomidate	**A)** Sedation **B)** Medication Assisted Intubation	**A) 0.15 mg/kg IV/IO may repeat once if inadequate sedation** **B) 0.3 mg/kg IV/IO may repeat one time to a max total dose of 0.6 mg/kg**
Fentanyl	**A)** Pain Management **B)** Medication Assisted Intubation	**A) 0.5-1.5 mcg/kg IV/IO/IN/IM, may repeat q 5 min** **B) 1-3 mcg/kg IV/IO**
Furosemide	**A)** Pulmonary Edema	**A) 40 mg IV or double home dose up to 80 mg IV**
Glucagon	**A)** Hypoglycemia **B)** Overdose/Poisoning (Beta Blocker Overdose **Call for order**)	**A) 1 mg IM** **B) 3-5 mg IV/IO**
Haloperidol	**A)** Behavioral Emergency	**A) 5-10 mg IV/IM q 5-10 mins, max 15 mg**
Hydrocortisone Sodium Succinate	**A)** Acute Adrenal Crisis	**A) 100 mg IV/IO/IM; IM is preferred method of administration**
Hydroxocobalamin (Cyanokit)	**A)** Smoke Inhalation (Suspected Cyanide Poisoning)	**A) 5 gm IV over 15 minutes**
Ibuprofen	**A)** Pain Management	**A) 600 mg PO**
Ipratropium Bromide	**A)** Respiratory Distress	**A) 0.5 mg/2.5 mL 2nd and 3rd HHN**

Medication	Indication/Protocol	Dose/Route
Ketamine	**A)** Behavioral Emergency	**A) 1 mg/kg IV may repeat once after 5 minutes; or 3 mg/kg IM; Max dose 300 mg**
	B) Pain Management	**B) 0.3 mg/kg IV/IO/IM/IN may repeat q 10 min as needed; Max dose 30 mg**
	C) Sedation	**C) 1 mg/kg IV/IO may repeat once after 5 minutes; 3 mg/kg IM as single dose**
	D) Medication Assisted Intubation	**D) 1-3 mg/kg IV/IO**
Ketorolac (Toradol)	**A)** Pain Management	**A) 15 mg IV/IM may repeat 1 time**
Levophed	**A)** Cardiac – Post Arrest Care	**A) 2 – 20 mcg/min IV/IO infusion**
	B) Sepsis	**B) 2 – 20 mcg/min IV/IO infusion**
	C) Shock - Cardiogenic	**C) 2 – 20 mcg/min IV/IO infusion**
Lidocaine	**A)** Cardiac – Arrest (pVT, VF) ***Routine use of Lidocaine not recommended***	**A) 1-1.5 mg/kg IV/IO, followed by 0.5-0.75 mg/kg IV/IO q 5 min to 3 mg/kg max** **If patient converts, Lidocaine Infusion 2-4 mg/min IV/IO; ETT 3 mg/kg, repeat once.**
	B) Cardiac – Wide Complex Tachycardia	**B) 1-1.5 mg/kg IV/IO slow push; maintenance infusion 2-4 mg/min**
Magnesium Sulfate	**A)** Cardiac - Torsades de Pointes	**A) 2 gm IV/IO over 5 mins**
	B) Respiratory Distress	**B) 2 gm IV over 20 mins**
	C) Seizure (Suspected Eclamptic Seizure)	**C) 4 gm IV/IO over 20 mins**
Methylprednisolone	**A)** Respiratory Distress	**A) 125 mg IV/IO**
	B) Allergy/Anaphylaxis	**B) 125 mg IV/IO**
	C) Acute Adrenal Crisis	**C) 125 mg IV/IO/IM**
Metoprolol	**A)** Acute Coronary Syndrome (STEMI patient with SBP> 140 & HR >100 **Call for order**)	**A) 5 mg slow IV push**
	B) Cardiac – Narrow Complex	**B) 5 mg IV/IO**
	C) Acute Aortic Dissection **Call for order**	**C) 5 mg slow IV push**
Midazolam (Versed)	**A)** Behavioral Emergency	**A) 2-5 mg slow IV/IO/IM/IN q 5 minutes, titrated to effect, total dose 10 mg**
	B) Sedation (Cardioversion, Pacing, Post-Intubation, Anxiety)	**B) 0.5 mg-5 mg IV/IO/IM/IN**
	C) Seizures	**C) 2-5 mg IV/IO/IM/IN q 5 min, max total dose 10 mg**
	D) Medication Assisted Intubation	**D) 2-10 mg IV/IO may repeat with 2-5mg IV/IO if inadequate relaxation**
	E) Hypothermia Post ROSC	**E) 2-5 mg IV/IO; titrate to effect**
Morphine Sulfate	**A)** Pain Management	**A) 1-5 mg IV/IO q 10 mins**
Naloxone (Narcan)	**A)** Poisoning/Overdose	**A) 0.5 mg-2 mg IV/IO/IM/IN may repeat to max total dose of 10 mg**
Nitroglycerin	**A)** Acute Coronary Syndrome	**A) If SBP > 100: 0.4 mg SL, may repeat q 5 min until pain free, consider 1 inch NTG paste if transport time > 15 mins**
	B) Pulmonary Edema	**B) If systolic BP:** **> 100, 0.4 mg SL q 5 min** **≥ 160, 0.8 mg SL q 5 min** **If diastolic BP > 100: 1.6 mg SL** **1 inch NTG paste if SBP ≥ 100**

Medication	Indication/Protocol	Dose/Route
Nitrous Oxide	**A)** Pain Management	**A) As long as patient is able to follow directions, if available**
Ondansetron (Zofran)	**A)** Nausea/Vomiting	**A) 4 mg IV/IO/IM/PO, may repeat once**
Oxytocin	**A)** Childbirth - Uncontrolled Postpartum Hemorrhage	**A) IV infusion 20 units in 1000 mL NS; Give 10 units (500 mL) over 10-20 minutes, then maintenance infusion 2.5 units (125 mL) per hour**
Promethazine (Phenergan)	**B)** Nausea/Vomiting	**B) 12.5 mg deep IM, may repeat x 1 in 15 mins** **Geriatrics:** **6.25 mg deep IM x 1, no repeat**
Sodium Bicarbonate	**A)** Crush Injury (Rhabdomyolysis Prevention) **B)** Hyperkalemia (Suspected) **C)** Overdose/Poisoning (Tricyclic Antidepressant Overdose)	**A) 1 mEq/kg in 1000 mL NS wide open** **B) 1 mEq/kg infusion over 5 mins** **C) 1 mEq/kg slow IV push**
Tetracaine	**A)** Ocular Injury	**A) 1-2 drops per eye, repeat PRN**
Thiamine	**A)** Hypoglycemia with chronic alcoholism/malnutrition	**A) 100 mg slow IV/IM**
Tranexamic Acid	**A)** Shock – Hemorrhagic **B)** Traumatic Cardiac Arrest	**A) 1 g slow IV/IO push over 1-2 minutes** **B) 1 g IV/IO**

Pediatric Medications

The following are the authorized medications used for pediatric patients by EMS providers in Washoe County. Licensed EMS providers working under the agency permit are authorized, within their level of certification and training, to administer medications as directed by the written treatment protocols.

It is important to note that some dosages and processes vary on an agency basis. It is imperative that each EMS provider is aware of their agency's internal procedures.

Medication	Indication/Protocol	Dose/Route
Acetaminophen	**A)** Pediatric Fever **B)** Pain Management and Sedation	**A) 15 mg/kg PR/PO** **B) 15 mg/kg PO**
Adenosine	**A)** Cardiac - Narrow Complex Tachycardia	**A) 0.1 mg/kg rapid IVP followed by 10 cc flush, repeat 0.2 mg/kg x 2 PRN**
Albuterol	**A)** Allergy/Anaphylaxis **B)** Respiratory Distress/Asthma	**A) 2.5 mg in 3 cc Nebulized repeat PRN** **B) 2.5 mg in 3 cc Nebulized repeat PRN**
Amiodarone	**A)** Cardiac – Arrest (pVT, VF, TdP) **B)** Cardiac - Wide Complex Tachycardia	**A) 5 mg/kg IV/IO, repeat twice for sustained VT/VF; max 15 mg/kg** **B) 5 mg/kg IV/IO over 20 mins**
Atropine Sulfate	**A)** Cardiac - Bradycardia **B)** Overdose/Poisoning (Organophosphate Poisoning)	**A) 0.02 mg/kg IV/IO q 5 mins, min single dose 0.1 mg, max single dose 0.5 mg, ETT 0.04 mg/kg** **B) 0.02 mg/kg IV/IO q 3-5 mins until cessation of secretions**
Calcium Chloride	**A)** Overdose/Poisoning (Calcium Channel Blocker OD **Call for order**)	**A) 20 mg/kg slow IV/IO**
Dextrose	**A)** Hypoglycemia	**A) ≤ 28 days: D10, 2 mL/kg IV/IO/UV** **> 28 days: D10 or D25 2 mL/kg IV/IO** **Max single dose 25 gm**
Diphenhydramine	**A)** Allergy/Anaphylaxis	**A) 1 mg/kg IV/IO/IM/PO, max 25 mg for *Mild Allergy/Anaphylaxis*** **1 mg/kg IV, max 25 mg for *Moderate or Severe Allergy/Anaphylaxis***
Duoneb	**A)** Respiratory Distress	**A) 0.5 mg IPRATROPRIUM and 3.0 mg ALBUTEROL in 3 mL.**

Medication	Indication/Protocol	Dose/Route
Epinephrine	**A)** Cardiac - Bradycardia	**A) 0.01 mg/kg IV/IO q 3-5 mins, max 1 mg** **ETT 1:1000 0.1 mg/kg**
	B) Cardiac - Arrest (VF, pVT, TdP, Asystole)	**B) 0.01 mg/kg 1:10,000 IV/IO, 0.1mg/kg** **1:1,000 ETT q 3-5 mins**
	C) Allergy/Anaphylaxis	**C) <u>Moderate Allergic Reaction</u>:** **0.01 mg/kg 1:1,000 IM, max 0.3 mg** **<u>Severe Allergic Reaction</u>:** **0.01 mg/kg 1:10,000 IV/IO followed by 20 mL/kg NS, repeat PRN**
	D) Respiratory Distress/Asthma	**D) <u>Moderate</u>:** **0.01 mg/kg 1:1,000 IM q 15 mins, max 0.3 mg** **<u>Impending Respiratory Failure:</u>** **0.01 mg/kg 1:10,000 IV/IO, 1 mg max** **<u>Suspected Croup:</u>** **< 6 months 0.25 mg in 3 cc NS via HHN** **> 6 months 0.5 mg in 3 cc via HHN**
	E) Neonatal Resuscitation	**E) 0.01 mg/kg 1:10,000 IV/IO q 3-5 min as needed**
Fentanyl	**A)** Pain Management	**A) 1 mcg/kg IN/IM/Slow IV/IO, may repeat q 5 as needed**
	B) Medication Assisted Intubation **Call for order**	**B) 1-3 mcg/kg IV/IO**
Glucagon	**A)** Hypoglycemia	**A) < 20 kg: 0.5 mg IM** **> 20 kg: 1 mg IM**
Hydrocortisone Sodium Succinate	**A)** Acute Adrenal Crisis	**A) 2 mg/kg IV/IO**
Hydroxocobalamin (Cyanokit)	**A)** Smoke Inhalation (Suspected Cyanide Poisoning)	**A) 70 mg/kg IV over 15 mins**
Ibuprofen	**A)** Pain Management and Sedation	**A) 10 mg/kg PO**
Ketamine	**A)** Medication Assisted Intubation **Call for order**	**A) 1-2 mg/kg IV/IO**
	B) Pediatric Pain Management	**B) 0.3 mg/kg IV/IO/IM/IN max single dose 30mg, may repeat q 15 as needed**
	C) Sedation	**C) 1 mg/kg IV/IO; may repeat once after 5 minutes; max single dose 50 mg** **OR** **3 mg/kg IM; max single dose 150 mg**
	D) Behavioral Emergencies	**D) 1 mg/kg IV/IO; may repeat once after 5 minutes; max single dose 50 mg** **OR** **3 mg/kg IM; max single dose 150 mg** **Maximum IM of 3ccs for any fluid in single muscle group**

Pediatric Medications

Medication	Indication/Protocol	Dose/Route
Lidocaine	**A)** Cardiac – Arrest (pVT, VF) ***Routine use of Lidocaine not recommended***	**A) 1.0 mg/kg IV/IO If access established after ETT dose, may repeat at 1 mg/kg IV/IO (max 3 mg/kg); 2.5 mg/kg ETT, may repeat x 1. If patient converts after administration, infusion 20-50 mcg/kg/min**
Magnesium Sulfate	**A)** Cardiac – Wide Complex Tachycardia (Torsades de Pointes) **B)** Cardiac – Arrest **C)** Respiratory Distress	**A) 25-50 mg/kg IV max 2 g over 20 minutes** **B) 25-50 mg/kg IV max 2g** **C) 25-50 mg/kg in 100 mL NS IV infusion over 20 minutes, max 2 gm**
Methylprednisolone	**A)** Respiratory Distress – Impending Respiratory Failure **B)** Allergy/Anaphylaxis – Severe **C)** Acute Adrenal Crisis	**A) 1 mg/kg IV/IO** **B) 1 mg/kg IV/IO** **C) 2 mg/kg IV/IO/IM, max 125 mg**
Midazolam (Versed)	**A)** Sedation **B)** Seizure **C)** Medication Assisted Intubation **Call for order** **D)** Cardiac - Wide Complex Tachycardia **E)** Behavioral Emergency	**A) 0.2 mg/kg IV, may repeat as needed** **B) 0.2 mg/kg IV/IO/IN/IM, may repeat in 5 mins** **C) 0.2 mg/kg IV/IO; may repeat if inadequate relaxation** **D) 0.2 mg/kg IV; max single dose 5 mg** **E) 0.2 mg/kg IV/IO/IN/IM; may repeat as needed**
Morphine Sulfate	**A)** Pain Management	**A) 0.1 mg/kg IV/IO/IM max single dose 5 mg, may repeat q 10 as needed**
Naloxone (Narcan)	**A)** Poisoning/Overdose	**A) 0.1 mg/kg IV/IO/IM/IN, max single dose 0.5 mg, may repeat to max dose of 10 mg**
Nitrous Oxide	**A)** Pain Management	**A) As long as the patient is able to follow directions, if available**
Ondansetron (Zofran)	**A)** Nausea/Vomiting	**A) 0.15 mg/kg IV/IO/IM up to max dose 4 mg, may repeat x 1 in 20 mins**
Tetracaine	**A)** Ocular Injury	**A) 1-2 drops per eye, repeat PRN**
Racemic Epinephrine	**A)** Respiratory Distress (Suspected Croup/Epiglottitis)	**A) < 6 months 0.25 mL/3 mL NS HHN** **> 6 months 0.5 mL/3 mL NS HHN**
Sodium Bicarbonate	**A)** Overdose/Poisoning (Tricyclic Antidepressant Overdose)	**A) 1 mEq/kg IV**

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The following section is a reference to medications included by name and dose in the Washoe County Regional protocols; the only purpose of this section is to serve as a reference for the Washoe County Regional Protocols. The formulary may contain information outside of allowed protocols. Individual agencies may or may not utilize these or other approved medications. Please refer to approved medication list included in the appendix of your agency.

ACETAMINOPHEN (TYLENOL)

Pharmacology and Actions

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/Precautions

1. Contraindicated in patients with hypersensitivity to acetaminophen.
2. Avoid concomitant use with ethanol and 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.

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

Stable Narrow Complex SVT

Contraindications/Precautions

1. Second or third degree heart block, poison or drug induced tachycardia.
2. Atrial fibrillation, atrial flutter, or Ventricular Tachycardia will not be converted by Adenosine.
3. Reduce initial dose to 3 mg if given through a central line.
4. Larger doses may be required in patients taking theophylline or caffeine.

ALBUTEROL (PROVENTIL, VENTOLIN)

Pharmacology and Actions

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

Indications

1. Primarily used to treat bronchial asthma, COPD and reversible bronchospasm.

Contraindications/Precautions

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

Side Effects and Special Notes

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

AMIODARONE (CORDARONE)

Pharmacology and Actions

Considered a Class III antiarrhythmic. Complex drug with effects on Sodium, Potassium and Calcium channels as well as alpha and beta adrenergic blocking properties. Thought to prolong the refractory period and action potential duration. Amiodarone has an extremely long half-life (up to 40 days).

Indications

1. Indicated for the treatment of shock, CPR and Vasopressor refractory VF/pulseless VT.
2. Indicated in other life threatening arrhythmias like recurrent and/or hemodynamically unstable VT.

Contraindications/Precautions

1. None in VF/Pulseless VT.
2. Endotracheal administration is contraindicated.
3. May produce vasodilation and hypotension.
4. May have negative inotropic effects.
5. May produce prolonged QT interval.
6. Use with caution in the presence of renal failure.

ASPIRIN

Pharmacology and Actions

Inhibits platelet aggregation and arterial constriction by blocking formation of thromboxane A_2. This reduces overall ACS mortality, reinfarction, and CVA.

Indications

1. Indicated in all patients with ACS.
2. Indicated in any person with symptoms suggestive of ischemic pain.

Contraindications/Precautions

1. Relatively contraindicated in patients with active ulcer disease.
2. Contraindicated in patients with known hypersensitivity to aspirin.

ATROPINE

Pharmacology and Actions

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

Indications

1. Atropine is indicated for symptomatic bradycardia and bradyarrhythmias (junctional or escape rhythm).
2. It is also indicated in cases of organophosphate poisoning.
3. It can be administered prior to endotracheal intubation to diminish secretions and block cardiac vagal reflexes.
4. Excellent for vagally induced bradycardia in pediatric patient being intubated.

Contraindications/Precautions

1. The action of atropine cause mydriasis (dilated pupils).
2. Use with caution in presence of myocardial ischemia.
3. Routine use during PEA or Asystole is unlikely to have therapeutic benefit.
4. Unlikely to be effective for hypoxic bradycardia, Type II AV Block, and Third Degree with wide QRS complexes.

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. Known or suspected hyperkalemia.
2. Hypocalcemia.
3. As an antidote for toxic effects from calcium channel blocker and beta blocker overdose.
4. $MgSO_4$ overdose.

Contraindications/Precautions

1. Hyperkalemia due to digitalis toxicity.
2. Do not mix with Sodium Bicarbonate.

DEXTROSE

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

1. Indicated for the treatment of known hypoglycemia.

Contraindications/Precautions

1. Contraindicated in intracranial or intraspinal hemorrhage.

Side Effects and Special Notes

1. Extremely hypertonic.
2. Should be administered into a rapid-running IV established in a large vein.
3. Inadvertent extravasation will lead to tissue sloughing and necrosis.

DILTIAZEM (CARDIZEM®)

Pharmacology and Actions

Diltiazem is a calcium channel blocking agent that inhibits the influx of calcium ions during membrane depolarization of cardiac and vascular smooth muscle. Its action is to slow AV nodal conduction and increase the AV nodal refractory period. Diltiazem slows the ventricular rate in patients with a rapid ventricular response during atrial fibrillation or atrial flutter, potentially converts SVT to normal sinus rhythm, and decreases total peripheral resistance in both systolic and diastolic blood pressure.

Indications

1. Narrow complex atrial fib/flutter with rapid ventricular rate (>150 bpm)
2. SVT refractory to Adenosine. Use after Adenosine for refractory reentry SVT with narrow QRS and adequate blood pressure.

Contraindications/Precautions

1. Patients with impaired left ventricular function or heart failure.
2. Complete heart block.
3. Recently (within past 1 hours) received IV ß-blocker.
4. Patients with WPW and Afib.
5. Sick sinus syndrome.
6. Vtach, wide complex tachycardia, drug/poison induced tachycardia
7. Cautious use in patients with CHF, monitor for signs of pulmonary edema.
8. Cautious use in patients who are already taking antihypertensive medications, monitor for hypotension.

Side Effects and Special Notes

1. Hypotension
2. Bradycardia
3. Heart block

DIPEHNHYDRAMINE 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 the bronchial tubes, gastrointestinal tract, uterus and blood vessels.

Indications

1. One of the most widely used antihistamines for the treatment of anaphylaxis and several allergic reactions.
2. Also used to treat motion sickness and extrapyramidal symptoms.

Contraindications/Precautions

1. Contraindicated in acute asthmatic attack.
2. Should be used cautiously in glaucoma, 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 10 mcg/kg per minute, marked individual variation exists and dose must be guided by clinical response).

Indications

1. Indicated for augmentation of cardia 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/Precautions

1. Contraindicated in patients with uncorrected tachyarrhythmias, ventricular/fibrillation or known hypersensitivity.
2. Should be used cautiously in patients with peripheral vascular disease.
3. Any underlying hypovolemia must be corrected, if possible, prior to use.

Side Effects and Special Notes

1. The principal adverse effects include headache, anxiety, tachycardia, chest pain, hypotension, nausea and vomiting.
2. Carefully monitor blood pressure, ECG and urine output throughout the infusion.
3. Extravasation requires discontinuation of the drug.

DOPAMINE INFUSION 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 gtts/min using 60 gtts/ml set.

	Dopamine dosage in mcg/kg/min					
Weight (kg)	**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

DROPERIDOL

Pharmacology and Actions

Droperidol is a butyrophenone closely related to Haloperidol. It produces a dopaminergic blockage, a mild alpha-adrenergic blockage, and causes peripheral vasodilation. Its major actions are sedation, tranquilization, and potent anti-emetic effect. Onset 3-10 minutes after IM administration. Duration: 2-3 hours.

Indications

1. Sedation of severely agitated/combative patients
2. Nausea/Vomiting

Contraindications/Precautions

1. Contraindicated for patients presenting with suspected MI, uncorrected hypotension, respiratory depression, known hypersensitivity.
2. Avoid use with known prolonged QT interval
3. Use caution with frail or elderly patients who are at increased risk for prolonged and over-sedation as well as increased risk of hypotension.
4. Do not administer concurrently with Haloperidol or Promethazine.

Side Effects and Special Notes

1. Can cause transient hypotension and/or tachycardia that is usually self-limiting. May be treated with IV fluids.
2. Some patients may experience akathisia manifested as restlessness, hyperactivity, or anxiety following administration. This can be treated with Diphenhydramine.
3. Extra-pyramidal reactions have been noted hours to days after administration and can be treated with Diphenhydramine.

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

1. Indicated in cardia arrest, post cardiac arrest, sepsis, bradycardia, distributive shock, bronchial asthma, croup, anaphylaxis and hypotension.

Contraindications/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.
3. Higher doses may be required to treat poison or drug induced shock.

EPINEPHRINE INFUSION CHART

Amount to infuse ml/hr		
Dose Ordered (mcg/min)	1mg/100 mL or 10 mg/1000 mL (10 mcg/mL)	2 mg/250 mL or 4 mg/500 mL (8 mcg/mL)
2	12	15
3	18	23
4	24	30
5	30	38
6	36	45
7	42	53
8	48	60
9	54	68
10	60	75

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 0.3 mg/kg, 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

1. Medication assisted intubation
2. Sedation

Contraindications/Precautions

1. Know hypersensitivity to the drug.

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 injections 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

1. Relief of severe acute and severe chronic pain.

Contraindications/Precautions

1. Contraindicated in patients with known tolerance to the drug.
2. Additive effects when given with CNS depressants, general anesthetics, hypnotics, MAO inhibitors, other narcotic analgesics, sedatives, and tricyclic antidepressants.

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.

FUROSEMIDE (LASIX)

Pharmacology and Actions

Furosemide is a diuretic that works in the loop of henle. The onset of diuresis following IV administration is within five minutes, with the peak effect occurring within the first half hour.

Indications

1. Furosemide is the indicated therapy in acute pulmonary edema.

Contraindications/Precautions

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

Side Effects and Special Notes

1. 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

1. Hypoglycemia.
2. Beta blocker and calcium channel blocker overdose/poisoning.

Contraindications/Precautions

1. 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.

HALOPERIDOL (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

1. Management of psychotic disorders.

Contraindications/Precautions

1. Known hypersensitivity to medication.
2. Coma or CNS depression.

Side Effects and Special Notes

1. Extrapyramidal reactions
2. Tardive dyskinesia
3. Sedation
4. Tachycardia
5. Hypotension
6. 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

1. Deep vein thrombosis
2. Pulmonary emboli
3. Myocardial infarction
4. Open heart surgery
5. Disseminated intra vascular clotting syndrome (DIC)
6. Atrial fibrillation with embolization
7. Prevention of DVT/P.E.

Contraindications/Precautions

1. Hypersensitivity
2. Hemophilia
3. Leukemia with bleeding
4. Peptic ulcer disease
5. Severe hepatic disease
6. Severe HTN

Side Effects and Special Notes

1. Monitor for bleeding gums, petechiae, ecchymosis, black tarry stools, hematuria, epistaxis and 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 500 mL).

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/Precautions

1. Systemic fungal infections
2. Premature infants and neonates
3. Idiopathic thrombocytopenic purpura
4. Hyperglycemia
5. Hypersensitivity
6. Decreases immune function
7. Contains benzyl alcohol

Side Effects and Special Notes

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

HYDROXOCOBALAMIN (CYANOKIT®)

Pharmacology and Actions

Hydroxocobalamin, the active ingredient in CYANOKIT®, forms a strong bond with cyanide, forming nontoxic cyanocobalamin, and another form of vitamin B12, which is then safely excreted in the urine.

Indications

1. Exposure to fire or smoke in an enclosed area indicated by the presence of soot around the mouth, nose or oropharynx.
2. Suspected Cyanide poisoning.

Contraindications /Precautions

1. Cyanokit® has proven to be incompatible with other drugs; therefore, it should not be administered simultaneously in the same line as other medications, consider initiating two IV lines.
2. Possible allergic/anaphylactic reaction.
3. Substantial increases in blood pressure may occur following Cyanokit therapy.

IBUPROFEN

Pharmacology and Actions

Exact mechanism unknown; inhibits cyclooxygenase, reducing prostaglandin and thromboxane synthesis.

Indications

1. Pain management, anti-inflammatory, fever

Contraindications/Cautions in patients with

1. NSAID or ASA allergy or hypersensitivity
2. Pregnancy with greater than 20 weeks gestation
3. Active internal hemorrhage or active peptic ulcers
4. Perioperative patients
5. Renal or Heptic impairment
6. Hx of bleeding disorders or previous GI bleeding
7. Recent CVA
8. Chronic alcohol use

Side Effects and Special Notes

GI bleeding/ulcers, hepatotoxicity, nephrotoxicity, nausea, abdominal pain, dizziness, rash

IPRATROPIUM BROMIDE (ATROVENT)

Pharmacology and Actions

Anticholinergic bronchodilator

Indications

1. Relief of acute bronchospasm (reversible airway obstruction).

Contraindications/Precautions

1. Allergy or known hypersensitivity to Atrovent.
2. Hypersensitivity to Atropine (chemically related).
3. Those with a history of hypersensitivity to soya lecithin or related food products, such as soy beans and peanuts.
4. Use with caution in patients with heart disease, hypertension, glaucoma and the elderly.
5. Ipratropium may worsen the condition of glaucoma if it gets into the eyes. Having the patient close their eyes during nebulization may prevent this.

Side Effects and Special Notes

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.

KETAMINE

Pharmacology and Actions

Dissociative Anesthetic Agent. It has amnestic and sedative effects, but it also provides analgesia. It has a rapid onset of 45-60 seconds when given IV. Its duration of action is 5-10 minutes IV, or 12-25 minutes IM. Ketamine preserves respiratory drive and is unlikely to cause hypotension. The patient may exhibit behavior consistent with an awake state (eyes open, responds to pain) after receiving Ketamine, but is dissociated from the noxious event, making Ketamine a suitable choice for short-term sedation and analgesia.

Indications

1. Short-term management of pain and anxiety related to noxious events such as pain related injury, immobilization, movement of patient, or manipulation of injured extremities.
2. Indicated for sedation, behavioral emergencies, and medication assisted intubation.

Contraindications/Precautions

1. KETAMINE is inadvisable in those with evidence of head trauma, traumatic mechanism with high likelihood of head trauma or patients with potential acute intracranial pathology otherwise (intracranial hemorrhage, CVA).

Side Effects and Special Notes

1. Patients may have a re-emergence reaction when recovering from Ketamine that manifests as hallucinations or drams that may be unpleasant. In general, this is reduced by concomitant use of benzodiazepines.
2. May cause hypersecretion.
3. Avoid rapid administration of Ketamine IV, which can cause HTN or respiratory depression.

KETOROLAC (TORADOL)

Pharmacology and Actions

KETOROLAC works by reducing hormones that cause inflammation and pain in the body. KETOROLAC is non-narcotic and is not habit-forming. It is 30 times the strength of aspirin. It will not cause physical or mental dependence, as narcotics can. However, KETOROLAC is sometimes used together with a narcotic to provide better pain relief than either medicine used alone.

Indications

Moderate to severe pain secondary to kidney stones, back pain or pain associated with isolated trauma.

Contraindications/Precautions

Do not administer KETOROLAC if the patient has:

1. An allergy to aspirin (ASA) or NSAIDs
2. Woman who is or suspects she may be pregnant
3. Severe renal disease or a kidney transplant
4. A bleeding or clotting disorder
5. Multi-system trauma
6. Injury to the head
7. Suspected or the possibility of developing internal bleeding
8. Stomach ulcer or history of gastrointestinal bleeding
9. Is a possible surgical candidate for presenting injury or illness

Special Considerations

Consider contacting online Medical Control if the patient has a history of liver disease, chronic alcohol abuse, or history of asthma as KETOROLAC can worsen these conditions.

Side Effects

Nausea, vomiting, gastric distress, dizziness, dry mouth, abnormal taste in mouth, blurred vision and drowsiness.

LIDOCAINE (XYLOCAINE)

Pharmacology and Actions

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

Indications

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

Contraindications/Precautions

1. Use 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 benzodiazepines. 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.

LEVOPHED

Pharmacology and Actions

For blood pressure control in certain acute hypotensive situations.
As an adjunct in the treatment of cardiac arrest and profound hypotension.
Stimulates alpha and beta-1 adrenergic receptors; produces inotropic and vasopressor effects.

Indications

1. Hypotension absent hypovolemia
2. Sepsis (shock)
3. Cardiogenic shock
4. Distributive shock

Contraindications/Precautions

1. Volume depletion
2. Vascular thrombosis
3. Profound Hypoxia
4. Hypercarbia
5. Hypersensitivity

Side Effects and Special Notes

HTN, arrhythmias, bradycardia, ischemic injury, asthma exacerbation, anaphylaxis and extravasation necrosis.
Category C. Use with caution if benefits outweigh risks. Animal studies show risk in pregnancy.
Not recommended in children.

1. Cardiovascular reactions are usually depressant in nature and are characterized by bradycardia, hypotension and cardiovascular collapse.

LIDOCAINE JELLY

Pharmacology and Actions

Elicits local anesthesia.

Stabilizes the neuronal membrane by inhibiting the ionic fluxes required for the initiation and conduction of impulses.

Indications

1. Anesthetic lubricant for intubation

Contraindications/Precautions

1. Hypersensitivity

Side Effects and Special Notes

1. Cardiovascular (with excessive systemic absorption)
2. CV depressant
3. Bradycardia
4. Hypotension
5. Cardiovascular collapse

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

1. Pregnancy induced hypertensive disorders (preeclampsia or eclampsia) to prevent convolutions. May transiently lower blood pressure at therapeutic levels. Can also be used as a tocolytic in pre-term labor.
2. May be used in irretractable ventricular tachycardia/fibrillation, especially in Toursade's de Pointes.
3. Ventricular arrhythmias associated with digitalis toxicity.
4. Respiratory distress secondary to asthma refractory to other medications.

Contraindications/Precautions

1. Use cautiously in patients with renal failure.

Special Notes and Side Effects

1. Monitor respiratory rate every 5 minutes. For respiratory depression, discontinue Magnesium infusion and maintain airway/ventilation as needed.
2. Monitor blood pressure every 15 minutes.
3. Monitor reflexes every 30 minutes. If absent or hyper-reactive, after standard regimen, call physician.
4. 1-2 grams of Calcium Gluconate or Calcium Chloride is the physiologic antidote for Magnesium Sulfate toxicity.

METHYLPRENISOLONE (SOLU MEDROL)

Pharmacology and Actions

Methylprednisolone is a synthetic steroid with potent anti-inflammatory properties. It is related to the natural hormones secreted in the adrenal cortex.

Indications

1. Severe allergic reactions, impending respiratory failure associated with asthmatic attacks and bronchospasm associated with COPD that do not respond to other treatments.

Contraindications/Precautions

1. Contraindicated in known hypersensitivity.
2. Should be used with caution in pregnant patients and patients with GI bleeding. It should also be used with caution in patients with diabetes mellitus, as hypoglycemic responses to insulin and oral hypoglycemic agents may be blunted. Hold steroids for suspected pneumonia, CHF or “metabolic hyperventilation” (DKA, sepsis, etc.).
3. A single dose is all that should be given in the prehospital setting. Long-term steroid therapy can cause gastrointestinal bleeding, prolonged wound healing, and suppression of adrenocortical steroids.

Side Effects and Special Notes

1. Fluid retention
2. Congestive heart failure
3. Hypertension
4. Abdominal distention
5. Vertigo
6. Headache
7. Nausea
8. Malaise
9. Hiccups

Potassium-depleting agents may potentiate hypokalemia induced by corticosteroids.

The pharmacological effects of steroids are vast and complex. Effective as anti-inflammatory agents, they are used in the management of allergic reactions, asthma, and anaphylaxis. Methylprednisolone is considered an intermediate-acting steroid with a plasma half-life of 3 to 4 hours.

METOPROLOL

Pharmacology and Actions

Selectively antagonizes beta 1-adrenergic receptors. Half-life is 3-7 hours.

Indications

1. AMI

Contraindications/Precautions

1. Hypersensitivity to drug/class/component
2. Sinus bradycardia
3. HR < 45 bpm (MI, acute)
4. AV block, 2nd or 3rd degree
5. AV block, PR interval > 0.24 sec (MI, acute)
6. Heart failure, uncompensated
7. Heart failure, mod-severe (MI, acute)
8. SBP < 100 mmHg (MI, acute)
9. Cardiogenic shock
10. Sick sinus syndrome w/o pacemaker

Side Effects and Special Notes

1. CHF
2. Heart block
3. Bradycardia, severe
4. Raynaud's phenomenon
5. Bronchospasm
6. Hypersensitivity reaction
7. Hepatitis (rare)

MIDAZOLAM (VERSED)

Pharmacology and Actions

Versed is a short acting benzodiazepine with CNS depressant and anti-seizure actions.

Indications

1. Agent for short periods of sedation and to reduce agitation
2. Seizures

Contraindications/Precautions

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

Side Effects and Special Notes

1. Constant monitoring of cardiopulmonary status of patient required.
2. For short term sedation and not the drug of choice when long term sedation is required.

MORPHINE SULFATE

Pharmacology and Actions

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

1. Relief of severe acute and severe chronic pain.
2. May be used for ischemic pain in ACS unrelieved by nitrates.
3. Acute cardiogenic pulmonary edema.

Contraindications/Precautions

1. Use caution in the patient with RV infarction.

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 depressions, 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 opioid narcotic analgesics from their receptors (competitive antagonism).

Indications

1. Known or suspected opioid induced respiratory depression.

Contraindications/Precautions

1. 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 awaken suddenly and become extremely combative.
2. The duration of the narcotic may exceed that of Naloxone. Re-administration may be necessary.

NITROGLYCERINE (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 nervous and pulmonary capillary wedge pressures, pulmonary vascular resistance and systemic vascular resistance are also reduced.

Indications

1. Myocardial ischemia
2. Malignant hypertension
3. Congestive heart failure

Contraindications/Precautions

1. Contraindicated in patients with known hypersensitivity, hypotension, uncorrected hypovolemia, increased intracranial pressure, inadequate cerebral circulation, and pericardial tamponade.
2. Contraindicated with phosphodiesterase inhibitors (tadalafil within 48 hours and sildenafil/vardenafil within 24 hours).
3. Contraindicated in patients with RV infarction.
4. Maintain systolic and limit blood pressure drop to 30% of pre-treatment blood pressure.

Side Effects and Special Notes

1. Headache is the most frequent adverse reaction.
2. If severe hypotension and reflex tachycardia occurs, decrease 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, then every 15 minutes while infusion continues. Monitor ECG continuously.

NITROGLYCERINE DRIP CHART

Amount to infuse in ml/hr		
Dose Ordered (mcg/min)	50 mg/250 ml 100 mg/500ml (200 mcg/ml)	100 mg/250 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

NITROUS OXIDE

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

1. Broad, first-line for rapid pain relief.

Contraindications/Precautions

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 ready indicating oxygen saturation less than 90% prior to Nitrous Oxide – Oxygen mixture use

Side Effects and Special notes

1. Euphoria
2. Disassociation

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

1. Prevention of nausea and vomiting.

Contraindications/Precautions

1. Known hypersensitivity to the medication.

Side Effects and Special Notes

1. Use cautiously in patients with liver failure.

OXYMETAZOLINE HYDROCHLORIDE (AFRIN)

Pharmacology and Actions

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

Indications

1. Nasal congestion, prior to nasal intubation to lessen the chance of causing and epistaxis.

Contraindications/Precautions

1. Known hypersensitivity to the drug.
2. 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. In hospital - normal postpartum – to produce uterine contractions.
2. Postpartum hemorrhage – to control excessive uterine bleeding when related to recent childbirth.

Contraindications/Precautions

1. 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.

PROMETHAZINE (PHENERGAN)

Pharmacology and Actions

Promethazine is a phenothiazine and acts as an antiemetic.

Indications

1. Prophylaxis and treatment of nausea and vomiting.

Contraindication/Precautions

1. Contraindicated in patients with central nervous system depression.

Side Effects and Special Notes

1. Most common adverse effects are sedation, drowsiness and dry mouth.
2. May cause dystonia and extrapyramidal reactions. Treat both with 25-50 mg Diphenhydramine IV.

POTASSIUM CHLORIDE

Pharmacology and Actions

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

Indications

1. Used for the treatment of hypokalemia.

Contraindications/Precautions

1. Severe renal impairment with oliguria and anuria.
2. 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 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 20 mEq per hour should have continuous ECG monitoring.
5. Treat hyperkalemia: 1 gm Calcium Chloride + 5 units regular insulin + 50 gm Glucose

RACEMIC EPINEPHRINE (VAPONEPHRIN)

Pharmacology and Actions

Effects are those of Epinephrine. Inhalation causes local effects on the upper airway as well as systemic effects from absorption. Vasoconstriction may reduce swelling in the upper airway and beta effects on bronchial muscle may relieve bronchospasm.

Indications

1. Treatment of life-threatening airway obstruction in croup.

Contraindications/Precautions

1. Use with caution in patients with cardiovascular disorders including coronary insufficiency and hypertension.

Side Effects and Special Notes

1. Adverse effects of Racemic Epinephrine include tremor, nervousness, tachycardia, palpitations and occasionally hypertension. Since these are also symptoms of hypoxia, be sure to monitor the patient closely.
2. Racemic Epinephrine is heat and light sensitive. If the solution is discolored, it should be discarded.
3. Clinical improvement in croup can be dramatic after administration of Racemic Epinephrine. Rebound worsening of airway obstruction can occur, however, in one to four hours. Many patients require admission after administration.

TETRACAINE

Indications

1. Provides anesthesia prior to ophthalmic procedures, such as irrigation.

Contraindications/Precautions

1. 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

1. Acidosis that accompanies shock and cardiac arrest.
2. Treatment of tricyclic antidepressant overdose.
3. Preexisting or life threatening hyperkalemia.
4. Crush injuries to prevent Rhabdomyolysis.

Side Effects and Special Notes

1. 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

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

Contraindications/Precautions

1. 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.

TRANEXAMIC ACID

Pharmacology and Actions

Tranexamic acid is a synthetic analog of the amino acid lysine. It serves as an antifibrinolytic by reversibly binding four to five lysine receptor sites on plasminogen. This reduces the conversion of plasminogen to plasmin, preventing fibrin degradation and preserving the framework of fibrin's matrix structure.

Indications

1. Suspected or impending hemorrhagic shock with time of onset < 3 hours

Contraindications/Precautions

1. Known hypersensitivity
2. No other contraindications in the acutely hemorrhaging patient
3. Rapid administration may cause hypotension

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Appendix B:

Community Resources

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Call 2*1*1 or text your 5-digit zip code to TXT211 (898211) for resources in your community.

ADOLESCENTS

Big Brothers Big Sisters of N. Nevada 775-352-3202
Big Brothers Big Sisters – *Carson City and Douglas* 775-283-0606

Child Find *Established to help identify the un-served child* 775-327-0685

Child Nutrition & School Health Access to variety of nutritious foods promoting student health 775-687-9144

Children's Cabinet – *Reno* 775-856-6200
Children's Cabinet – *Carson City* 775-684-0880
Counseling, respite care, day care, parenting classes, family counseling

Eddy House *Walk-in Center: 888 Willow St, Reno* 775-384-1129
Center for youth who aged out of foster services. Walk-in center for runaways, homeless, foster, & at-risk youth in downtown Reno

Family Resource Center Info 775-856-6200
Centers: N. Valleys, NE Reno, Sparks and Sun Valley

Jan Evans Juvenile Justice Center – *650 Ferrari McLeod Blvd., Reno* 775-325-7800
(Espanola 325-7801 or 325-7811 24-hours)
Juvenile Services – *Carson City* 775-887-2033
Juvenile Probation and Detention – *Douglas County* 775-586-7210

National Runaway Switchboard 800-786-2929
Here for you when looking for a place to run away or if you're a run away and ready to go home

Nevada Youth Empowerment *Transitional housing for youth 18-24 years old* 775-747-2073

OUR Center S*upport center for LGBTQA community, 1745 South Wells Ave, Reno* 775-624-3720

Safe Talk for Teens 775-823-2700
Safe confidential support for teens, provides resources for additional support

Solace Tree 775-324-7723
Support for grieving children, teens and families, 1300 Foster Drive, Ste 200, Reno

Tag – Transgender Allies Group *316 California Ave, Ste 146, Reno* See Emails
Director: sherrie@transgenderalliesgroup.org or brooke@transgenderalliesgroup.org

Quest Counseling 775-786-6880
Adolescent substance abuse and family services, 3500 Lakeside Ct #101, Reno

Washoe County Social Services *350 S Center St, Reno* 775-785-8600
Carson City, Douglas, Storey County Social Services 775-684-4400
Investigates reports of child abuse, emergency shelter for children

Willow Springs *960 Edison Way, Reno* 775-858-3303
Residential treatment center for youth & teens Washoe County

AIDS/HIV

Northern Nevada Hopes *W. 5th St., Reno* *Counseling, referrals, medical services*	775-786-4673
Sida Informacion/Spanish Aids Hotline	800-344-7432
National Aids Hotline	800-232-4636
OUR Center *www.OurCenterReno.org 1754 S Wells Ave, Reno*	775-624-3720

ALCOHOL – DRUGS

Al-Anon adult/children	775-348-7103
Alcohol & Drug Treatment Hotline	800-ALCOHOL
Alcoholics Anonymous, 24 hours – *Washoe County* *AA 24 hour line can obtain bi-lingual assistance*	775-355-1151
Alcoholics Anonymous – *Carson City*	775-882-0443
Bristlecone Family Resource Centers *Help with drugs, alcohol, gambling and tobacco*	775-954-1400
Northern Nevada Al-Anon Info *Help for families and friends of alcoholics*	775-348-7103
NV DUI Task Force *Provide resources to DUI victims/families*	775-348-4664
ReSTART *Substance abuse counseling, life skills, parenting classes, transitional/supportive housing, limited rental funds*	775-324-2622
Ridge House *Resident and outpatient treatment*	775-322-8941
Salvation Army – *Washoe County* Salvation Army – *Carson City* *Disaster assistance to needy families, substance abuse, basic services*	775-688-4555 775-887-9120
The Empowerment Center *Safe & sober housing & support services*	775-853-5441
Well Care *Community triage center for those participating in outpatient services*	775-538-6700
Step 2 Rehabilitation for Women	775-787-9411
Substance Abuse Prevention	775-825-4357

BEREAVEMENT – GRIEF

Bereavement: the process of living with the loss of a loved one. Grief is the deep and poignant reaction to death – unique to each person.

Circle of Life Community Hospice 775-827-2298
Grief support group with various meeting days & times

Compassionate Friends – *Washoe County* 775-750-7005
Compassionate Friends – *Carson City (Thomas)* 775-461-0362
Grief/bereavement support for the loss of a child of any age, compassionatefriends.org

First Candle National Warmline 800-221-7437
For parents who have lost an infant to SIDS, miscarriage or still birth
Sara Brundage hablar espanol – available after 2 pm west coast time

Grief Recovery Group *$40 per week* 775-972-9408

Grief Share Meeting Groups:
- Centerpoint Christian Fellowship – *Dayton* 775-246-4108
- Colony Community Fellowship 775-324-0324
- Grace Community Church 775-747-9000
- Hilltop Community Church – *Carson City* 775-267-3020
- Hope Community Church 775-284-4673
- Reno Christian Fellowship 775-853-4234
- Sparks Christian Fellowship 775-331-2303

Renown Hospice 775-982-2828
Support group meets bi-weekly

Renown Spiritual Office 775-982-7729

St. Mary's Medical Center Spiritual Office 775-770-3734
Support at schools & community sites for people of all ages
St. Mary's Hospice (N. Nevada - Tears and Rainbows) 775-770-3081

Summit View Hospice *Grief & bereavement support open to all* 775-636-9598

The Solace Tree 775-324-7723
Support for grieving children, teens, and their families, facing or living with death

Vitas Healthcare *Grief & bereavement resources & support groups (virtual & phone-in)* 866-489-0583

BOARD UP SERVICES

Local fire departments provide board up services for fire victims. See Clean-Up Services for abatement companies providing board-up.

Affordable Glass 775-527-3615

BURIAL & CREMATION ASSISTANCE

Each agency provides similar services for vastly different prices. Call around.
Burial Assistance for infants (0-1 year): www.thetearsfoundation.org

Washoe County Social Services – Burial Assistance *Provides cremation/burial assistance to indigent families*	775-328-2700
Funeral Consumers Alliance of Nevada (FCAN) *FCAN provides listings for Carson City & Truckee as well as price Information for burial, cremation & memorial parks*	775-329-7705
Affinity Burial & Cremation *644 S Wells Ave, Reno*	775-322-9200
Capitol City Cremation and Burial Society *1614 North Curry Street, Carson City*	775-882-1766
Eastside Memorial Park (Douglas County) *1600 Buckeye Rd, Minden*	775-782-2215
Fitzhenry's *3945 Fairview Dr, Carson City*	775-882-2644
John Sparks Memorial Society *644 Pyramid Way, Sparks*	775-331-1112
LaPaloma Burial & Cremation *5301 Longley Lane #180, Reno* LaPaloma Funeral Services Northwest *437 Stoker Ave, Reno*	775-827-3700 775-335-1010
Lone Mountain Cemetery (Carson City) *1044 Beverly Drive, Carson City*	775-887-2111
Masonic Memorial Gardens *437 Stoker Avenue, Reno*	775-329-2635
McFarlane Mortuary *887 Emerald Bay Rd, S Lake Tahoe*	530-541-3095
Mountain View Mortuary & Cemetery *425 Stoker Avenue, Reno*	775-788-2199
Neptune Society *5890 S. Virginia St Ste 4E, Reno*	775-525-3533
Northern Nevada Memorial *8056 S. Virginia St #3, Reno*	775-322-2772
O'Brien, Rogers and Crosby (Walton's) *600 W. 2nd Street, Reno*	775-323-6191
Our Mother of Sorrows Catholic Cemetery 2700 N. Virginia, Reno	775-323-0133
Ross Burke and Knobel – Reno (Walton's) *2155 Kietzke Lane, Reno* Ross Burke and Knobel – Sparks (Walton's) *1538 C Street, Sparks*	775-323-4154 775-329-0440
Sierra Memorial Gardens *142 Bell Street, Reno*	775-323-1835
Simple Cremation *7111 S Virginia St Ste A-17, Reno* Simple Cremation *1016 N. Rock Boulevard, Sparks*	775-324-3720 775-335-0001
Truckee Meadows Cremation & Burial *616 S. Wells Ave., Reno*	775-324-4611
Veteran's Memorial Cemetery *14 Veteran's Way, Fernley*	775-575-4441
Walton's Funerals and Cremations - Chapel of the Valley *1281 N. Roop Street, Carson City* Walton's Sierra Chapel *875 W. 2nd Street, Reno* Walton's Funeral Home – Sparks *1745 Sullivan Lane, Sparks*	775-882-4965 775-323-7189 775-359-2210

CLEAN UP SERVICES

A-1 Clean the Scene	888-867-2141
Affordable Glass	775-527-3615
Belfor Property Restoration	775-424-3200
Bio-One & Trashout	775-686-3174
Coit – Certified Techs Clean Them All	775-322-4266
Empire Cleaning & Restoration Services *(24-hour)*	775-747-8441
H2O Environmental Trauma & Crime Scene	775-351-2237
Nevada Water & Fire Restoration	775-856-6666
ServPro of Southwest Reno *(Reno/Sparks/Carson)*	775-852-6480

CLOTHING – FOOD – SHELTER

American Red Cross	775-856-1000
Carson Valley Community Food Closet	775-782-3711
Catholic Community Services of Northern Nevada *Basic services agency open to all who qualify financially*	775-322-7073
Food Bank of Northern Nevada	775-331-3663
Hosanna Home *Christian home for WOMEN in transition*	775-232-5416
Salvation Army – *Washoe County* Salvation Army – *Carson City & Douglas County* *Disaster assistance to needy families, substance abuse, basic services*	775-688-4555 775-887-9120

CORONER – MEDICAL EXAMINER

Carson City Sheriff's Office	775-887-2500
Douglas County Sheriff's Sub-Station	775-782-9925
Storey County Sheriff's Office	775-847-0959
Washoe County Medical Examiner (Coroner)	775-785-6114

COUNSELING – MENTAL HEALTH

Most of the following providers offer a sliding fee scale. Call 211 for more listings.

Alliance Family Services		775-337-2394
American Comprehensive Counseling Services (ACCS) – *Washoe County*		775-356-0371
American Comprehensive Counseling Services (ACCS) – *Carson City*		775-883-4325
Crisis Support Services of NV *24/7 free, confidential, & caring support to those in crisis*		800-273-8255
www.cssnv.org or text CARE to 839863		775-784-8090
Healing Minds C*ounseling services www.healingminds.com/grief-counseling-reno-nv*		775-448-9760
Empowerment Therapy Group – *Jeanette Bussey*		775-232-7659
Family Counseling & Consumer Credit Services *(East Plumb Ln) -$80 initial visit, sliding scale*		775-329-0623
Frank Lemus*, Spanish speaking counselor*		775-323-1330
Mojave Adult, Child & Family Services		775-334-3033
Non Profit Affiliate of UNR School of Medicine for children & families with serious mental illness or psychiatric disability		
National Alliance on Mental Illness – Warmline *Stigma-free non-crisis phone service you can call or text*		775-350-7977
www.namiwesternnevada.org/online-resources		
National Association on Mental Illness NV Chapter		775-322-1346
Available to speak to callers & provide weekly support group(s) for mentally ill people & their friends and families		
Northern Nevada Adult Mental Health		775-688-2001
In-patient, outpatient, outpatient pharmacy, rehab & counseling programs		
Northern Nevada HOPES *Medical & mental health*		775-786-4673
Quest Counseling		775-786-6880
Adolescent substance abuse & family services		
Reno-Sparks Gospel Mission Counseling		775-323-0386
Extension 13 or 0 – Low cost Christian counseling, individual and families		
Something To Believe In Counseling *Specializing in EMDR therapy & PTSD*		775-870-6552
Veteran's Center *Many resources for VETERANS including PTSD counseling*	775-323-1294 or	988 x1
Confidential chat: veteranscrisisline.net or text 838255		
Victims of Crime Treatment Center *Multiple locations*		775-682-8684

COURTS

Carson City Justice Court *885 E. Musser Street, Ste 2007, Carson City* 775-887-2121

Nevada Department of Motor Vehicles 775-684-4368

East Fork Justice Court *1038 Buckeye Road, Minden*

Reno Justice Court *One South Sierra Street, Reno* 775-325-6501

Second Judicial District Court 775-328-3110
Family Division: One South Sierra Street, Reno; General Jurisdiction: 75 Court Street, Reno

Sparks Justice Court *630 Greenbrae Drive, Sparks* 775-353-7600

Sparks Municipal Court *1450 C Street, Sparks* 775-353-2286

Storey County District Court *26 S. B Street, Virginia City* 775-847-0969

CRISIS – DISASTER SERVICES

American Red Cross 775-856-1000

Crisis Support Services of Nevada 800-273-8255 or 775-784-8090
Referrals for people of all ages & victims of all traumas, including sexual assault, rape and individuals and families facing suicide attempt or death by suicide.

National Red Cross 800-733-2767

Red Cross Español 800-257-7575

Salvation Army 775-688-4555

Suicide Prevention Hotline 988

Veteran's Suicide Prevention Coordinator 988 x1
Confidential chat veteranscrisisline.net or text to 838255

DEATH CERTIFICATES

Birth & Death Certificates – *Washoe County - 9th & Wells in building B, Reno* 775-328-2455
Call for most current FEE for birth/death certs.

DOMESTIC VIOLENCE

Abuse and Neglect Hotline			775-785-8600
Committee to Aid Abused Women www.caaw.org			775-329-4150
Crisis Call Center	800-273-8255	or	775-784-8090
Defense Sexual Assault HOTLINE			887-995-5247
Hosanna House Female shelter (must be sober)			775-232-5416
National Domestic Violence Hotline			800-799-7233
Nevada Coalition to End Domestic & Sexual Violence			775-828-1115
Safe Embrace Family violence intervention program, 24-hour crisis intervention, support groups			775-322-3466
Sierra Community House			530-546-0952
Tahoe Safe Alliance			800-736-1060
Temporary Protection Order (TPO) Office – Washoe County			775-328-3468
Temporary Protection Order (TPO) Office – Carson City			775-884-1886
Victims of Crime Treatment Center			775-682-8684

DOMESTIC VIOLENCE SHELTERS

Committee to Aid Abused Women (CAAW)	775-329-4150
Safe Embrace	775-322-3466
Volunteers of America - *Women's Shelter*	775-329-4145
Volunteers of America - *Men's Shelter*	775-329-4141
Volunteers of America - *Family Shelter*	775-322-9574
Veteran's Shelter *non-emergency (ext. 11761)*	775-786-7200

DOMESTIC VOILENCE V.I.N.E. INFORMATION

Victim Information & Notification Everyday (VINE) 888-268-8463
Call from anywhere in Nevada for FREE ANONYMOUS information & notification on custody status of offenders. Service is available 24/7/356.
Online at www.vinelink.com

FAMILIES

Big Brothers Big Sisters of Northern Nevada	775-352-3202
Boys & Girls Club of Truckee Meadows *Before & after school care, sports leagues, education, & healthy meals for kids/teens*	775-322-9030
CARES Campus *Emergency shelter for men, women, couples, pets*	775-329-4141
Catholic Charities of Northern Nevada *St. Vincent Food Pantry: Corner of Fourth & Valley, Reno* *Emergency Assistance for Families, dial x230 or x221*	775-322-7073
Central Reno Family Resource Center	775-204-1408
Community Services Agency *Head Start pre-school, employment training & assistance, computer classes, etc.*	775-786-6023
Disability Resources *For adults, children and their families*	775-329-1126
Family Ties of NV *Family to family health info center (connecting special needs families to support)*	775-823-9500
Hope Springs *Bridge-housing community, pets accepted*	775-786-4673
Kids to Senior Korner *Community based outreach to families, children & seniors*	775-432-9165
Nevada Urban Indians *Native American resources/clinic*	775-788-7600
North Valleys Resource Center	775-677-5437
Northeast Reno Family Resource Center *Bernice Matthews Elem. School, El Rancho Drive, Reno*	775-353-5563
OUR Center *Support for LGBTQA community*	775-624-3720
Resettlement and Placement	775-784-7515
Salvation Army *Emergency food, clothing, antibiotics*	775-688-4559 x243
Sparks Family Resource Center	775-204-1408
Sun Valley Family Resource Center	775-204-1408
Victims of Crime Treatment Center	775-682-8684
Village on Sage Street *Transitional temp housing (18+)*	775-499-5198
Washoe County Human Services *Health, medical, housing & death related services*	775-328-2081
Washoe County Senior Services *Health, medical, housing & death related services – SENIORS*	775-328-2575
Washoe Caregivers *www.washoecaregivers.org*	775-333-5499

FIRE – SUPPORT SERVICES

American Red Cross *4750 Longley Ln Ste 101, Reno 89502*	775-856-1000
Board Up Services: 1-800-BOARDUP	800-262-7387
Carson City Fire Department *non-emergency #*	775-887-2210
City of Reno Fire Department *non-emergency #*	775-334-2300
City of Sparks Fire Department *non-emergency #*	775-353-2259
Disaster Clean Up	800-232-4636
Douglas County Fire (East Fork Station) *non-emergency #*	775-782-9040
Hazardous Materials/Washoe County Environmental	775-328-2434
Storey County Fire Department *non-emergency #*	775-847-0954
Truckee Meadows Fire Protection District *non-emergency #*	775-326-6000

HEALTH

American Foundation for the Blind				800-232-5463
American Heart Association				800-242-8721
American Kidney Fund				800-638-8299
Cancer Information Service				800-422-6237
C*A*R*E* Chest				775-829-2273
Carson City Health and Human Services				775-887-2190
Children's Tumor Foundation				800-323-7938
Community Health Alliance	775-324-2599	or	775-329-6300 or	775-825-6702
Douglas County Community Health				775-782-9038
Juvenile Diabetes Research Foundation				800-533-2873
National Alliance on Mental Illness Nevada (NAMI)				775-336-3090
National Down Syndrome Society				800-221-4602
Nevada Diabetes Association				775-856-3839
Nevada Public Health Foundation				775-884-0392
Nevada Urban Indians *Open to general public for mental/clinical/substance abuse/victim services; sliding fee*				775-788-7600
Northern Nevada HOPES *Medical & mental health*				775-786-4673
Northern Nevada Public Health				775-328-3400
Poison Control Center				775-732-4989
Prescription Discount Card - ***FREE*** *for everyone*			Pharmacies:	877-435-7977
Immediate use: ***BIN*** *610194 /* ***GROUP ID*** *39800 /* ***PCN*** *FW /* ***Cardholder ID*** *091510 / www.familywize.com*				
Renown Medical Clinic *Locust St, Reno*				775-982-5270
Ronald McDonald House Charities				775-322-4663
TMCC Disability Resource Center				775-673-7277
Veteran's Center *(Readjustment Counseling)* AFTER HOURS: 1-877-WAR-VETS (877-927-8387) or *PTSD counseling for vets*				775-323-1294
Vocational Rehabilitation for Women				775-623-6544
Washoe Caregivers *www.washoecaregivers.org*				775-333-5499

HOUSING SERVICES

CARES Campus *emergency shelter for men, women, couples, pets*	775-329-4141
Community Health Improvement Plan	775-324-2599
Eddy House *Transitional housing for youth 18-24*	775-686-6244
Healthcare for Homeless Vets *350 Capital Hill*	775-324-6600
Hope Springs *Bridge-housing community, dogs accepted*	775-786-4673
Hosanna House *Female shelter (must be sober)*	775-232-5416
Men's Crossroads *Supportive housing for men*	775-785-4006
Nevada Job Connect – *Reno*	775-284-9600
Nevada Job Connect – *Sparks*	775-284-9520
Nevada Job Connect – *Carson City*	775-684-0400
Resume assistance, computer, copier and fax for job seekers	
Nevada Youth Empowerment *Transitional housing for youth 18-24*	775-240-2195
OUR Place *Housing for women & children*	775-327-7501
Project RESTART	775-324-5166
RPD H.E.L.P. Officer Cell number	775-321-8330
Homeless Evaluation Liaison Program/Assistance in reconnecting homeless people with their support systems/families	
Reno Sparks Gospel Mission *Long-term residential housing for women*	775-323-0386
Resource Center *Mail, computer, internet, phone, benefits information and referrals*	775-657-4675
STEP 2 *Transitional housing for substance abuse history*	775-787-9411
Village on Sage Street *Transitional/tem housing (18+)*	775-499-5198
Women's Crossroads *Supportive housing for women/women with children*	775-337-4548

HOSPITALS

Carson Tahoe Regional Medical Center	775-445-8000
Carson Valley Medical Center	775-782-1500
ER @ Damonte Ranch	775-567-6900
ER @ McCarran Northwest	775-900-6700
ER @ Spanish Springs	775-567-5400
Incline Village Community Hospital	775-833-4100
Northern Nevada Medical Center *(ER 775-356-4040)*	775-331-7000
Renown Regional Medical Center *(Urgent Care 775-982-5000)*	775-982-4100
Renown South Meadows	775-982-7000
Saint Mary's Regional Medical Center *(ER 770-3188)*	775-770-3000
Sierra Medical Center *(ER 775-799-7399)*	775-799-7320
Veteran's Hospital *(ER 775-786-1138)*	775-786-7200

LANGUAGE

Northern Nevada International Center *www.unr.edu/languagebank*	775-784-7515

LEGAL AID

Child Welfare Services Attorneys	775-337-5700
Douglas County Public Administrator	775-267-4321
Lawyer in the Library *(10 minutes free)*	775-328-3250
Nevada Legal Services *Reno*	775-284-3492
Nevada Legal Services *Carson City*	775-883-0404
State of Nevada Public Administrator – *Carson City*	775-887-2260
Storey County District Attorney	775-847-0964
Washoe County Public Administrator	775-861-4000
Washoe County Senior Law Center	775-328-2575
Washoe Legal Services	775-329-2727

MILITARY/VETERANS

American Legion, Post 1 *Meets 1st Tuesday each month @ 7pm*		775-786-1996
American Red Cross ** (ARC) Disaster Services		877-272-7337
American Red Cross - *Reno*		775-856-1000
Counseling and Group for Veterans		775-323-1294
Day Labor Veteran Rep *420 Galletti Way, Reno*		775-687-4727
Disabled American Vets (DAV) *975 Kirman Ave 5th floor of VA Hospital*		775-321-4895
Free Bereavement		877-726-4727
Healthcare for Homeless Vets *350 Capital Hill, Reno*		775-324-6600
Nevada Department of Veterans Services *6630 s McCarran Blvd Bldg C Ste 204, Reno*		775-688-1653
Northern Nevada Veteran's Memorial Facility - *Fernley*		775-575-4441
Office of Military Legal Assistance *100 North Carson St, Carson City*		775-684-1216
Reno VA Hospital *975 Kirman Ave, Reno*		775-786-7200
Reno Vet Center *5580 Mill Street Ste 600, Reno*		775-323-1294
U. S. Army Recruiting Company Sierra Nevada		775-333-2826
VA Regional Office *5460 Reno Corporate Dr, Reno*	775-321-4885 or	775-321-4880
VA Sierra Nevada Healthcare System		775-786-7200
Veteran Resource Center *1835 Montello St, Reno*		775-432-6012
Vitality Veterans *Transitional housing for vets*		775-673-3800

***** Call ARC to notify active duty member of the military of the status of a loved one (emergency, serious illness, or death).***

Be prepared to provide the following information:

- *Name of military service member*
- *Rank and branch*
- *Social Security number*
- *Date of birth*
- *Overseas – unit*
- *Military duty address stateside - base*

PET SERVICES

A Beloved Friend's Pet Cremation *Pickup at any location & returns remains within 24 hours*	775-825-9900
Nevada Humane Society *Animal help desk*	775-856-2000 x200
Pet Loss Support Group *NW Reno Library*	775-342-7040
Shakespeare Fund *Financial assistance with pet expenses*	775-342-7040
Washoe County Animal Services *Office / dispatch*	775-322-3647
Washoe County Animal Services *Shelter facility*	775-353-8900

POLICE

California Highway Patrol	800-835-5247
Carson City Sheriff's Office	775-887-2500
Douglas County Sheriff's Office	775-782-9925
Nevada Highway Patrol	775-688-2500
Pyramid Lake Paiute Tribe Police Department	775-574-1014
Reno Police Department	775-334-2121
Reno Police Victim Services Unit (VSU)	775-657-4519
Reno Public Safety Dispatch (non-emergency)	775-334-2677
Reno-Sparks Tribal Police	775-323-2677
Reno Tahoe Airport Police	775-328-6600
Sparks Police Department	775-353-2231
Storey County Sheriff's Office	775-847-0959
Truckee Meadows Community College Police	775-674-7900
Truckee Police Department	530-550-2323
University of Nevada Reno Police Department	775-784-4013
Washoe County Sheriff's Office	775-328-3001

SENIOR CITIZEN SERVICES

Access to Healthcare			877-385-2345
Carson City Senior Center			775-883-0703
Disabled American Veterans, DAV			775-336-7053
Division for Aging Services – Reno			775-688-2964
Douglas County Community & Senior Center – Gardnerville			775-782-5500
Douglas County Senior Center – Minden			775-783-6455
Eldercare Hotline			800-677-1116
Kids to Senior Korner Community based outreach to families, children & seniors			775-432-9165
Lifeline Low cost / free lifeline systems			855-332-7799
Medicare Ship Medical help line: 877-385-2345			800-633-4227
Memory Care / Alzheimer's Association of Northern Nevada			775-786-8061
Nevada Department of Veteran Services			775-321-4880
Office of Consumer Health Assistance			888-333-1597
Sanford Center for Aging Comprehensive geriatric assessment & support center			775-784-4774
Seniors in Service: Foster grandparent program, senior companion program, caregiver voucher program			775-358-2322
Senior RX / Disability RX	866-303-6323	or	775-687-0539
Social Security Administration (SSA) 1170 Harvard Way, Reno	800-772-1213	or	888-808-5481
Tahoe-Douglas Senior Center			775-588-5140
Washoe County Senior Services			775-328-2575

Call 211 for more senior services: Adult daycare, companion programs, respite care, housing, activities, employment, Alzheimer's & dementia & chore services

SEXUAL ASSAULT – RAPE

Rape, Abuse & Incest National Network 800-656-4673

Safe Embrace Emergency shelter for female victims 775-322-3466

Sexual Assault Support Services (SASS) 800-992-5757 or 775-784-8090
Advocacy team provides immediate crisis intervention services for survivors of sexual assault, their family members & friends

Sexual Assault Survivor Group Ages 13-18 775-772-3263 or 775-322-6462
Group meets every Monday from 5:30 – 7:00 p.m. $50 / session – sliding fee. Victims of Crime funding accepted

Victims of Crime Treatment Centers 775-682-8684

SHELTERS

Cares Campus Shelter 775-329-4141

Volunteers of America - *Women's shelter* 775-329-4145

Volunteers of America – *Men's Shelter* 775-329-4141

Volunteers of America – *Family Shelter* 775-322-9574

Committee to Aid Abused Women (CAAW) 775-329-4150

SUDDEN UNEXPLAINED INFANT DEATHS

Burial assistance for infants (0-1 year): *www.thetearsfoundation.com*

Perinatal Bereavement Support Group 775-982-5769
For parents who have lost an infant due to miscarriage, stillbirth, or sudden unexplained infant death

First Candle 800-221-7437

First Candle – Kathleen 702-301-3417

Compassionate Friends – *Carol (Carson City)* 775-813-0828
Compassionate Friends – *Delores (Reno)* 775-849-1979
Support for parents who have lost a child of any age

SUICIDE – ATTEMPTS & COMPLETED

Suicide Prevention & Crisis Hotline	775-784-8090
Suicide Hotline *For anyone affected by suicide*	988
Survivors of Suicide Support *Janett, group leader & suicide survivor. Meets every Monday evening in Reno area*	775-784-8085
Veterans Suicide Support *Confidential chat veteranscrisisline.net or text to 838255*	988 x 1

VICTIM SERVICES (CRIME RELATED)

Nevada Department of Corrections Victim Advocate	775-887-3393
Sparks Police Department Victim Advocate	775-353-2217
Victims of Crime *Northern Nevada*	775-687-8428
Victims Services (VSU) – Reno Police Department	775-657-4519
VINE *24-hour inmate status hotline; information also available online at www.vinelink.com*	877-332-8463
Washoe County Sheriff's Office Victim Advocate	775-325-6454

REMSA Health Procedure By Provider Level

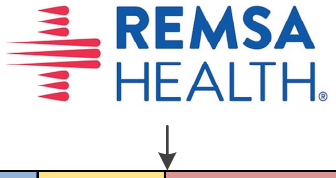
Washoe County Regional Protocols - REMSA Health

Procedure	BLS	ILS	ALS	CCT
AED Application/AED Defibrillation	X	X	X	X
Airway Suction (Non-Sterile)	X	X	X	X
BLS Airway Adjunct (NPA/OPA)	X	X	X	X
BVM/Assist Ventillations	X	X	X	X
CPR/Chest Compressions	X	X	X	X
Medication Administration within Scope	X	X	X	X
Monitor Vascular Access established PTA	X	X	X	X
Oxygen Administration	X	X	X	X
Patient Assessment	X	X	X	X
Pulse Oximetry/CO Monitoring	X	X	X	X
Restraints (physical)	X	X	X	X
Spinal Motion Restriction	X	X	X	X
Splinting (extremity)	X	X	X	X
Stroke Screening	X	X	X	X
Temperature Measurements	X	X	X	X
Tourniquet Application	X	X	X	X
Traction Splint	X	X	X	X
Debrillation w/ ALS Provider; AED Mode Otherwise		X	X	X
Finger Stick Glucose Assessment		X	X	X
Intraosseous Acess: Obtain & Monitor		X	X	X
Intravenous Access: Obtain & Monitor		X	X	X
Supraglottic Airway Placement		X	X	X
Airway Suction (Sterile)			X	X
Capnography			X	X
CPAP			X	X
Defibrillation Manual			X	X
IV Infusion Pump Management			X	X
Monitor & Interpret 4-lead & 12-lead ECG Rhythm			X	X
Monitor Home Vent Patient on a 911 call ONLY			X	X
Needle Thoracostomy			X	X
NG/OG Tube Placement			X	X
Oral Intubation (OTI)			X	X
Surgical Cricothyrotomy			X	X
Synchronized Cardioversion			X	X
Tracheostomy Tube Replacement			X	X
Transcutaneous Pacing			X	X

REMSA Health Procedure By Provider Level

Procedure	BLS	ILS	ALS	CCT
Umbilical Vein Cannulation (UVC)			X	X
Ventilator Management (ALS Care Vent)			X	X
Arterial Lines				X
Arterial Sheaths				X
Balloon Pumps				X
BiPap				X
Central Lines with Swans & CVP's				X
Chest Tube Placements				X
Flolan				X
High Flow Nasal Cannula				X
Impella				X
Transvenous Pacemakers				X
Invasive Monitoring				X
LVAD				X
Pericardiocentesis				X
Simple Thoracostomies				X
Target Temperature Control				X
Ventilator Transfers				X

REMSA Health Medication By Provider Level



Washoe County Regional Protocols - REMSA Health

Medication	BLS	ILS	AEMT with Paramedic	ALS
Aspirin	X	X	X	X
Cool It Spray	X	X	X	X
Epi-Pen (Patient Prescribed)	X	X	X	X
Naloxone Intranasal	X	X	X	X
Nitroglycerine (Patient Prescribed)	X	X	X	X
Oral Glucose	X	X	X	X
Organic Agent Auto-Injector	X	X	X	X
OTC Tylenol & Ibuprofen	X	X	X	X
Oxygen	X	X	X	X
Patient Prescribed Inhaler	X	X	X	X
IV Tylenol		X	X	X
Nitrous Oxide		X	X	X
Ondansetron ODT (PO) *(Single 4mg dose during transport)*		X	X	X
Albuterol			X	X
Dextrose 10%			X	X
Epinephrine in Cardiac Arrest			X	X
Glucagon			X	X
Naloxone (IN, IV, IM, IO)			X	X
Ondansetron ODT (PO)			X	X
Thiamine			X	X
Adenosine				X
Amiodarone				X
Atropine				X
Calcium Chloride				X
Diphenhydramine				X
Dopamine				X
Duoneb				X
Epinephrine				X
Fentanyl				X
Haloperidol				X
Ketamine				X
Lidocaine				X
Magnesium Sulfate				X
Methylprednisolone (Solu-Medrol)				X
Metoprolol				X
Midazolam				X
Morphine Sulfate				X
Nitroglycerine (SL)				X
Norepinephrine				X
Ondansetron (IV, IM, ODT)				X
Oxytocin				X
Promethazine				X
Sodium Bicarbonate				X
Tanexamic Acid				X

REMSA Health IFT Procedure Capabilities & Monitoring By Provider Level

Washoe County Regional Protocols - REMSA Health

Procedure	BLS IFT	911 Ambulance			IFT CCT	CCT (CF)
		BLS	ILS	ALS		
External Orthopedic Appliances:	X	X	X	X	X	X
- Backbrace or HALO Fixator	X	X	X	X	X	X
- C-Collar, Backboard, Spinal Mobile Restriction	X	X	X	X	X	X
- External Fixator Device (Casted or Immobilized)	X	X	X	X	X	X
- Pelvic Binder	X	X	X	X	X	X
- Traction Splint	X	X	X	X	X	X
External Tracheostomy Suctioning	X	X	X	X	X	X
Mental Health Crisis/Legal 2K Hold	X	X	X	X	X	X
Monitor Pre-Existing Vascular Access without Running Infusion	X	X	X	X	X	X
NG/OG/PEG Tube Monitoring without Suction	X	X	X	X	X	X
Oxygen Administration (NC/NRM/Simple Mask/Trach)	X	X	X	X	X	X
Soft Restraints	X	X	X	X	X	X
Suction Oral	X	X	X	X	X	X
Transfer Hemodynamically Stable Patients Post Medication Administration	X	X	X	X	X	X
Urinary Catheter, Suprapubic Catheter, and Nephrostomy Tube Monitoring	X	X	X	X	X	X
Wound Vac Monitoring	X	X	X	X	X	X
Establish and Interpret Pulse Oximetry	X	X	X	X	X	X
Tourniquet Placement	X	X	X	X	X	X
CCT with Team ***(ability to drive lights & sirens)***		X	X	X	X	X
Neonate Transfer with Team ***(ability to drive lights & sirens)***		X	X	X	X	X
Pre-Existing IV Access with Normal Saline & Lactated Ringer's Infusion			X	X	X	X
Blood Glucose Assessment			X	X	X	X
Monitor the Following Pre-Existing Medication Infusions in Addition to Approved List:				X	X	X
-ALL IV Antibiotics				X	X	X
-ALL Other Approved Medications in Formulary				X	X	X
-Dextrose (5%, 10%, 25%, 50%, etc.)				X	X	X
-Diltiazem				X	X	X
-Famotidine				X	X	X
-Heparin				X	X	X
-Hydroxocobalamin (Cyanokit)				X	X	X
-Metoprolol				X	X	X
-Narcan				X	X	X
-Nitroglycerin IV (Tridil)				X	X	X
-Octreotide				X	X	X
-Potassium 40 mEq or Less Diluted in at Least 1000 mL				X	X	X
-Protonix (Pantoprazole)				X	X	X
-TPN				X	X	X
Chest Tube Monitoring with Gravity Drain ***(No Suction)***				X	X	X
OB Emergency (>20 Weeks)				X	X	X
Orotracheal Intubation and/or ***Medication Assisted Intubation (MAI)***				X	X	X

REMSA Health IFT Procedure Capabilities & Monitoring By Provider Level

Washoe County Regional Protocols - REMSA Health

Procedure	BLS IFT	911 Ambulance			IFT CCT	CCT (CF)
		BLS	ILS	ALS		
LMA (Laryngeal Mask Airway) Insertion and Maintenance				X	X	X
Needle/Surgical Cricothyrotomy Per Protocol				X	X	X
Needle Thoracostomy				X	X	X
Suctioning:				X	X	X
-Intratracheal				X	X	X
-Deep Tracheostomy				X	X	X
-NG/OG Tube with Suction				X	X	X
UVC Monitoring/ Insertion				X	X	X
Initiation or Maintenance of Capnography				X	X	X
Defibrillation/ Cardioversion				X	X	X
Transcutaneous Pacing				X	X	X
ECG and 12 Lead Interpretation				X	X	X
Infusion Pump Management				X	X	X
Establish and Maintain PIV Access Including External Jugular				X	X	X
Establish and Maintain IO Access				X	X	X
BiPap					X	X
Blood Transfusion/Blood Products					X	X
CPAP					X	X
High Flow Nasal Cannula					X	X
Hypertonic Saline Infusion					X	X
Insulin Infusion or Dosed					X	X
Transvenous Pacemaker Management					X	X
Invasive Monitoring					X	X
Magnet Reset of Implanted Pacemaker					X	X
Maintenance of Vascular Assist Devices ***Excluding Impella and Balloon Pumps***					X	X
Maintain Chest Tube with Suction					X	X
Maintain Other Tubes and Monitoring Devices Attached or Inserted into Patient ***Excluding EVD***					X	X
Simple Thoracostomy					X	X
Orotracheal Intubation and/or ***Rapid Sequence Induction Intubation (RSI)***					X	X
Mechanical Ventillator Management:					X	X
-Home Vent					X	X
-Adult					X	X
-Pediatric					X	X
All Other Medications with Physician Order					X	X
Impella					X	X
Patients More Than 2 Vasoactive Infusions					X	X
Balloon Pumps					X	X
EVD (External Ventricular Drain) Management					X	X
Chest Tube Insertion					X	X
Flolan					X	X

REMSA Health IFT Procedure Capabilities & Monitoring By Provider Level

Washoe County Regional Protocols - REMSA Health

Procedure	BLS IFT	911 Ambulance			IFT CCT	CCT (CF)
		BLS	ILS	ALS		
Maintenance of Vascular Assist Devices ***Excluding Impella and Balloon Pumps***					X	X
Maintain Chest Tube with Suction					X	X
Maintain Other Tubes and Monitoring Devices Attached or Inserted into Patient ***Excluding EVD***					X	X
Simple Thoracostomy					X	X
Orotracheal Intubation and/or ***Rapid Sequence Induction Intubation (RSI)***					X	X
Mechanical Ventillator Management:					X	X
-Home Vent					X	X
-Adult					X	X
-Pediatric					X	X
All Other Medications with Physician Order					X	X
Impella					X	X
Patients More Than 2 Vasoactive Infusions					X	X
Balloon Pumps					X	X
EVD (External Ventricular Drain) Management					X	X
Chest Tube Insertion					X	X
Flolan					X	X

Pearls:

- Should your patient have a **decline OR change in condition during transport,** follow the appropriate treatment pathway:
  - **Cardiac Arrest:**
    - **With DNR:** Contact your On-Duty Supervisor for guidance
    - **Without DNR:** Immediately initiate Resuscitation
  - ALS: Transport to the closest, most appropriate facility
  - ILS/BLS: Request ALS rendezvous and assist responding resource with resuscitation
    - **Out of County/LDT: Initiate resuscitation, pull over to the side of the road, contact 911 for local EMS agency rendezvous**
  - **ALS Complaint Unrelated to Nature of Transfer:**
    - **ALS:** Initiate Treatment, contact the closest facility (sending vs receiving) for further instruction
    - **ILS/BLS:** Initiate Treatment up to your scope of practice, request ALS rendezvous

ILS Unit 911 Response

ILS vs ALS Transport Decision Tree

Establish Chief Complaint

ILS Unit Transport Criteria

- Does not present with the foreseeable need for ALS intervention or EKG monitoring.
- Is not violent and without the foreseeable need for chemical restraints.
- No suspicion of having overdosed or ingested illicit or poisonous substances that could lead to ALOC or CNS Depression.
- **DOES NOT HAVE** the following complaints:
  - Cardiac Chest Pain
  - ACS Complaints
  - Shortness of Breath
  - Active Seizure Like Activity
  - Stroke-Like Symptoms
  - Dizziness
  - Syncope/Near-Syncope
  - Loss of Consciousness
  - ALOC *Off Normal Baseline*
  - Pregnant Patients Over 20 Weeks Gestation ***with*** Obstetric Related Complaint

Transport the patient to their preferred hospital and initiate treatment as indicated up to the attending provider's level of practice

ALS Consult Criteria

- **After assessment of the ILS Crew, determine ALS Intervention or assessment is necessary, request ALS.**
- **If, after assessment, the ALS provider determines the patient meets ILS/BLS criteria, then the ILS Unit may continue with patient care.**
- **If the ALS provider initiates any form of ALS assessment (e.g. 12 lead EKG, ETCO2, etc.) they must maintain patient care.**
- ILS is excluded from transporting or charting AMA/RMA for patients who require ALS assessment or intervention.
- Patients who require ALS intervention PTA of the ILS crew (i.e. the Fire Medic administered narcotic pain medication PTA).

Call for REMSA ALS Rendezvous

If a patient requires ***emergent*** return to the hospital, an ALS Fire resource on scene may transport with the ILS unit **ONLY** if it benefits the patient, doesn't delay care, and reduces time to definitive treatment.

Otherwise, request REMSA ALS for transport.

ILS Unit 911 Response

Treatment & Transport Decision Tree

PATIENTS IN EXTREMIS

Cardiac Arrest

ETA to Closest ED LESS than 5 MIN

- Immediately initiate Healthcare Provider CPR; do not stop the ambulance.
- Continue to the nearest ED.
- Have your partner provide an update on the patient's condition over Med 10.
- Request dispatch to notify the receiving facility of an incoming CPR in Progress.
- At the receiving ED, go out of service and contact the on-duty supervisor for a debrief.
- File an occurrence report.

ETA to Closest ED GREATER than 5 MIN

- Immediately initiate Healthcare Provider CPR.
- Pull over and inform dispatch of the patient's change in condition via Med 10.
- Request Priority 1 ALS or Supervisor rendezvous; dispatch will send the nearest available resource along with Fire Rescue.
- Follow any further instructions from the supervisor, including possibly initiating emergent transport to the closest facility while continuing CPR if your ETA is shorter than that of the next ALS unit.
- If transporting, have dispatch notify the receiving facility of an incoming CPR in Progress via Med 10.
- At the receiving ED, go out of service and contact the on-duty supervisor for a debrief.
- File an occurrence report.

Patients Requiring ALS Treatment

With Prolonged ETA of ALS Resource

- **Immediately request REMSA ALS** resource when it is identified that your patient requires a higher level of care.
- Promptly begin treatment to the highest level of protocol allowances & ability.
- If ALS is unable to make patient contact within 10 minutes OR if the transport time to nearest facility is less than ALS rendezvous response time, expedite transport to the nearest, most appropriate facility.

Patients needing the following medications urgently are considered to be in an emergent crisis. These medications can be initiated by the AEMT provider ***AFTER*** requesting ALS intercept.

- Nitrous Oxide
- Albuterol and/or Duoneb
- Benadryl IM/IV
- Prescribed Epi-Pen
- D10 IV
- Narcan IN/IV
- ASA & Patient Prescribed NTG

If the patient needs an ALS medication not listed here, request REMSA ALS rendezvous at the appropriate priority.

REMSA Resource List

Reporting…2

Social Needs…3

Emergency Shelters...4

Medical Equipment…4

Transportation Resources…5

Primary Care Clinics…6

Reporting

Adult Protective Services Report

Report abuse, neglect, self-neglect, exploitation, isolation or abandonment for vulnerable adults, age 18-59, or any persons 60+

Online Information

If an investigation is opened, a patient will be visited in-home by a social worker within 48hrs. Patients can then be assessed for a variety of needs and resources (meals on wheels, caretaker assistance, housing assistance, life alert, etc).

Business hours (M-F 0800-1700):
775-687-0800: Press #0 then press #2 and ask for the social worker of the day

After Hours/Weekends:
775-687-0800 Press #1 and then #2 to leave a voicemail and receive a call back

Online Report:
Online APS Report

Nevada Care Connect

Online Referral Form

Refer any patient of any age for additional in home services and social services intervention
A referral can connect patients to transportation, basic medical, and food resources.

Child Protective Services Report

Report physical abuse, sexual abuse, emotional abuse, and neglect

Online Information

24/7 Phone repot: 1-833-900-7233

Nevada Division of Public and Behavioral Health Complaint Form

Report healthcare facilities for behavior that could result in possible harm to a patient (ie patient dumping, inappropriate discharge, etc)

HCQC Complaint Form

Social Needs

NAMI Warm Line 775-241-4212
24/7 phone service available to provide stigma-free, non-crisis peer support. Callers speak with a Peer Wellness Operator who can provide support to individuals impacted by mental illness or life stressors

988 Dial 988
National Mental Health hotline
24/7 crisis phone line, text or chat support available to individuals experiencing mental health or substance abuse crisis. Callers are connected to a counselor who can provide additional resources and services

Ambassadors (24/7, Outreach van available 0900-1600)
775-313-4080
Provide homeless outreach services in the Downtown Business Improvement District
-Resources include: van transport to Cares Campus, free bus passes, clean clothes, etc. Van can accommodate wheelchairs but individuals must be able to get in/out of the van Independently

Karma Box Business Outreach
775-799-0496
Provide homeless outreach services on 4th st from Wells to the 580 overpass
-Resources include: (wheelchair) van transport to Cares Campus, bus passes, ID assistance
0600-2200

Mobile Outreach Safety Team (MOST)
-Specialize in de-escalation, write legal holds, provide referrals or follow up with frequent callers with significant behavioral health history
-Operate daily, hours vary
-Always accompanied by officer
-Request through Dispatch
-Use email for non-emergency referrals and include ***HIPAA*** in subject line
Reno
RPDMost@reno.gov
Sparks
SPDsparksmost@cityofsparks.us
Washoe County
MOST@washoecounty.gov

Emergency Shelters

Cares Campus 100 Cares Dr
775-329-4141
Emergency homeless shelter for adult men and couples (women/families referred to Our Place)
-Residents must be able to perform ADLs independently
-Residents are assigned a bed and Case Manager upon intake. Additional resources include: showers, food, lockers, transportation to Well Care

Our Place 605 S 21st St
775-327-7501
Women's emergency shelter and resource center
-Residents must be able to perform ADLs independently
-Resources: Case management, therapists, on-site medical clinic once a week, laundry, transportation staff & bus passes, 3 meals a day

Eddy House 888 Willow St
775-384-1129
Shelter and day use center for homeless or at-risk youth
-Resources: shelter, life skills classes, workforce development, healthcare assistance, counseling, etc

Medical Equipment

Care Chest 775-829-2273
Free/low cost DME (durable medical equipment) supplier
Able to provide free/low-cost DME (walkers, shower chair, wheelchair, diabetic supplies, Boost, etc) to low-income patients. Some patients can also qualify for free/low-cost home modifications (like wheelchair ramp installation).

Transportation Resources

****Most Health Insurance Providers offer free medical Ubers to/from medical appointments. Advise patients to inquire with their Health Insurance supplier for additional information****

Access to Healthcare **844-469-4933**
Free transportation service to medical appointments
Participants must be either 60+, disabled, or qualify by income. In addition to medical appointments, patients can also be transported to the pharmacy, gym, or grocery store. Rides should be arranged 2-3 weeks in advance.

Washoe Senior Ride (WSR)
Taxi fare subsidization program
Provides affordable transportation to Washoe County residents who are 60 years and older, disabled or a Veteran (any age). Each month WSR participants may purchase up to $60 worth of taxi fares for just $15. Participants are issued a RTC WSR CardONE reloadable card, which can be used to pay any part of a taxi fare. Obtain a WSR at a Reno/Sparks RTC station

- RTC 4th Street Station, 200 E 4th Street, Reno.
  Hours: 8 AM to 11: 30 AM and 1 PM to 4 PM Monday-Friday
  Phone: 775-348-RIDE (7433)
- RTC Centennial Plaza, 1421 Victorian Avenue, Sparks.
  Hours: 8 AM to 11: 30 AM and 1 PM to 4 PM Monday-Friday
  Phone – 775-348-RIDE (7433)

Primary Care Clinics

All of the following community clinics offer (varying levels) of transportation to/from appointments and accept uninsured patients. All clinics offer primary care, psychiatry, therapy, case management, and women's health services.

WC Health (formerly Wellcare) 850 Mill Street
775-538-6700
*All patients get free medication delivery
**Some providers offer MAT services
PUF House 850 Mill Street or 155 West 2nd Street
775-624-8789 (M-F 0900-1730)
In addition to community clinics, WC Health operates the PUF (Psychiatric Urgent Facility) with a variety of walk-in services including:
-*Opportunity for same day psychiatric, primary care, therapy, and women's health services*
-Transitional housing (30-60 days) for qualified Anthem Medicaid patients
-Safe space with clothing, food, and water

Hopes Clinic 580 West 5th Street
775-786-4673
*Has a Medication Assisted Therapy and clean needle exchange program
**New patients must call at 0800 sharp for a first-time appointment
Walk-In Clinic 1905 E 4th St
775-786-4673
M-F 0800-1600 (closed for lunch from 1300-1400)
Available for all adults with acute, nonemergency complaints

Community Health Alliance (multiple locations)
775-329-6300
*Offers pediatric dental care
**Multiple locations in Reno/Sparks
330 Crampton Street, Reno NV 89502
3915 Neil Road, Reno NV 89502
5295 Sun Valley Blvd, Sun Valley NV 89433
280 Vista Knoll Pkwy, Ste 107, Reno NV 89506
2244 Oddie Blvd, Sparks, NV 89431
1055 S Wells Ave, Reno, NV 89502

REMSA Health **Crisis Care** Alternate Destination

VITAL SIGN PARAMETERS:

Mentation	*BP*	*Pulse Rate*	*SpO2*	*Blood Glucose*
A&O to Baseline	*SBP 90-180 DBP<110*	*<120 >50*	*≥ 93%*	*<300 or >60 w/o S/S of DKA*

ELIGIBILITY CRITERIA	• Meets ADT vital signs criteria • Meets "**Facility Specific Info**" (see below) • Able to care for self (ambulate without assistance, complete ADLs) • Experiencing a mental health crisis • **Legal Hold accepted at Renown Crisis Center ONLY** • Seeking substance abuse treatment • Other complaint with receiving facility acceptance
EXCLUSIONARY CRITERIA	• **Patients requiring more than 23hr stay are not eligible for Renown Crisis Center** • Violent patient (or patient requiring field sedation) • 3rd trimester pregnancy • Indwelling catheters • Need for supplemental O2 • Insulin pump • Recent trauma • Recent seizure activity • Naloxone administration • Intellectual disability
ASSESSMENT	All patients will have a complete and thorough assessment; including a complete set of vital signs, complaint based physical exam, and medical history.
PROCEDURE	• Contact ADT facility prior to transport for facility acceptance • **If patient is refused, complete "Facility Diversion" in ePCR and document diversion reason**

Crisis Destination Locations:

Destination	***Phone #***	***Hours***	***Facility Specific Info:***
Renown Crisis Care Center *480 Galletti Way Unit 25C*	*775-982-8870*	*24 hr/day*	• ***Must be over 18 years old*** • ***23hr stay MAX*** • *Accepts patients on Legal Holds* • Accepts all insurance
Reno Behavioral Health *6940 Sierra Center Pkwy*	*775-393-2200*	*24 hr/day*	• *Accepts minors **with** guardian* • *Capacity for in-patient admission* • *Does **NOT** accept Legal Holds*

Urgent Care DX Capabilities	**X-Ray, POC testing (Urinalysis, Covid/Flu swabs, pregnancy, Mono, RSV, strep, glucose), sutures, medication refills, fracture management (splinting, bracing, reductions, ortho glass), I&D, toe nail removal**

VITAL SIGN PARAMETERS:

Mentation	***BP***	***Pulse Rate***	***SpO2***	***Blood Glucose***
A&O to Baseline	*SBP 90-180 DBP<110*	*<120 >50*	*≥ 93%*	*<300 or >60 w/o S/S of DKA*

ELIGIBILITY CRITERIA	• Meets ADT vital signs criteria
	• >12 with legal guardian
	• Patient can care for self (ambulate without assistance, complete ADLs)
	• Patient presents with a **low-acuity** complaint with low-index of suspicion for inpatient admission including:
	  ○ Allergic Reactions (Minor) / Rashes
	  ○ Lower back pain (acute exacerbation or subacute)
	  ○ Lacerations (non-complicated, minor) / Abrasions / Wounds / Burns
	  ○ Cough / Sore Throat /Upper Respiratory Like Illness
	  ○ Eye/ear/nose/throat complaints
	  ○ Musculoskeletal Injury / Sprains & Strains
	  ○ Medication Refill (non-controlled substance)
	  ○ Rash or mild cellulitis
	  ○ Suspected Sexually Transmitted Infection / Dysuria
	  ○ Nausea, Vomiting and/or Diarrhea (<24 hours)
	  ○ Animal/insect bite
	  ○ Other complaint with receiving facility acceptance

EXCLUSIONARY CRITERIA	• Presents with a high-risk complaint (chest pain, SOB, ALOC, etc) • MVC>45 MPH • Pregnancy > 16 weeks • Need for imaging beyond X Ray capabilities • Severe pain • Unable to transfer with minimal assistance
ASSESSMENT	All patients will have a complete and thorough assessment; including a complete set of vital signs, complaint based physical exam, and medical history.
PROCEDURE	• Contact ADT facility prior to transport for facility acceptance • **If patient is refused, complete "Facility Diversion" in ePCR and document diversion reason**

Destination Locations: Renown Urgent Care

Facility	**Phone #**	***Hours of Operation***	***Insurance Accepted***
Ryland *975 Ryland St, Reno*	775-982-5000	*Daily 0800-2100*	*All major insurance and Medicaid* ***except*** *Prominence. Verify specific insurance upon calling for report.*
Damonte *197 Damonte Ranch Pkwy Ste A-B, Reno*	775-982-5000	M-F 0800-1900 Sat-Sun 0900-1700	
Vista *910 Vista Blvd, Sparks*	775-982-5000	M-F 0800-1900 Sat-Sun 0900-1700	
Los Altos *202 Los Altos Pkwy, Sparks*	775-982-5000	M-F 0800-2100 Sat-Sun 0900-1700	
North Hills *1075 N Hills Blvd Ste 180, Reno*	775-982-5000	M-F 0800-1900 Sat-Sun 0900-1700	
Summit Ridge *4791 Summit Ridge Dr, Reno*	775-982-5000	M-F 0800-1900 Sat-Sun 0900-1700	

Destination Locations: Saint Mary's Urgent Care

Facility	**Phone #**	***Hours of Operation***	***Insurance Accepted***
Northwest *6255 Sharlands Ave, Reno*	775-770-7582	*Daily 0800-1900*	*Call to inquire about insurance.*
North Valleys *280 Vista Knoll Pkwy #106, Reno*	775-770-7631	*Daily 0800-1900*	

REMSA Health Assess and Refer Protocol

The purpose of the Assess and Refer Protocol is to provide guidance for evaluation, assessment and referral for patients seeking care for low acuity complaints that do not require ambulance transport or clinician monitoring during transport. This protocol is not intended as a "refusal" to transport, rather, it should help EMS providers navigate low acuity patients to the right level of care.

VITAL SIGNS ELIGIBILITY PARAMETERS				
Blood Pressure	**Pulse rate**	**SpO_2**	**Blood Glucose**	**Mentation**
SBP 90-180 DBP < 110	< 120 > 50	≥ 93%	< 300 OR > 60 w/o S/S of DKA	Alert & Oriented to Baseline

ELIGIBILITY
Detailed clinical presentations below
	• Meets ADT vital signs criteria
	• >12 with legal guardian
	• Patient can care for self (ambulate without assistance, complete
	• ADLs)
	• Has capacity and free of impairment
	• Patient presents with a **low-acuity** complaint such as the following:
	  ○ Allergic Reactions (Minor) / Rashes
	  ○ Lacerations (non-complicated, minor) / Abrasions / Wounds/ Burns
	  ○ Cough / Sore Throat / Suspected URI, ILI or CLI
	  ○ Extremity Fractures (neurovascularly intact, closed) /Sprains & Strains
	  ○ Medical Refill
	  ○ Suspected Eye Infection
	  ○ Suspected Sexually Transmitted Infection / Dysuria
	  ○ Vomiting and/or Diarrhea (<24 hours)
	  ○ Other low acuity complaint with online medical patched & recorded through REMSA Health dispatch

ASSESSMENT	All patients will have a complete and thorough assessment; including a complete set of vital signs, complaint based physical exam, and medical history.
DISQUALIFICATION CRITERIA	• Adamantly requests transport to Emergency Department • Does not have the capacity understand condition and need to follow-up • Pregnant >16wks • Cannot safely access care by other means
DOCUMENTATION	• All patient contacts will be documented in Image Trend. • Completing the insurance section of the electronic patient care report is required to include a copy of the patient insurance and government issued identification. • Disposition will be "**ASSESS & REFER**". • 100% of Assess & Refer charts are reviewed by Clinical
MOBILITY / TRANSPORTATION	If the patient does not have access to safe transportation, a round-trip taxi shall be offered at REMSA Health's expense.

PRESCRIPTION MEDICATON REFILL		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Current prescription of medication requesting to be refilled	Without complaint of acute illness or injury	Acute illness or injury

QUALIFICATIONS FOR ASSESS AND REFER

- Has been evaluated by a licensed provider and has an existing prescription for medication requested
- Patient is solely requesting refill of their medication and is currently without an acute medical or traumatic complaint
- Is not requesting a refill of a benzodiazepine
- Is not requesting a refill of a scheduled narcotic
- Is not requesting a refill of a behavioral health / psychotropic medication (e.g., SSI, Antipsychotics, etc.)

SUSPECTED EYE INFECTION		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Ocular discomfort, typically unilateral	Pain Itching Redness Tearing Discharge	Conjunctivitis Traumatic injury Foreign body CVA Migraine Chemical exposure

QUALIFICATIONS FOR ASSESS AND REFER

- Suspected minor eye infection based on exam and history
- No change in baseline visual acuity

SUSPECTED SEXUALLY TRANSMITTED INFECTION / DYSURIA		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Genital or urinary discomfort	Dysuria Hematuria Itching Pain Rash Discharge Fever	Urosepsis Candidiasis Urinary tract infection Sexually transmitted infection

QUALIFICATIONS FOR ASSESS AND REFER

- Urosepsis is not suspected
- Not a result of a traumatic injury
- Urinary retention (inability to urinate) is not suspected based on history and exam

MINOR ALLERGIC REACTIONS		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Symptoms following exposure (e.g. food, medication, insect, etc.) Symptoms not rapidly worsening or progressing No history of anaphylaxis	Itching Redness Urticaria Rhinorrhea Rash	Anaphylaxis Seasonal allergies Unknown infectious process Contact dermatitis Chemical burn Idiopathic angioedema Evolving / impending anaphylaxis Envenomation

QUALIFICATIONS FOR ASSESS AND REFER

- Allergic reaction is minor, not involving or does not have the predicted potential to involve the patient's airway.
- Patient may receive oral or intramuscular antihistamines as clinically indicated and per protocol.
- Does not have difficulty breathing, speaking or swallowing.
- Does not present with the need for bronchodilator or oxygen therapy.

SORE THROAT / COUGH / FLU-LIKE SYMPTOMS		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Symptoms, history and physical exam consistent with an acute infectious process Confirmed ILI / CLI Communal exposure	Cough Rhinorrhea Nasal congestion Fever Headache Chills Body aches Sore throat Malaise	Pneumonia Bronchitis Pulmonary Emboli Seasonal allergies Pneumothorax Asthma COPD exacerbation Sepsis Influenza COVID-19

QUALIFICATIONS FOR ASSESS AND REFER

- Sepsis is not suspected.
- Patient does not meet criteria or the need for treatment under the sepsis protocol.
- Does not present with the need for bronchodilator or oxygen therapy.

LACERATIONS / MINOR WOUNDS & BURNS		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Low mechanism of injury Does not meet state trauma criteria Thermal burn	Abrasions Skin tears Superficial thermal burn Laceration	Infection Occult internal injuries Chemical burn Electrical burn

QUALIFICATIONS FOR ASSESS AND REFER

- Hemorrhage is controlled using basic wound care techniques
- No impaled or penetrating objects
- No chemical burns or need for decontamination
- Superficial thermal burns without airway or joint involvement
- No obvious need for intravenous antibiotics
- No full thickness burns
- No partial thickness burns > 15% of BSA

EXTREMITY INJURY / SPRAINS / STRAINS		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Recent traumatic injury Low mechanism of injury Does not meet state trauma criteria	Pain at site Swelling Distal CMS intact Deformity	Occult injury

QUALIFICATIONS FOR ASSESS AND REFER

- No indication of neurovascular compromise
- Pain managed with splinting, elevation, ice and /or OTC analgesics
- No compound fractures
- Hip / pelvic fracture is not suspected

VOMITING AND / OR DIARRHEA (<24 HOURS)		
HISTORY	**SIGNS & SYMPTOMS**	**DIFFERENTIALS**
Vomiting and / or Diarrhea	Vomiting Diarrhea Fever	Gastroenteritis Appendicitis Peptic ulcer Bowel obstruction Increased intracranial pressure CVA Cardiac emergency AMI

QUALIFICATIONS FOR ASSESS AND REFER

- Symptoms must be for less than 24 hours
- Denies abdominal pain or tenderness
- No presentation or recent history of GI bleed (vomit, stool)
- Without suspicion of a subtle cardiac or neurologic presentation (e.g., AMI, increased ICP). *High index of suspicion with diabetic patients
- Does not present with the need for intravenous fluids or IV antiemetics

Emergency Triage, Treat, and Transport/ADT

Arrive on Scene: Perform initial scene size up and begin assessment of the patient including a complete physical exam. For *non-emergent/low-acuity* patients, assess for ET3 and ADT eligibility.

ET3 Criteria	TeleHealth	ADT

• Chief complaint appropriate
• Age appropriate: ≥ 12 Y/O
• Determine patients' best treatment option:
  ○ Assess and Refer
  ○ TeleHealth
  ○ ADT
  ○ Hospital ER
	• Initiate TeleHealth visit on iPad -or- provider pushes link to Pt. device.
	• Provide complete report to physician.
	• Follow patient and physician treatment plan including potential transport.
		• Facility is open and can meet patient needs.
		• Pt is ambulatory and self-sufficient.
		• Pt can access or has reliable transport home.
		• Call ahead and confirm transport.

Does the patient have a high acuity complaint? To include but not limited to: Neurological changes, ALOC, chest pain, respiratory distress, severe pain, or change in ambulatory status in the last 24 hours?

YES → Transport to appropriate Emergency Center

NO ↓

Are the resting V/S outside of acceptable range?

HR: 50-110 **SBP**: 95-180mmHg **RR**: 10-22 **SPO2**: 94-100%

YES → Transport to appropriate Emergency Center

NO ↓

Does the patient have a complaint not easily assessed or examined?

Ex: Pelvic/Genital area, Rectal, or OBGYN

YES → Transport to appropriate Emergency Center

NO ↓

Is the patient capable of following the directions of the Telehealth MD? Including a ride to and from a pharmacy/medical appointment, or other foreseeable physical requirements to follow the presented treatment path?

NO → Transport to appropriate Emergency Center

YES ↓

Does patient consent to an Alternative Destination or Telehealth in place of Emergency Room Transport?

NO → Transport to appropriate Emergency Center

YES ↓

Initiate Virtual Visit OR Transport to an approved Alternative Destination

REMEMBER TO ACQUIRE PATIENT PHONE NUMBER FOR NHL FOLLOW UP

ET3 Appropriate Patient Examples:

- **Motor Vehicle Crash** – low speed, belted, ambulatory at the scene, no complaint or "wants to be checked out" or minor musculoskeletal complaint. Think parking-lot fender bender or rear-ended at a stoplight. NOT crashes on roads with speed limit 45 or greater.
- **Flu-like illness or "common cold"** - One or minor upper respiratory complaints, +/- fever with or without malaise, aches, chills, minor respiratory symptoms. Patients must NOT meet sepsis screen per our usual sepsis protocol.
- **Cough** – with or without MILD shortness of breath. No hypoxia, no respiratory distress. May be "common cold", bronchitis, sinus infection, "walking pneumonia", etc.
- **Eye, ear, nose, throat complaints** - (e.g., conjunctivitis, ear pain, minor epistaxis not on blood thinners, sore mouth/throat)
- **Nausea, Vomiting, Diarrhea** – WITHOUT severe abdominal pain or tenderness (minor cramping ok). N/V/D must be limited to 1-2 days, patient must be able to ambulate, not orthostatic. Patients must be likely to tolerate PO intake.
- **Mild dehydration**
- **Animal bite or insect bite**- If animal, cat, or dog bite only, with minor injury that may/may not need stitches (no involvement of joint, tendon). Transport to ED, if possible, is needed for rabies prophylaxis (unknown animal) or patient bitten while in LE custody.
- **Musculoskeletal injuries** – Including minor lacerations and deformities that may or not need X-rays or stitches. Patients should be able to bear weight with the extremity and use the extremity. Any bleeding must be controlled (no tourniquet).
- **Minor burns** – e.g., sunburn or first/second degree burns with minimal BSA involvement, no face, no circumferential burns, no fingers, toes, or genitalia.
- **Minor ground level falls** – No change in ambulatory status, No syncope, No LOC, No intoxication, No obvious significant injury. Cervical spine can be clinically cleared.
- **Low back pain** – acute exacerbation or subacute. Patient is ambulatory, no extremity weakness, no difficulty with bowel or bladder function. Chronic back pain is not appropriate for urgent care environment.
- **Allergic reaction** – In the "mild" category per usual EMS protocol, i.e., no epi before arrival and no epi from responders.
- **Rash or mild cellulitis** – On extremity & without fever (e.g., poison ivy, shingles, "diaper" rash)

KETOROLAC (TORADOL)

Classification – Nonsteroidal Anti-Inflammatory (NSAID)

Pharmacology and Mechanism of Action – KETOROLAC works by reducing hormones that cause inflammation and pain in the body. KETOROLAC is non-narcotic and is not habit-forming. It is 30 times the strength of aspirin. It will not cause physical or mental dependence, as narcotics can. However, KETOROLAC is sometimes used together with a narcotic to provide better pain relief than either medicine used alone.

Indications – Moderate to severe pain secondary to kidney stones, back pain or pain associated with isolated trauma.

Contraindications –
Do not administer KETOROLAC if the patient has:

- An allergy to aspirin (ASA) or NSAIDs
- Severe renal disease or a kidney transplant
- A bleeding or clotting disorder
- Multi-system trauma
- Injury to the head
- Suspected or the possibility of developing internal bleeding
- Stomach ulcer or history of gastrointestinal bleeding
- Is a possible surgical candidate for presenting injury or illness

Special Considerations – Consider contacting online Medical Control if the patient has a history of liver disease, chronic alcohol abuse, or history of asthma as KETOROLAC can worsen these conditions.

Side Effects – Nausea, vomiting, gastric distress, dizziness, dry mouth, abnormal taste in mouth, blurred vision and drowsiness.

Purpose

The purpose of the Nitrous Oxide protocol is to provide a safe and effective amount of analgesia for the patient's illness or injury by the Advanced-EMT or Paramedic. Based on the REMSA clinician's assessment of the patient, their past medical history, clinical findings, and risk factors, the patient may be administered Nitrous Oxide and transported for the conditions outlined in this protocol.

INDICATIONS
• Isolated Extremity Trauma • Single Extremity Burns without other associated injuries • Uncomplicated Back Pain • Dental Pain • Ear Pain

CONTRAINDICATIONS
• Hemodynamically Unstable • COPD • Dyspnea • Chest Pain • Chest Trauma • Abdominal Pain • Alcohol Intoxication • Pregnant • Altered Level of Consciousness • Incapable of comprehending instructions or holding the mouthpiece without assistance

PROCEDURE
• Request ALS Backup • Instruct the patient to administer NITROUS OXIDE to themselves by holding the mouthpiece and breathing deeply and slowly • Allow the mouthpiece to fall away from the patient spontaneously when the effects are felt • The mouthpiece must be held by the patient; it is not to be held by anyone else • Document amount administered in minutes and effect

ASSESS AND DOCUMENT
• Complete set of V/S before and after administration • Time of onset • Mechanism of injury or suspected illness • Provocation • Quality and/or radiation of the pain • Pain scale before and after administration

Regional Emergency Medical Services Authority

450 Edison Way, Reno, Nevada 89502

775.858.5700

PROCEDURE MANUAL

Indications:
Can be used with patients with an absent gag reflex with a suspected neck injury, patients positioned without adequate access behind their head for normal techniques, or as a second line technique when conventional visualization is unsuccessful.

Procedure:

- Insert a bite stick, OPA, or similar device between the patient's teeth to prevent the patient from biting down on your fingers.
- "Walk" the middle and index finger of one hand down the patient's tongue until the epiglottis is felt.
- Lift the epiglottis and tongue anteriorly.
- Insert the ET tube using your middle and index fingers into the trachea.
- You can also use the ET Tube Introducer in the same manner and then insert the ET tube over the introducer.
- Once the tube is in place, use the same procedures to secure and confirm tube placement as with any other intubation.

Assessment and Care:

- Obtain quantitative ETCO2 to confirm tube placement within 15 seconds of placement. Tube placement must be checked with every patient move per airway protocol.
- A cervical collar can help prevent tube dislodgement.
- Use of the portable ventilator is strongly encouraged as it will provide a consistent rate and volume of respiration. Begin at a rate of 10/min and increase only if the patient clearly needs an increased rate to improve oxygenation.
- Each attempt at intubation should be limited to 30 seconds with BVM ventilations between each attempt.

Indications:

To establish intravenous access in critically ill or injured patients after attempts at intravenous cannulation in the upper extremities have failed or the vasculature at the extremity sites are deemed too poor too successfully cannulate (i.e., severe shock or cardiopulmonary arrest).

- This procedure is not to be used for routine IV access.

Contraindication:

- Inability to visualize the vein due to obesity or other conditions.
- If suspect C-spine injury, assistant must hold head in straight alignment when c-collar is removed to access external jugular vein.
- Previous EJ IV attempt on that vein in the past 48 hours.

Equipment:

- IV catheter (20 G IV or Greater)
- 10 ml NS Flush
- IV Catheter Extension tubing (IV Lock)
- Tegaderm
- IV Tape
- Antiseptic wipe or Alcohol Prep

Procedure:

1. Place the patient in a supine position, preferably head down, to distend the vein and help prevent air embolism.
2. If c-spine injury is not suspected, turn the patient's head to the opposite side of site.
3. Clean the site with chlorhexidine/alcohol.
4. Press on the vein just above the clavicle with your forefinger to make the vein more prominent. Stabilize the skin over the vein with your thumb.
    a. If you are having trouble visualizing the external jugular, you may apply pressure on the liver (portal pressure) to engorge the external jugular.
5. Maintaining slight positive pressure on the syringe, insert IV catheter into vein. Once blood freely flows into the syringe, cannulate the vein in the normal fashion.
6. Maintain compression on the vein with the forefinger until IV tubing has been connected to the catheter.
7. Secure the catheter and tubing in place with Tegaderm and IV Tape.
8. ****You may attempt this procedure only once on each side. ****

Assessment and Care:

- There is a potential for pneumothorax.
- Check breath sounds, oxygen saturation, and work of breathing/compliance frequently.
- If the IV catheter penetrates the opposite side of the vein (blows), apply direct pressure for two minutes and check site frequently for expanding hematoma.

Therapeutic Objective: *To maximize oxygenation and ventilation in the compromised patient and limit the potential for aspiration.*

- The patient should be pre oxygenated with passive oxygen via nasal cannula at 15 LPM, with BLS airway adjunct and assisted ventilation via BVM.
- The supraglottic airway is considered an equivalent alternative to endotracheal intubation.
- If the advanced airway is placed in a patient who may have a return of gag reflex, it is strongly recommended to consider sedation and analgesia immediately after successful placement of that airway.

BLS before ALS:

- Always Consider a BLS airway prior to escalation of an advanced airway. In order of acuity, this should include:
    - Nasal Cannula: 2-6 LPM of Oxygen *(15-25 LPM acceptable when intubating)*
    - Simple Mask: 6-10 LPM of Oxygen *(remove the NRB mask nitrile valves to turn it into a simple mask)*
    - Non-Rebreather Mask: 10-15 LPM Oxygen *(giving under 10LPM O2 may cause the patient to "rebreathe" their own CO2)*
    - Bag Valve Mask (BVM) Ventilation: 10-25 LPM Oxygen
    - Use PEEP to increase oxygenation and target SpO2 93-95%
- When a successful BLS adjunct is present and oxygenation is adequate, it may be beneficial to reach a *higher level of care* rather than delaying transport in order to place an advanced airway on scene.
    - Consider:
        - Indications and contraindications
        - Distance to ER or intercepting unit
        - Available resources on scene
        - The MOI and NOI of the patient

Indication to Escalate Care:

- Any clinical situation in which a definitive airway is necessary such as, but not limited to:
    - Airway or ventilation compromise
    - Burns
    - Shock states

Contraindications:

- There are no absolute contraindications; however, the clinician should exercise caution when encountering the following situations.
    - Suspected transection, or tear of the trachea
    - Potential unstable cervical spine injury
    - Suspected epiglottitis or laryngeal edema

Equipment Preparation:

- Confirm that the following equipment and assessment tools are attached, functioning, ready, and within arm's reach.
    - Pt connected to SpO2, Automated BP Cuff with baseline reading, ETCO2 is calibrated and reading for "In-Line" monitoring, and 4 Lead ECG lead are on.
    - Bag-valve mask connected to oxygen source with oxygen flowing to bag.
    - Suction ON with attached tubing and rigid catheter at pt head.
    - Appropriately sized endotracheal tubes are set to the right of the pt's head.
    - Bougie (also known as Endotracheal Tube introducer - ETTI)
    - Appropriate size syringe for inflating ETT cuff per manufacturer recommendation along with a syringe sized for back up LMA cuff inflation.
    - ETT securing device.
    - Alternate Airways:
        - Supraglottic and surgical devices and equipment out and readily available for immediate use
- Confirm the following equipment is functioning properly:
    - Laryngoscope handle and blade have no loose parts and are functioning properly, including light sources.
    - Assure extra blade shapes and sizes are readily available.
    - Confirm that there are no leaks in ETT cuff, tubing, or pilot balloon, and consider lubricating distal tip and cuff of the ETT to facilitate passage.

Equipment Pearls
Pediatric ETT Size Estimate: (age+16)/4
OB Patients: Utilize appropriate ET tube size -0.5mm

Patient Positioning:

- Optimal patient positioning is with the head extended on the neck and the neck slightly flexed relative to the torso. A small towel under the occiput (to raise it 7-10 cm) may facilitate positioning in adult.
    - Guideline – The external auditory canal opening should be roughly at the same level as the sternal notch.
- **If the pt has c-spine immobilization in place** open the front of the collar and maintain manual cervical spinal immobilization in a neutral position.
- **Sellick's Maneuver** or "cric pressure" may be applied if RSI or DFI medications are administered or the pt requires bag valve mask ventilation.
- **Pediatric Patients** may require a folded blanket or towel under the upper torso due to the increased size of occiput relative to body.
- **Morbidly obese patients,** or patients with large body habitus may require extensive padding under the shoulders and head to maintain optimal positioning. Gurney "ramping" or elevating the head of the gurney or backboard slightly may increase ease of intubation.

Patient Preparation

- Assure that oxygen has been applied to the patient, and SpO2 is equal to or above 93 percent.
    - This can be accomplished with either:
        - A non-rebreather flowing at 15 - 25 LPM.
          -or-
        - BVM ventilations while attached to an oxygen source.
          -or-
        - Nasal cannula placed and flowing at 15 lpm.
- Remember to "Resuscitate before intubate" and assure that the Advanced airway procedure does not precipitate further clinical decline of the patient.

Assessing the Difficult Airway:

- Utilize the LEMONS or HEAVEN acronym to evaluate the potential for a difficult airway/ BVM ventilation. The clinician should assure that preparation is made to always address the unanticipated difficult airway, as well as ability to mechanically ventilate the patient via BVM if necessary.
- If the patient presents with a potentially difficult airway, the clinician should consider supraglottic airway placement as a primary means to secure the airway, as well as seek additional assistance, and recommendations from other scene providers.

Look	Externally examine pt for facial trauma, large incisors, beard, short neck, and large tongue
Evaluate the 3-3-2 rule	-3 fingers fit between upper/ lower incisors -3 fingers fit between the hyoid and the mentum -2 fingers fit between the mandible and the top of the thyroid cartilage
Mallampati score	Attempt assessment if pt is able to open their mouth
Obstruction	Is there any potential for obstructing the airway/ airway obstruction
Neck mobility	Okay?
Saturation	Does the patient have adequate reserve and how long before the patient desaturates

Hypoxemia	-DL faster if straightforward -VL may be faster with anatomic difficulty
Extremes of Size	-Extremely large patient: VL (out to in) and DL (in to out) if not recognized -Extremely small patient: DL with straight blade
Anatomic disruption/ obstruction	- VL (out to in) and DL (in to out) if not recognized -DL if bloody
Vomit/ blood/ fluid	DL with strong lift
Exsanguination	DL faster, VL with anatomic difficulty
Neck mobility/ neurologic injury	Gentler VL

Laryngoscopy Procedure:

- The clinician should be at the patient's head with an assistant on the right side. Optimally, the patient's head should be at the level of the clinician's lower sternum.
    - The laryngoscope should be placed in the clinicians left hand with the elbow slightly tucked relatively close to the provider to provide additional support.
    - The laryngoscope should be inserted in the right side of the mouth and tongue, gradually displacing the tongue to the left as the blade moves midline.
    - If the blade is inserted midline, the tongue will fold over the lateral edge of the blade, obscuring the clinicians view.
    - As the blade tip approaches the base of the tongue, the clinician should exert force along the axis of the laryngoscope handle, lifting upward and forward at a 45-degree angle.
    - Bending at the wrist should be avoided because it can result in dental injury as the teeth become a fulcrum for the blade.

Laryngoscopy Pearls
If the pt requires c-spine immobilization, additional assistance will be required to maintain head and neck in neutral position
It may help clinician to have an assistant laterally retract the patient's cheek to expose laryngeal structures during visualization
If the patient is in high fowlers due to severe dyspnea, the clinician may elect to perform intubation in high flowers using a step stool or lowered gurney (the patients head should be roughly at the height of the providers lower sternum)

- **Straight Blade:** The tip is inserted under and slightly beyond the epiglottis, directly lifting this structure with the jaw and larynx suspended by the blade.
    - If the blade is placed too deeply the entire larynx may be elevated anteriorly and out of the field of vision.
    - If the blade is deep and posterior there may be a lack of recognizable structures in the esophageal passage.
    - Gradual withdrawal of the blade should allow the laryngeal inlet to drop into view.
- **Curved Blade:** The tip is placed into the vallecula. Anterior elevation of the base of the tongue and epiglottis will expose the vocal cords.
    - If the blade is inserted too deeply into the vallecula, the epiglottis may be pushed down obscuring the glottis.

Bougie (ETTI):

Indications:

- An assistive device utilized during the process of any routine endotracheal intubation, *in which a size 6.0 tube or greater is being used*.
- May be helpful when a difficult airway is anticipated.

Contraindications:

- Do not use adult bougie on endotracheal tube smaller than 6.0.

Procedure:

- Hold bougie in the right hand with the angle of the tip pointed upward toward the anterior aspect of the patient.
- Advance the bougie anteriorly under the epiglottis or over the posterior notch into the glottic opening (cords).
- Gently advance the device until resistance is encountered at the carina.
  - *(If no resistance is noted and the entire length of the bougie is inserted, the device is most likely in the esophagus).*
  - The bougie is correctly placed when:
    - You see the device pass the Vocal Cords
    - You feel the washboard effect of the bougie on the tip of the trachea
    - Or you meet resistance of the bougie at the carina.
- Once the bougie position is confirmed, withdraw the bougie until the black line mark is aligned with the lip.
  - Assure the angled end of the bougie remains well past the cords to facilitate intubation.
- While holding bougie in place, have your partner or another provider on scene, thread the lubricated ET tube over the bougie into the trachea.
  - Maintain visual confirmation of the tube passing the cords.
  - Suction may be required as indicated.
- If resistance is encountered and suspected to originate from the ET tube catching the arytenoids or the aryepiglottic folds, withdraw the ET tube slightly and rotate the ET tube 90 degrees for reattempt at intubation.
- If reattempt is still unsuccessful, swap for a smaller tube leaving bougie in place.

Utilizing ELM (External Laryngeal Manipulation):

- The clinician performing the intubation will utilize the laryngoscope in the standard fashion and place their right hand on the patient's thyroid cartilage.
    - Utilizing gentle pressure, the clinician will determine the best position of the larynx from their perspective until optimal visualization of the vocal cords is achieved.
- The secondary provider will then take over ELM for the clinician with their own hand, maintaining laryngeal pressure in the same position as the clinician.
- The acronym **BURP** may be helpful when performing ELM.

Backward, **U**pward, **R**ightward, **P**ressure

Missed Attempts:

- Defined as placement of the laryngoscope into the patient's mouth with the INTENT to intubate.
- It is recognized that some patients will require multiple attempts at intubation.
- It is recommended that no more than two total attempts by a medical team will be made before moving to an alternate airway.
- Changes in intubation procedure such as blade size, blade type, additional suctioning as indicated, ETT size, or patient positioning will be performed after every unsuccessful intubation attempt as indicated.
- Clinicians shall make every effort to support the patient's breathing and oxygenation between attempts.
    - Oxygenation in an optimal situation will return to above 93% or as close to patients baseline as practical before another intubation attempt is made.

Endotracheal Tube Placement

- Placement of the ETT will be accomplished utilizing a bougie where practical (see 9. Bougie for guidance on use).
- Upon successful passage of ETT between the vocal cords, the clinician will inflate the balloon of the ETT with the minimal amount of air necessary to prevent air leak with positive pressure ventilation.
- Once ETT is successfully placed between the cords, the clinician will position the patient and secure equipment including ETT so that any cervical movement will not cause inadvertent extubating, displacement, or advancement of the tube into the right mainstem bronchus.

Tube Placement Pearls
Children: Tracheal Tube depth (cm) = age in years plus 10
Adults: Approximate Tracheal Tube Depth Women= 21 cm Approximate Tracheal Tube Depth Men: = 23 cm
Adults approximate tube depth calculation: Tube size utilized x 3

Advanced Airway Confirmation:

- **An Advanced Airway will be confirmed using the following methods:**
  - ETCo2 monitoring
    - This is mandatory for all patients post intubation or upon initial assessment of a patient with an advanced airway already in place.
  - Auscultate epigastric sounds first (should be negative).
  - Auscultate for bilateral breath sounds in all lung fields, peripheral and apical.
  - Baseline breath sounds should be prior to intubation procedure in trauma patients when practical to prevent inadvertent ETT displacement secondary to decreased lung sounds (these patients may have decreased, diminished, or absent breath sounds secondary to lung injury).

Securing the ETT

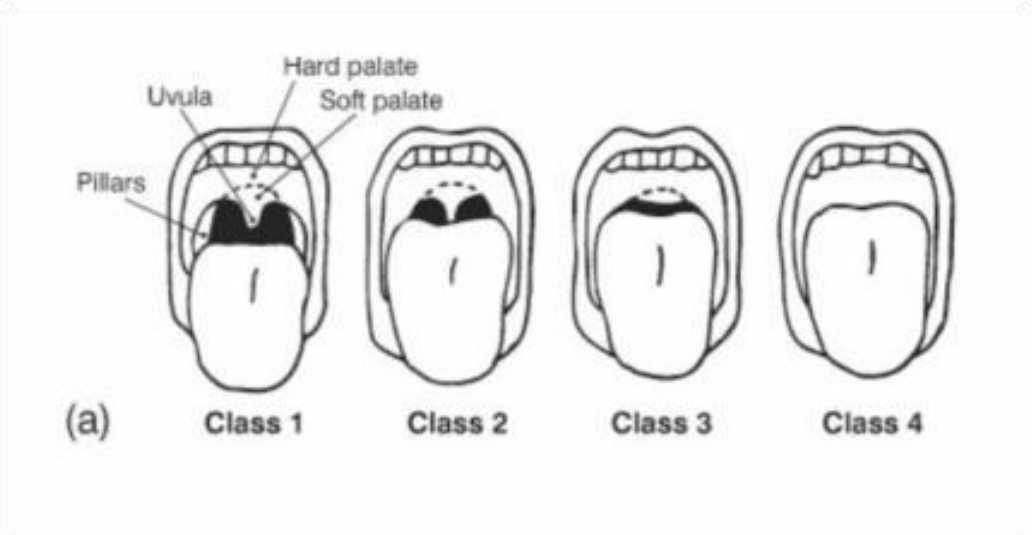
  - When possible, the ETT will be secured using a commercial securing device.
    - Other material for securing the ET tube may include any available tape, cling wrap, oxygen tubing… etc.

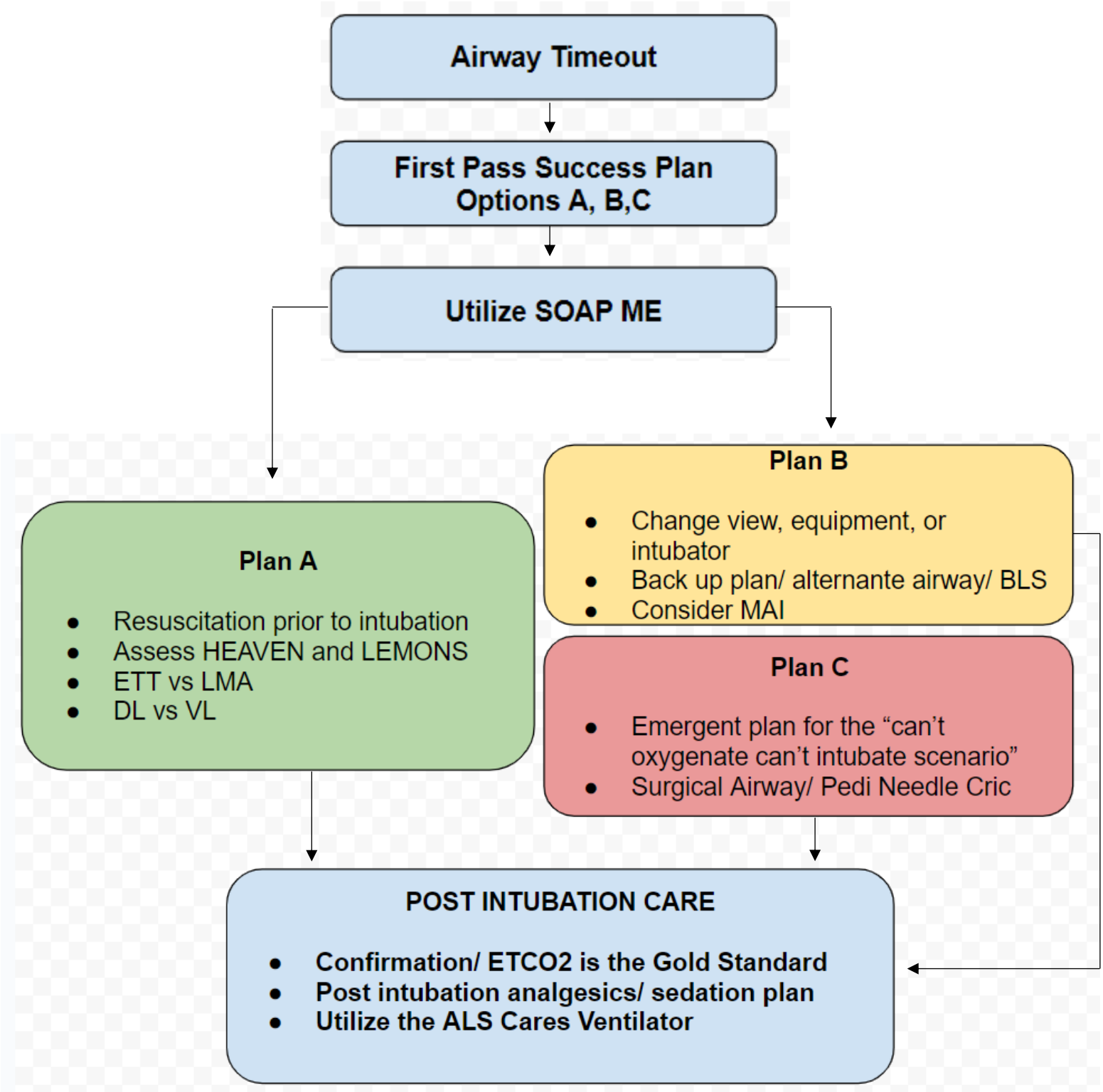
Ventilation

- Once the ETT is secured, the patient will be ventilated according to protocol and clinical standards.
  - Utilize mechanical ventilation with appropriate PEEP when available.
  - Consider use of the CARES Ventilator (Avocado Vent).
    - Use best practice to guide ventilation and oxygenation based on IBW (Ideal Body Weight), Past Medical History, SpO2, and ETCO2.
  - Avoid barotrauma and breath stacking when applicable.
- In Pediatrics use the T-Piece Resuscitator when available.

Documentation

- **Documentation of intubation procedure should include:**
  - Indications for intubation.
  - Blade size and type used.
  - ETT size used and depth of tube.
  - SpO2 reading immediately prior to intubation and the providers attempts at maintaining/correcting it.
  - Lowest observed pulse oximetry at any time prior to intubation.
  - Lowest pulse oximeter reading during intubation procedure.
  - Number of intubation attempts total by all responders on scene
    - *If there are multiple intubation attempts made, patient oxygen saturation and pulse during and between these attempts must be documented in addition to use of BVM ventilation, and changes the clinician made to facilitate successful intubation.*
  - Use of ELM or any other troubleshooting techniques
  - Use of ETT introducer (bougie)
  - Grade of view of the glottic opening during visualization (see image below)




Airway Timeout
First Pass Success Plan
Options A, B,C
Utilize SOAP ME
Plan A
Resuscitation prior to intubation
Assess HEAVEN and LEMONS
ETT vs LMA
DL vs VL
Plan B
Change view, equipment, or intubator
Back up plan/ alternante airway/ BLS
Consider MAI
Plan C
Emergent plan for the "can't oxygenate can't intubate scenario"
Surgical Airway/ Pedi Needle Cric
POST INTUBATION CARE
Confirmation/ ETCO2 is the Gold Standard
Post intubation analgesics/ sedation plan
Utilize the ALS Cares Ventilator

Indications:

- Immediate need for medication administration in a clinical setting when an IV is not possible, not practical, or otherwise unable to be established in a timely manner.
- In the clinical setting where a needle may cause increased discomfort or fear in a patient and may impede further care of the patient (I.e., Pediatrics or mentally impaired patients).
- Provider discretion on route of medication administration based on anatomy, demographics, or clinical presentation of a patient.

Contraindications:

- Nasal trauma or anatomical abnormalities of the Nose or Nasal Passages that may inhibit the administration or absorption of atomized medication into the Nasal Mucosal Membranes.
- High Volume medication of incorrect concentration.
    - Volume over 1ml per nostril may cause runoff.
- Certain medications are contraindicated for Intranasal administration in the protocol's Formulary.

Procedure:

1. Draw up the solution into an appropriately sized syringe.
    a. Be aware of the volume so that you do not administer over 1ml per nostril.
2. Expel the air from the syringe.
3. Attach the MAD via Luer Lock on the tip of the syringe.
4. Anticipate delivering half of the total desired dose into each nostril.
    a. This will double the surface area of medication administration between the two nostrils.
5. Place the MAD foam cone snugly into the patient's nostril.
6. Briskly compress the syringe plunger in one fluid fast motion to create an atomized mist.
    a. Gently pushing the medication such as in an IV will not allow for medication to atomize.
7. You may have the patient "pinch" their nose closed and keep their head tilted back for a 10 count to reduce drip and medication loss.

INDICATIONS:

EZ-IO AD® (40 kg and over) EZ IO® Bariatric (45mm) & EZ-IO PD® (3 – 39 kg)

1. Immediate vascular access in emergencies.
2. Intravenous fluids or medications are urgently needed and a peripheral IV cannot be established in (2) attempts or 90 seconds.
   -AND- the patient exhibits one or more of the following:
   a. An altered mental status (GCS of 8 or less)
   b. Respiratory compromise (SaO2 90% after appropriate oxygen therapy, respiratory rate < 10 or > 40 min)
   c. Hemodynamic instability (Systolic BP of < 90).

3. EZ-IO AD®, EZ IO® Bariatric & EZ-IO PD® should be considered PRIOR to peripheral IV attempts in the following situations:

   a. Cardiac arrest (medical or traumatic)
   b. Profound hypovolemia with alteration of mental status
   c. Patient in extremis with immediate need for delivery of medications and or fluids.

CONTRAINDICATIONS:

- Fracture of the bone.
- Excessive tissue at insertion site with the absence of anatomical landmarks.
- Previous significant orthopedic procedures
  - Previous IO within 24 hours, prosthesis, or joint/bone replacement.
- Infection at the site selected for insertion.
- **IF ANY CONTRAINDICATIONS ARE PRESENT CONSIDER AN ALTERNATE SITE.**

CONSIDERATIONS:

Flow rate: Due to the anatomy of the IO space, flow rates may appear to be slower than those achieved with an IV catheter.

- Ensure the administration of an appropriate rapid 10 ml NS flush through the IO prior to med administration,
  NO FLUSH = NO FLOW
- To ensure proper flow, consider the use of a pressure bag or infusion pump.

Pain:

Insertion of the EZ-IO AD® & EZ-IO PD® in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a large bore IV). However, IO Infusion for conscious patients has been noted to cause severe discomfort. If pain is encountered with flush or infusion of the IO; First ensure that the patient has no allergies or sensitivity to Lidocaine, then SLOWLY administer Lidocaine 2% (Preservative Free) through the EZ-IO hub.

- EZ-IO AD® Slowly administer 20 – 40 mg Lidocaine 2% (Preservative Free)
- EZ-IO PD® Slowly administer 0.5 mg /kg Lidocaine 2% (Preservative Free)

EQUIPMENT:

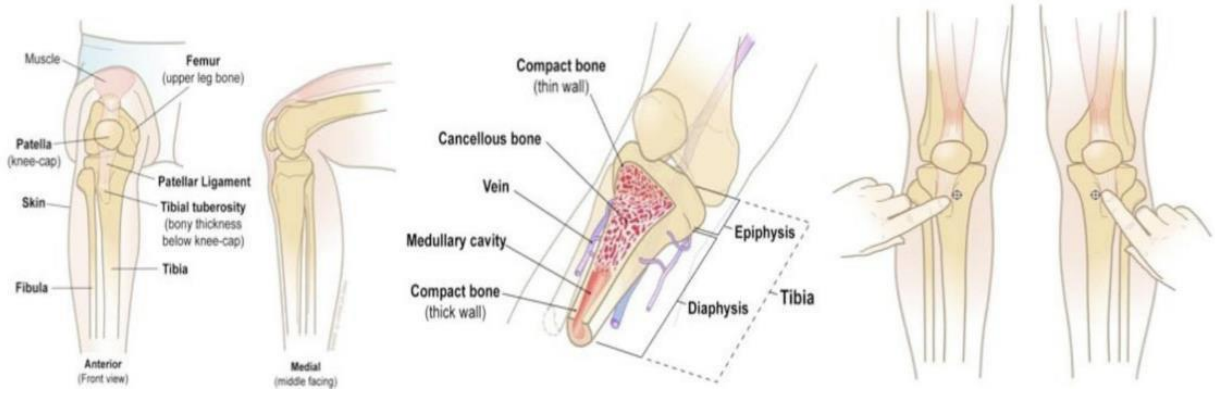
- EZ-IO® Driver
- EZ-IO AD®, EZ-IO® Bariatric or EZ-IO PD® Needle Set □ Alcohol or Betadine Swab
- EZ-Connect® or Standard Extension Set
- 10 ml Syringe
- Normal Saline (or suitable sterile fluid)
- Pressure Bag or Infusion Pump
- EZ-IO® Yellow wristband

PROCEDURE: *If the patient is conscious, advise of EMERGENT NEED for this procedure*

1) Wear approved Body Substance Isolation Equipment (BSI)
2) Determine EZ-IO AD®, EZ IO® Bariatric or EZ-IO PD® Indications.
3) Rule out Contraindications.
4) Locate appropriate insertion site.
    a. Proximal Tibia site for Adult, Adult Bariatric, and Pediatric patients.
    b. Proximal Humeral site for Adult and Adult Bariatric patients only.
        i. See specific Humeral IO Site technique below.
5) Prepare insertion site using aseptic technique.
6) Prepare the EZ-IO® driver and appropriate needle set.
7) Stabilize site and insert appropriate needle set (Ensure 5mm mark is visible)
8) While stabilizing catheter hub, remove EZ-IO® driver from needle set.
9) Remove stylet from catheter, place stylet in shuttle or approved sharps container.
10) Connect primed EZ-Connect®
11) Confirm placement by drawing out until marrow return is confirmed.
12) Rapidly flush 10ml NS through the EZ-IO® catheter (5 ml NS in pediatrics).
13) Utilize pressure (syringe bolus, pressure bag or infusion pump) for continuous infusions where applicable.
14) Dress site and secure tubing.
15) Monitor EZ-IO® site and patient condition – Remove catheter within 24 hours.

Proximal Tibial Site: Adult

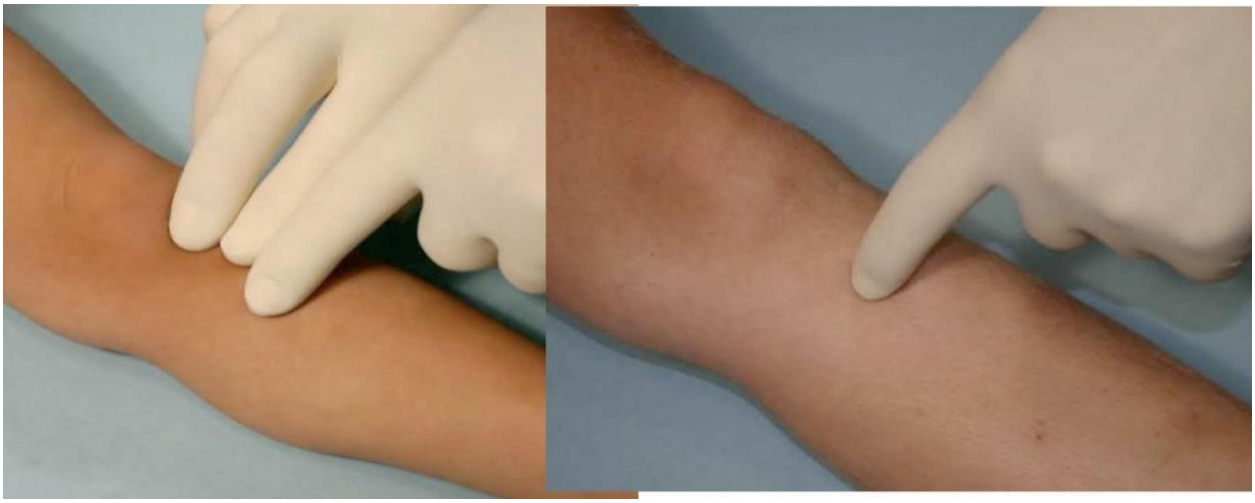
Proximal Tibial Anatomy: Adult Finding the Proximal Tibial Site: Adult



*Note that the insertion site is one finger width medial to the tibial tuberosity. *

Proximal Tibial Site: Pediatric (3-33kg)

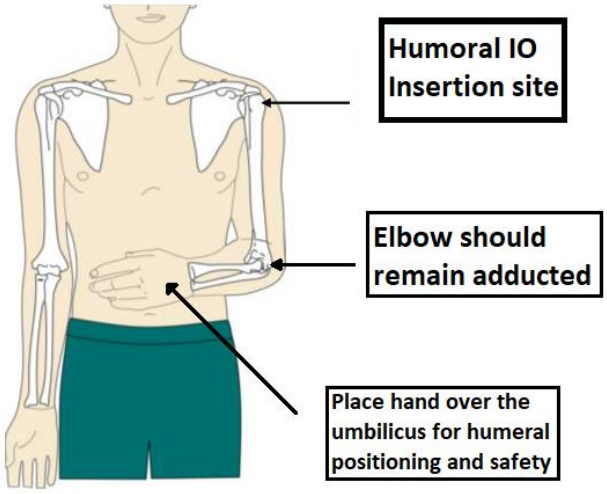
Pediatric Finding the Proximal Tibial Site:



- If the Tibial Tuberosity **CANNOT** be palpated, the Insertion site is two finger widths below the Patella (and then) medial along the flat aspect of the Tibia.
- If the Tibial Tuberosity **CAN** be palpated the Insertion site is one finger width below the Tuberosity (and then) medial along the flat aspect of the Tibia.

Proximal Humeral Site: Adult Only

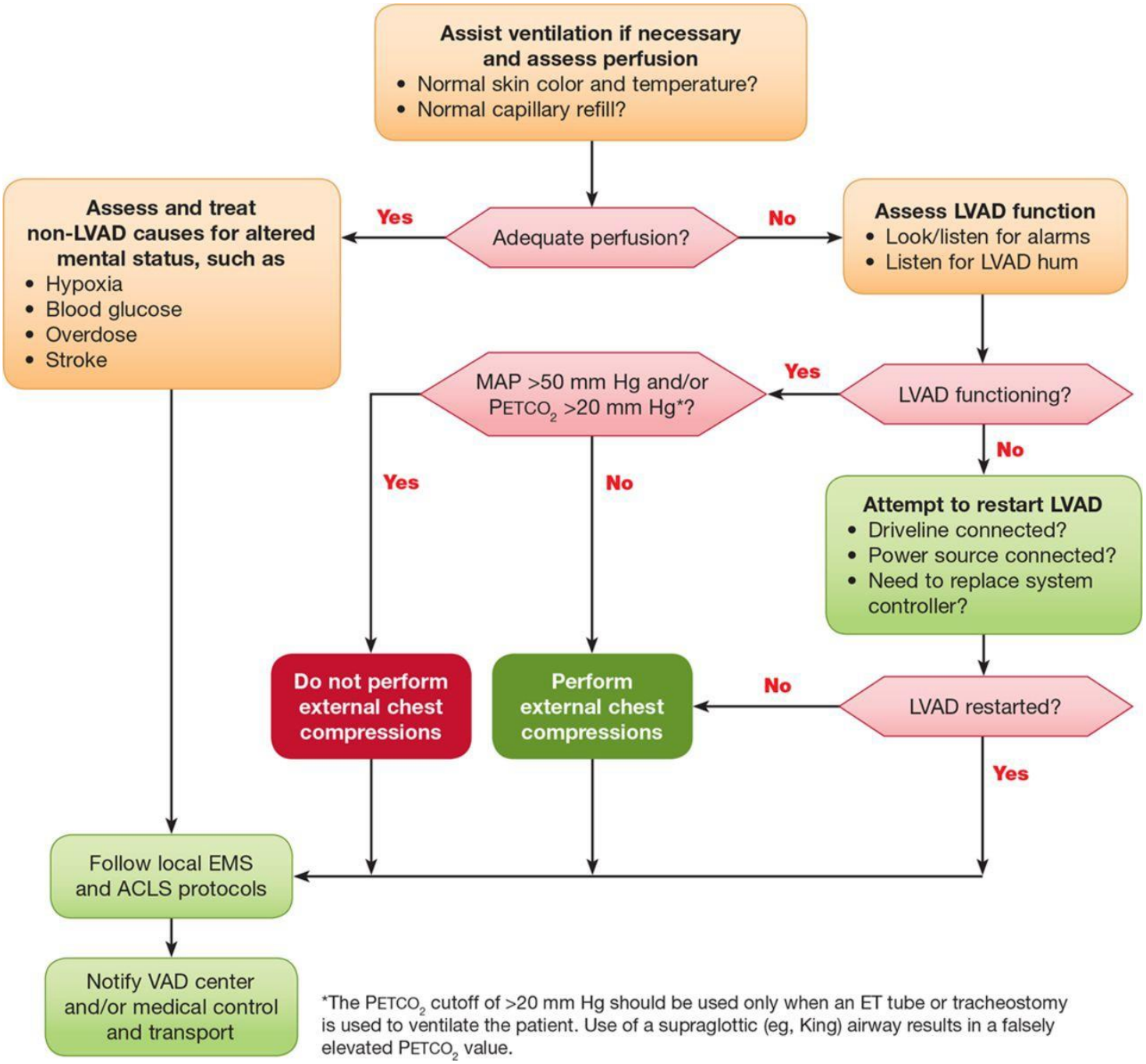
- To avoid injury to the biceps tendon during humeral IO insertion, position the arm in one of three ways:
    - Flex elbow, adduct arm (bring close to the body), and place patient's palm over the umbilicus. The arm can be placed in a sling for greater immobilization, if needed.
    - Extend elbow, adduct (bring close to the body), and hyper pronate the arm (palm down).
    - Flex elbow, adduct arm (bring close to the body), and place arm behind the patient's back while the patient is supine. This technique may be especially useful during CPR.



- Once you have appropriately placed the patient's arm, palpate the greater tubercle of the proximal humerus.
- Then locate the surgical neck of the humerus below the tubercle. The ideal insertion site is 1 cm above the surgical neck.
- Aim the IO at a 45 ° angle towards the contralateral hip.
- Using Aseptic Technique insert the needle through the skin and soft tissues until you hit the bone.
    - Check to make sure that you have at least 5 mm of catheter still outside of the skin, to ensure that your catheter will be able to fully sink into the marrow.
- Pull the trigger and drill the IO into place.
- Flush with a minimum of 5ml Normal Saline through the provided IO Lock.
- Secure the IO with a commercial device or roller gauze.

Note: Avoid excessive abduction of the arm over the head to prevent accidental IO dislodgement.

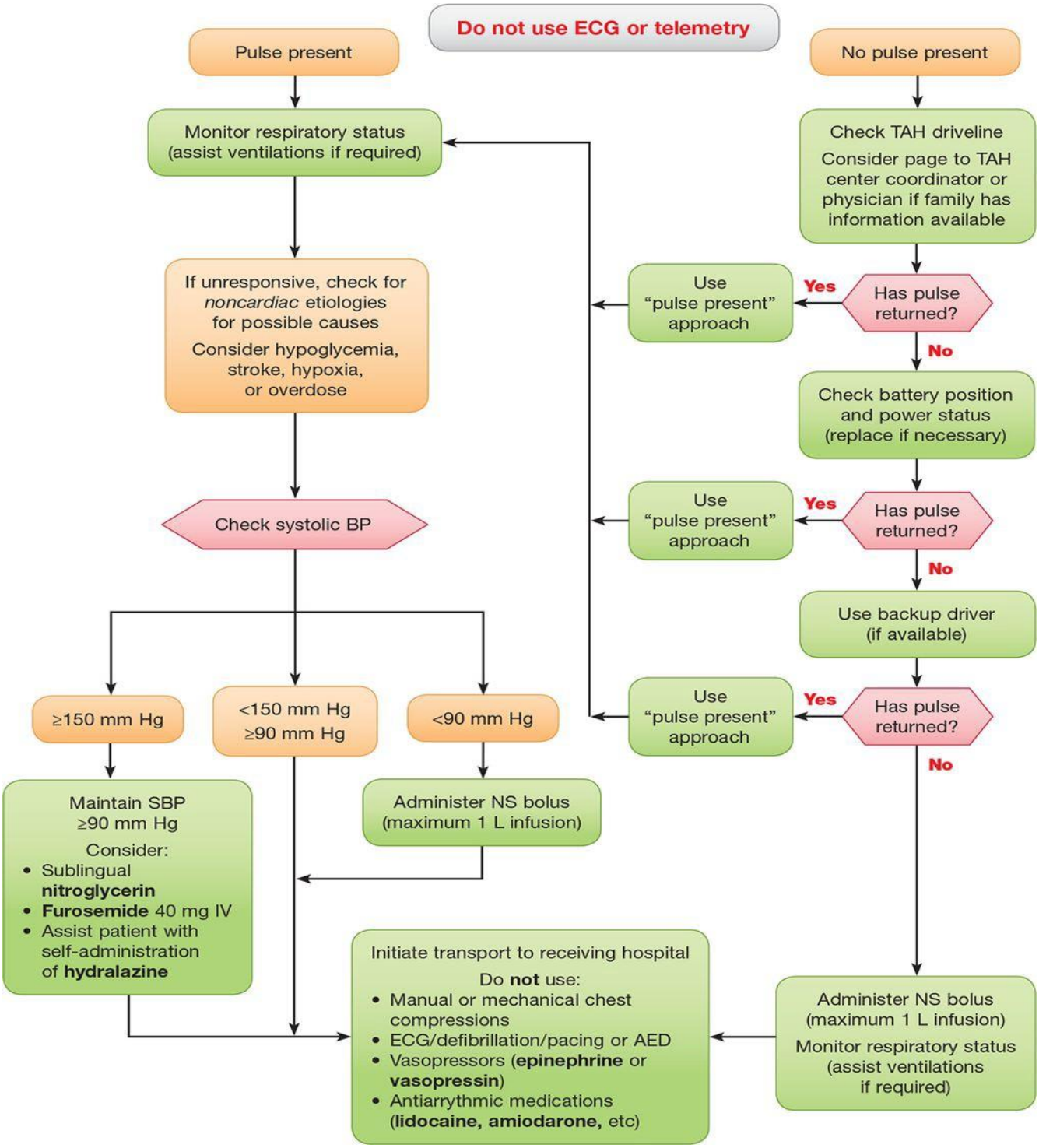
Left Ventricular Assist Device



*The $PETCO_2$ cutoff of >20 mm Hg should be used only when an ET tube or tracheostomy is used to ventilate the patient. Use of a supraglottic (eg, King) airway results in a falsely elevated $PETCO_2$ value.

-

Total Artificial Heart



Indications:

- To establish an emergency airway for patients who cannot provide or protect their own airway or maintain adequate gas exchange.
- Time to arrival at ER doors is greater than or equal to 15min.
- Severe burns to the upper torso and/ or head with a high suspicion of airway compromise secondary to inhalation burns.
- Head trauma with suspected increased ICP and poor respiratory effort.
- Acute pulmonary edema with signs and symptoms of impending respiratory failure.
- Potential Impending Respiratory Failure signs and symptoms include but are not limited to:
    - A respiratory rate Less than 10 or Greater than 30
    - Decreased mentation
    - Decreased respiratory effort.
    - Tachycardia
    - Bradycardia
    - ECG ectopy
    - Pale/Cool/Clammy or Cyanotic Skin Signs
    - SpO2 Less than 85%
    - ETCO2 Less than 20mmHg or Greater than 60mmHg

Contraindications/ Precautions:

- Total upper airway obstruction
- Tracheal obstruction
- Severe angioedema
- Suspected pharyngeal infection (peritonsillar or retropharyngeal abscess)
- Known allergy to induction medications.
- GCS greater than 8 with adequate respiratory effort
- Resuscitate before Intubate
    - Be cautious in the tachycardic and hypotensive trauma patient who has not been adequately resuscitated prior to MAI, as MAI can decrease intrathoracic pressure and prolonged hypoxia can potentiate bradycardia and/or death.

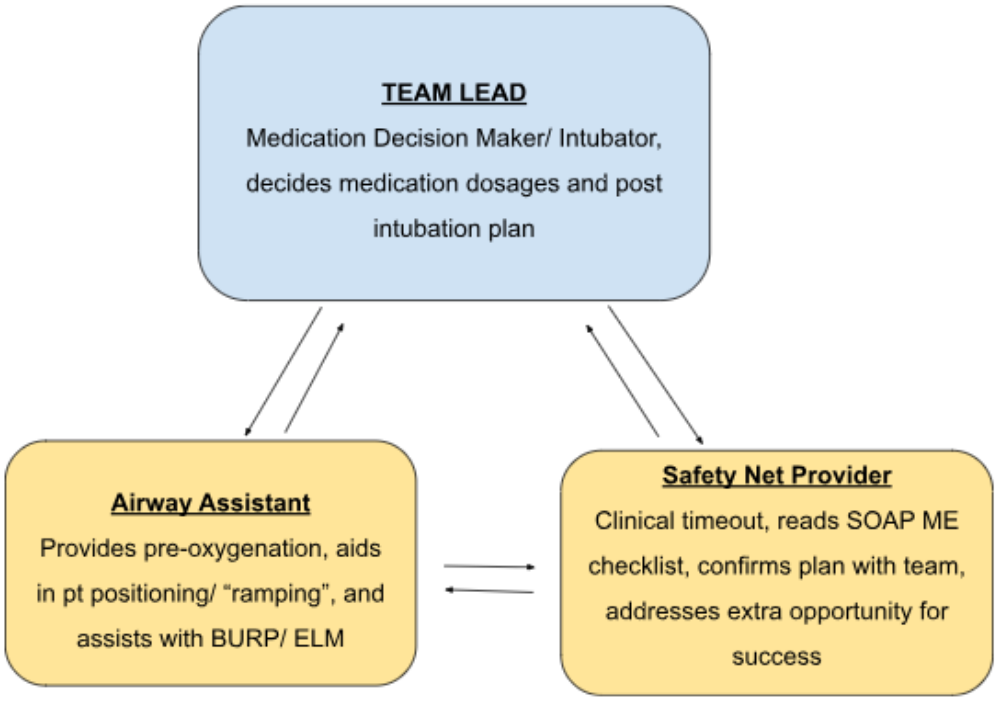
Resources and Procedure:

- X-04 General Airway Management Procedure
- X-04 Airway Time Out Algorithm
- X-04 Medication Assisted Intubation Checklist “SOAP ME”
- Washoe County Protocol A-17 Medication Assisted Intubation
- Washoe County Protocol PD-13 Pediatric MAI

Pearls:

- Resuscitation should precede MAI.
- Consider risk vs. benefit of performing MAI in the field, and whether an ED team might be better prepared to manage a difficult airway. Consider the time of transport and whether the patient will require additional resuscitation. MAI should be considered as a high risk - low frequency procedure.
- Make every attempt to expedite transport. Provide high quality BLS oxygenation and ventilation prior to electing to perform MAI.
- If at any time intubation is unsuccessful and transport has not been initiated, begin rapid transport.

MAI Checklist



SOAP ME

- **Suction:** at least one working suction turned on, prepared for use, and near the patient. **Oxygen:** N/C at 15 LPM and NRB or BVM attached to high flow 02.
- **Airway:** appropriately sized ETT, LMA, and surgical cric kit immediately available and within arm's reach. Use video laryngoscope if available and training has been completed.
- **Pre-Oxygenate and Position:** use passive high flow O2 or BVM assisted ventilations until SpO2 is greater than 93% or highest oxygen level that can be achieved within 2 minutes. Position pt with chin plane horizontal (1), with neck wide open (2), and external auditory meatus and suprasternal notch horizontally aligned (3). Head and shoulders should be slightly elevated, utilize "ramping" to achieve the best view of the vocal cords. Use BURP method and ELM for anterior and difficult airways.
- **Monitoring Equipment/ Medications:** cardiac monitor, pulse oximetry, BP cuff applied to extremity opposite to extremity with IV, medications drawn up and ready to be given. Post DFI medication sedation plan with medication readily available.
- **End Tidal C02**: attached to monitor and prepared for airway confirmation/ monitoring.

***** Peri Arrest patients should be resuscitated prior to MAI *****

***** During MAI use the 'SOAP ME' call and response checklist *****

<u>Needle cricothyrotomy will potentially oxygenate a patient, but does not provide adequate ventilation or airway protection. Any other form of airway control with actual ventilation is preferable.</u>

Indications:

- Children under 12 or pediatric-sized airway that you cannot intubate, cannot insert a rescue airway, cannot ventilate, and cannot maintain adequate oxygenation with BVM.
- Adult airway meeting above criteria that is so deformed that surgical cricothyrotomy is not an option.

Equipment:

- 14 or 16 ga IV catheter (or specialized percutaneous transtracheal device, such as pictured below)
- If using IV catheter: obtain hub from 3.0 ETT 5-10ml syringe.
- Resuscitation Bag (preferably infant size) Gauze 4 x 4s

Procedure:

- Identify landmarks.
- Head in straight alignment with body, slightly extended, if possible.
- Locate cricothyroid cartilage about 1 ½ fingerbreadths below laryngeal prominence (thyroid cartilage).
    - Note: It is sometimes very difficult to identify the cricothyroid notch in children. The needle may be inserted between other tracheal rings.
    - Stay below thyroid cartilage to stay below the vocal cords.
- Prepare skin with chlorhexidine.
- Immobilize the larynx by placing your thumb and long finger on either side of the patient's thyroid cartilage and placing your index finger on the cricothyroid notch.
- Attach IV catheter to 5-10ml syringe.
- Applying gentle suction, slowly insert IV catheter through cricothyroid membrane at 30-degree angle towards the patient's chest.
- Stop when air is freely aspirated.
- Remove syringe and advance catheter into trachea to hub.
- Confirm placement by aspirating air with syringe.
- Place hub of 3.0 ETT onto catheter if IV catheter used.
- For children under 6-12 years of age, deliver oxygen with an infant BVM, squeezing just until the chest rises, **allowing exhalation time in a 1:6 ratio.**

Assessment and care:

- Watch for chest rise and fall with bag-valve device and assess SPO2.
- ETCO2 will not read accurately with a Needle Cric in place and cannot be used as a definitive confirmation of placement.

Indications:

- Possible tension pneumothorax.
    - Tension pneumothorax signs and symptoms:
        - Signs of shock
        - Decreased breath sounds on the affected side.
        - Increasing respiratory distress
        - Decreased SPO2
        - Tracheal deviation.
    - If the patient is intubated, there may be decreasing compliance noted with BVM ventilations or increasing peak inspiratory pressures noted on the ventilator.
- Patients in Traumatic Cardiac Arrest should have needle thoracostomy performed, if indicated by MOI, before resuscitation efforts are ceased.

Contraindications:

- Patients with suspected pneumothorax but without signs of shock or increasing respiratory distres.
    - Monitor the patient closely for this to change.
- Patients whose tension pneumothorax can be relieved by "Burping" an occlusive dressing from an open chest wound or removing a clot that has blocked the vent on a vented seal.
    - Don't make a new hole for air to escape when one already exists from the initial trauma.

Equipment:

- 14-gauge 2 1⁄2-3 1⁄4-inch IV catheter
- Tubing with stopcock
- Heimlich valve

Technique: (Anterior Axillary or Mid Clavicular)

1. Identify the appropriate site on the affected side.
    a. **Primary Site** (Anterior Axillary): between the 5th and 6th rib in the anterior axillary position.
    b. **Secondary Site** (Mid-Clavicular): Between the 2nd and 3rd rib along the midclavicular line on the affected side.
2. Clean the site with Chlorhexidine.
3. Removing the end cap of the 14 ga Long Catheter or spinal needle, insert needle over the top of the selected site's lower or bottom rib.
    a. Inserting the needle over the top of bottom rib helps to avoid the vasculature on the underside of the top rib at the selected site.
4. Advance the needle until a rush of air is heard or a "pop" is felt.
5. Hold the needle in place for approx. 10 seconds to allow intercostal muscles to relax again.
6. Remove the needle, leaving the catheter in place. Attach tubing, three-way stopcock, and Heimlich Valve.
7. Stabilize the catheter (and tubing) with tape and bandage material to ensure it is not dislodged.
8. Evaluate lung sounds, oxygen saturation, and vital signs for improvement.

INDICATIONS:

- To establish an emergency airway for patients who cannot provide or protect their own airway or maintain adequate gas exchange.

CONTRAINDICATIONS:

- Able to protect airway and maintain adequate gas exchange.

EQUIPMENT:

1. BVM with appropriately sized OPA or NPA Nasal Cannula
2. Suction unit
3. Appropriately sized ET tube with stylet and 10 cc syringe ET tube holder
4. End tidal capnography device or quantitative capnometry Laryngoscope with appropriately sized blade.

Procedure:

1. Initially oxygenate patient with BVM and OPA/NPA
2. In addition, pre-oxygenate patients with passive oxygenation via nasal cannula at 15 lpm for approximately two minutes prior to intubation attempt.
3. Open the patient's airway and, holding the laryngoscope in the left hand, insert the blade into the right side of the mouth and sweep the tongue to the left.
4. Using proper technique for the type of blade, lift the tongue and epiglottis and visualize the vocal cords. Have assistant apply cricoid pressure to prevent regurgitation.
5. If necessary, have an assistant apply backward, upward, rightward pressure (BURP) on the thyroid cartilage to help visualize the cords.
6. Slip the ET tube through the vocal cords until the cuff is past the cords.
7. Remove the stylet and inflate the ET cuff with 5-10 cc of air, until balloon is taut. Note the depth of the ET tube at the teeth. A good general rule of thumb is three times the diameter of the tube.
8. Ventilate the patient and auscultate over the epigastrium first for absence of sounds, and then over the lung fields for bilaterally equal breath sounds.
9. Attach the ETCO2 capnography sensor to the tube and secure the tube with a commercial tube holder or tape.

Peri Arrest Management: Push Dose Epinephrine Procedure

The push dose epinephrine procedure is only to be used when delivering care under extreme circumstances to patients who are in danger of imminent death. These patients are defined as having significant clinical decompensation.

Indications:

- To increase or maintain perfusion status, so that life may be sustained in the critically ill or injured patient.
- As a short-acting life-saving intervention to mitigate hypoperfusion in any shock state that is refractory to other resuscitation efforts.
- As a temporizing intervention for the hemodynamically unstable patient.
- Consider using prior to and after medication-assisted intubation. Positive pressure ventilation increases intrathoracic pressure and can impede preload and afterload.
- Used as a bridge to vasopressor infusion therapy when indicated.
- Signs of shock include but are not limited to: ALOC, MAP <65mmHg, Shock Index >1.0, ETCO2 <20 mmHg, pale, cool, clammy skin, and/or poor peripheral pulses.

Precautions:

- During hemorrhagic shock, bleeding control must be immediate. After bleeding has been controlled, use fluids judiciously, give TXA if appropriate, and concurrently with push dose epinephrine if applicable.
- Be thorough when establishing the differential diagnosis in cardiogenic shock as push dose epinephrine may exacerbate symptoms related to ACS, STEMI, and aortic emergencies.
- For sepsis, use fluid resuscitation as a first line treatment for hypoperfusion and consider vasopressor infusion(s) over push dose epinephrine.

Push Dose Epi Preparation:

1. 100 ml Bag with a 1ml Ampule:
    - Add 1mg of Epi (1 mg/mL) to a 100mL NS bag.
    - Lightly mix: the new concentration is 10mcg/mL.
    - Draw up 1 mL (10mcg)
2. 10 mL Flush & Epi Pre-Load:
    - Push 1 ml NS out of your Flush.
    - Attach a 1.5-inch needle to your Flush.
    - Draw up 1 ml of Cardiac Epi Pre-Load into your Flush.
    - Lightly mix: The new concentration is 10mcg/mL.
        - Push 1mL for 10 mcg Epi
3. Established IV/IO with 1000 mL NS Bag already hung and a Cardiac Pre-Load Epi:
    - Push out 9 mL of the Cardiac Epi
    - Attach nearly empty Pre-load Epi to lure lock on IV Tubing.
    - Pinch below the lure lock port and draw up 9 mL NS from the tubing.
    - Lightly swirl the Epi pre-load.
        - Pinch above the lure lock and you can immediately administer 10 mcg/1 mL.

Dosing:

- 10 mcg q 3-5 minutes, total max 3 doses.
- Move to vasopressor infusion therapy with norepinephrine or epinephrine if applicable shortly after the use of push dose epinephrine.

Overview

To provide rapid intravenous medications for a patient in extremis.

Definition:

Pre-existing Vascular Access Device (PVAD): A PVAD is an indwelling catheter/device placed into the lower 1/3 to 1/2 of the superior vena cava to provide vascular access for those patients requiring long-term intravenous therapy or hemodialysis.

PICC Line: Peripherally Inserted Central Catheter usually inserted into the lower Superior Vena Cava via the Antecubital Vein, Basilic Vein or Cephalic Vein.

- *Open Ended Catheters - L-caths, V-caths.*
- *Closed Ended Catheter - Groshong (Blue in color), PASV (white in color)*

PROCEDURE:

Central Chest and PICC lines:

- Never use a syringe with less than a 10 ml barrel for flushing or administering medications through PVADs.
- Prepare medication and NS flush, or IV solution and tubing and purge all air from lines and syringe.
- Wash hands thoroughly and/or cleanse with alcohol.
- Don clean gloves. Identify and discontinue any current IV solution the patient may be receiving. Some medications (Dobutamine, narcotics, etc) may cause a serious adverse reaction if flushed into the patient line, resulting in an unwanted bolus. When indicated, aspirate the contents of the line and discard before flushing.
- Cleanse cap with three (3) Betadine swabs; allow 90 seconds drying if time allows. Follow with three (3) alcohol swabs and allow drying if time allows.
- Flush with 5 ml normal saline. If resistance is met when trying to inject, re-clamp catheter and do not use.

Symptoms	Preventative Measures	Interventions
Infiltration/Extravasation:		
• Pain/stinging at or near the insertion site. • Swelling proximal to or distal to the insertion site. • Puffiness of the dependent part of the limb/body. • Taut, rigid, skin around the insertion site. • Blanching/coolness of the skin around the insertion site. • Damp or wet dressing. • Slowed infusion rate, or infusion stops running.	• Dilute all medications as indicated in their literature. • Secure the catheter so that the site is visible. • Avoid the use of high-pressure infusion pumps, especially when infusing highly irritating or vesicant drugs. • Educate the pt. to report any feelings of burning or pain.	• Stop the infusion.
Dislodgment of Catheter:		
• Leakage from PVAD or exit site. • Increase or decrease in external catheter length.	• Protect PVAD during transport. • Secure loose ends with tape, so PVAD does not get caught and pulled during loading and unloading.	• Secure catheter and extension tubing with tape.
Hemorrhage:		
• Needle/catheter is dislodged. • PVAD is damaged.	• See preventative measures under "Damaged Catheter" below.	• Maintain direct pressure over site for 10 min. (as for arterial bleed).
Damaged Catheter:		
• Leakage from external catheter. • Broken hub • Broken bifurcation • Pockets of swelling along catheter path.	• Always use a minimum of a 10 ml syringe to prevent catheter damage from excess infusion pressure. • Administer medications and flushes without force, regardless of syringe size. • Do not clamp the catheter. • Keep scissors and all sharp objects away from the catheter. • Access the injection ports with a needleless system or use only small bore needles with a length of one (1) inch or less to access the injection port.	• Stop the Infusion. • Do not use the catheter until it has been repaired or replaced.

Symptoms	Preventative Measures	Interventions
Catheter Occlusion/Thrombus or Chemical:		
• Unable to administer fluids. • No flow. • Unable to aspirate. • Persistent high-pressure alarms on infusion pumps. • Visible precipitate/blood in external segment or leaking of fluid from the insertion site. • Sudden onset of resistance or occlusion following incompatible agents. • Tenderness and edema of neck, shoulder, and/or arm on catheter side. Impaired movement of neck and jaw. • Engorged peripheral veins in arm or chest wall.	• Comply with established P & P for the handling & maintenance of the PVAD. • Flush PVAD line after each use. • After blood draw, flush with 20 ml NS, using positive pressure, pulsating technique. • Use infusion pumps, prn. • Do not inject medications or fluids if resistance is met. • When establishing patency, attempt to aspirate 5 ml first, then push 5 ml and if resistance is met, re-clamp catheter and do not use. Dislodging a clot can cause pulmonary embolus or vascular damage. • Mix medications with the appropriate diluent and compatible medication or solutions. • Follow medications with 5 ml normal saline. If open ended catheter, report to ED that PVAD was not flushed with Heparin.	• Stop use of PVAD. • Rule out mechanical obstruction • Kinked tubing • Empty IV bag • Closed clamp • Occluded injection cap • Occluded IV filter • Do not flush or use force to clear the catheter. • Attempt peripheral IV, prn.
Air Embolus:		
• Chest pain. • Cyanosis. • Increased blood pressure and/or pulse rate.	• Do not remove the injection cap. • Make sure the catheter is capped if used for intermittent therapy or when not in use. • Do not allow IV fluids to run dry. • Always expel air from preload syringe prior to administration.	• Clamp line. • Place pt. on left side with head ⍰. • Monitor VS, high flow oxygen. • Attempt peripheral IV, prn.
Catheter Embolus:		
• Shortness of breath or tachypnea. • Confusion or other changes in mental status. Anxiety. • Signs of shock. • Sudden severe pain at insertion site.	• Avoid using forceful flushing or forceful drug push	• Do not allow pt. to move. • High flow O2. • Monitor vital signs & SaO2. • Start peripheral IV immediately.

Indications:

- Suspected isolated midline femur fracture.

Contraindications:

- Suspected fracture of the joints and structures proximal and/or distal to the effected femur.

Equipment:

- Sager splint and all straps

Procedure:

1. Position the Sager splint between the patient's legs, resting the padded saddle against the ischial tuberosity, with the traction handle on the upper side.
    a. Be sure the patient's genitalia is protected and positioned out of the way.
    b. With a unilateral fracture place the head of the splint on the same side as the injury.
    c. With a bilateral fracture, place the head of the splint on the side with the greatest degree of injury.
2. Apply the thigh strap around the upper thigh of the fractured limb and tighten snugly.
3. Lift the spring-loaded clip on the inner shaft of the splint and adjust the length so that the crossbar is level to the patient's heels.
4. Position the ankle harness beneath the heel and just above the ankle.
    a. Fold down cushions on the ankle harness so that it fits snugly around the ankle.
    b. Pull the slack out of the strap connecting the ankle harness to the splint crossbar until it is tight.
5. Grasp the padded shaft of the splint with one hand and the traction handle with the other and gently extend the inner shaft until the desired amount of traction is pulled on the traction scale. Use 10% of the patient's weight per fractured femur up to 7kg (15 lbs.) per leg.
    a. If bilateral fractures are present the max would be 14 kg (30 lbs.)
6. Readjust the thigh strap to make sure it is snug and apply the elastic leg cravats to minimize limb movement.

Assessment and Care:

- Check pulse/capillary refill in foot on affected side during transport.
    - If the patient loses pulse or signs of perfusion, readjust splint immediately.

Indications:

- Airway management in adult and pediatric patients. The Supraglottic Airway Device (SAD) may be initiated for patients requiring airway management or mechanical ventilation.

Contraindications:

- Responsive patients with an intact gag reflex
- Patients with known esophageal disease
- Patients who have ingested caustic substances.

Proper SAD Sizing:

LMA SUPREME AIRWAY SIZING GUIDE

RECOMMENDED WEIGHT-BASED GUIDELINES FOR DETERMINING THE APPROPRIATE LMA SUPREME AIRWAY FOR YOUR PATIENT

ITEM NUMBER	MASK SIZE	PATIENT SIZE	MAXIMUM CUFF VOLUME (AIR)*	MAXIMUM SIZE OG TUBE
175010	Size 1	Neonates/Infants up to 5 kg	up to 5 mL	6 French
175015	Size 1½	Infants 5 - 10 kg	up to 8 mL	6 French
175020	Size 2	Children 10 - 20 kg	up to 12 mL	10 French
175025	Size 2½	Children 20 - 30 kg	up to 20 mL	10 French
175030	Size 3	Children 30 - 50 kg	up to 30 mL	14 French
175040	Size 4	Adults 50 - 70 kg	up to 45 mL	14 French
175050	Size 5	Adults 70 - 100 kg	up to 45 mL	14 French

OG = orogastric tube

*These are maximum volumes that should never be exceeded. It is recommended the cuff be inflated to 60 cm H_2O intracuff pressure.

ALTERNATIVE SIZING METHODS

PALATAL – CRICOID DISTANCE

Hold the LMA Supreme Airway to the side of the patient's face. With the bite block positioned at the level of the palate, the distal tip of the mask should reach the level of the cricoid cartilage.

ORAL AIRWAY COMPARISON

Size the oral airway according to the traditional sizing method (angle of the jaw to the corner of the mouth). Choose the appropriate size LMA Supreme Airway, based on the following:

80 mm oral airway (#3) = Size 3 LMA Supreme Airway
90 mm oral airway (#4) = Size 4 LMA Supreme Airway
100 mm oral airway (#5)= Size 5 LMA Supreme Airway[1]

1. Evaluation of the LMA Supreme: a sizing and troubleshooting study. Allan J Goldman, MD*, Daniel Langille, CRNA*, Michael Flacco, MD**, Michael Hom, MD**, Roxanne Hertzog, MD** *The University of Washington Medical Center (Seattle, WA), ** Outpatient Anesthesia Services (Seattle, WA) (presented at the 2008 Society for Airway Management Annual Meeting)

Procedure:

1. Choose the correct size LMA or SAD.
2. Fully deflate the cuff.
3. Lubricate the back palate-facing surface.
    a. Do not lubricate the bowl of the cuff or the ventilation tube as this may cause the patient to aspirate the lubricant.
4. Open the mouth as wide as you can during insertion.
5. Make sure that the tongue is pushed down, out of the way.
6. A tongue blade or your index finger can be used to keep the lips out of the way as the SAD enters the mouth.
7. Look at the curve of the device and aim the convex side of the curve at the patient's palate.
8. Rotate the device against the palate and around the tongue until you feel the cuff seat against the upper esophageal sphincter in the lower posterior pharynx.
    a. If the tongue gets trapped in the bowl of the SAD device, do not force it in. Gently free the tongue before you push the device into the posterior pharynx.

LMA Supreme™ Insertion Technique

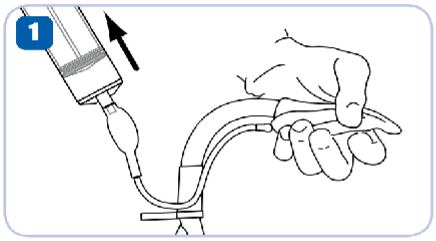


Figure 1: Fully deflate the mask for insertion. Attach a syringe. Compress the distal tip of the mask with thumb and index finger. Apply slight tension to the inflation line while removing all air until a vacuum is felt. Disconnect the syringe.

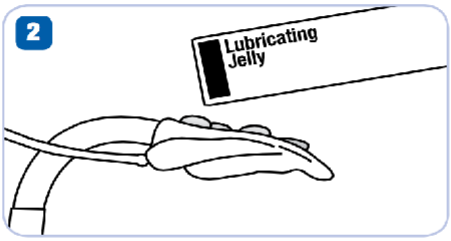


Figure 2: Generously lubricate the posterior surface of the cuff and airway tube.

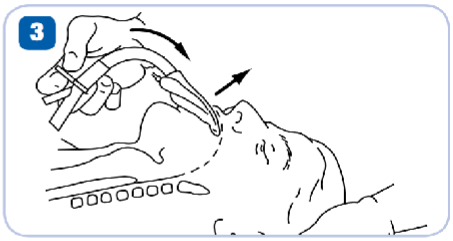


Figure 3: Place the patient's head in a neutral or slight "sniffing" position. Hold the LMA Supreme™ at the proximal end with the connector pointing downward to the chest and the tip of the distal end pointing toward the palate.

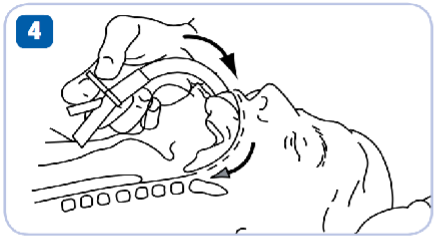


Figure 4: Press the tip of the mask against the hard palate. Maintaining pressure against the palate, continue to rotate the mask inwards in a circular motion following the curvature of the hard and soft palate.

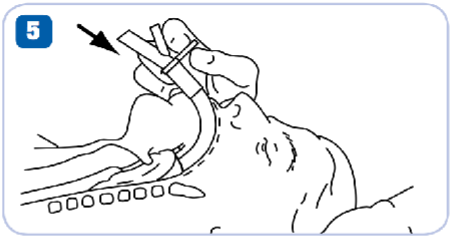


Figure 5: Continue until resistance is felt. The distal end of the mask should now be in contact with the upper esophageal sphincter. The device is now fully inserted.

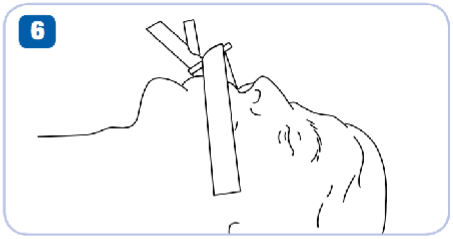


Figure 6*: Maintaining inward pressure, secure the mask into position by taping cheek to cheek across the fixation tab. This should be done prior to inflation. Inflate with the minimum amount of air needed to achieve an effective seal. The recommended intracuff pressure should not exceed 60 cm H_2O.

Verifying Optimal Placement:

- With the SAD verify your two seals:
  - "First Seal" is your ability or inability to ventilate the patient.
  - "Second Seal" is the SAD placed snugly against the upper esophageal sphincter.
- After insertion, the taping tab should be positioned 1 to 2.5cm from the upper lip.
  - If the taping tab is more than 2.5cm from the upper lip, the device may be too big.
  - If the taping tab is less than 1cm from the lip, the device may be too small.
- To check the "Second Seal," apply a small amount of lubricant over the top of the proximal end of the drain tube.
  - If seated correctly, when you manually ventilate the gel should remain covering across the top of the drain tube. It should not bubble or blow off.
  - If it does blow off insert the SAD more deeply and check again.

Indications:

- Cannot intubate.
  -AND-
- Cannot insert LMA.
  -AND-
- Cannot maintain adequate oxygenation with BLS airway.

Contraindications:

- Pediatric – sized airway

Equipment:

- Scalpel with #11 blade
- Bougie
- #6 Endotracheal tube
- Tape, or ties to secure tube
- BVM
- Oxygen source
- Suction
- In-Line ETCO2 tubing
- Gauze 4 x 4s

Procedure:

1. Identify landmarks.
2. Position head in straight alignment with body:
   a. Lightly extended.
   b. If possible, locate cricothyroid cartilage about 1 ½ fingerbreadths below laryngeal prominence (thyroid cartilage).
3. Prepare skin with betadine and alcohol.
4. 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.
5. Make a midline or transverse (vertical or horizontal) incision over the cricothyroid membrane, about 2 cm long, carefully going through skin, subcutaneous tissue, and anterior cervical fascia.
   a. Be careful not to cut through any cartilage.
   b. Assistant uses gauze to control bleeding.
6. Palpate with index finger through incision to identify the cricothyroid membrane.
7. Make a horizontal incision about 1 cm long into the cricothyroid membrane.
8. Hold the scalpel in the incision & place bougie in trachea to guide endotracheal tube.
9. Insert #6 ET tube until cuff is just inside trachea.
10. Inflate the cuff of the ET tube and check tube placement per airway protocol.
11. Secure ET tube with tape or trach ties, ensuring that it is not so tight as to impede venous return.

Assessment and care:

- Confirm tube placement.
- Assess ventilation compliance and oxygenation via SPO2.
- Place ETCO2 monitoring on the tube.
- Watch for and control bleeding at surgical site.

Indications:

- T-piece resuscitator is an O2 tank flow powered emergency resuscitator intended to provide emergency respiratory support by means of a face mask or an advanced airway. It is intended for use with neonates and infants weighing less than 10kg (22 lbs.)

Contraindication:

- Needle Cricothyroid airway is incompatible with Neo-T Resuscitator.

Procedure:

1. Connect oxygen tubing to a regulator and set it to 10 LPM.
2. Set PIP to 25 and PEEP to 5
    - PIP: Keep red cap in place at the PEEP dial end and set PIP to 25 by adjusting the Gas Inlet Dial proximal to the O2 tank regulator while occluding the hole on top of the PEEP dial.
    - PEEP: Next set the PEEP to 5 by adjusting the distal dial from the regulator. When your finger is no longer occluding the hole above the PEEP dial the resting point of the needle should land at approx. 5 on the distal manometer.
3. Connect T-Piece PEEP end to mask and place with a good seal over the patient's airway or connect the same point to an established advanced airway or an inline ETCO2 connection piece.
    - When making the seal, be sure to avoid occluding the patient’s neck with the blade of your hand.
4. Resuscitate by placing and immediately removing thumb or index finger over the hole, on top of the PEEP dial, to allow inspiration and expiration at the desired respiratory rate (approx. 60 breaths per min).

Warnings:

- Assure a good mask seal and proper mask size.
- The recommended gas flow range per manufacturer is from 5 – 15 LPM. Do not exceed 15 LPM.
- Users should fully uncover the Positive End Expiratory Pressure (PEEP) dial hole as soon as the breath is delivered. Failure to do so will result in an extended breath, which may prevent exhalation.
- Remove the protective caps from the T-piece circuit prior to connecting the T-piece to the mask or advanced airway and before patient use.
- Adjusting input flow rate will affect Peak Inflation Pressure (PIP) and PEEP. Devices can achieve high PEEP, **DO NOT EXCEED A PEEP OF 10cmH2O**
- **DO NOT** use with a Needle Cricothyroid Airway.
- Device is a single patient use item. Discard appropriately after use.

Indications:

- Unable to gain venous access in a newborn.

Contraindications:

- None

Equipment:

- 5 ml Normal Saline Pre-filled syringes (2) 1" Tape
- Twill Tape (10" long) (1)
- Scalpel (1)
- Betadine Preps (2)
- UVC Dual Lumen 5 Fr Umbilical Catheter with attached 3-way stopcock.

Procedure:

1. Maintain sterile technique throughout the procedure.
2. Clamp cord at least 3-4 inches from neonate's abdomen
3. Tie umbilical tape around base of cord and gently snug it to control bleeding.
4. Make as clean a cut as possible through cord about 1 inch from neonate's abdomen.
5. Wipe the cut end of the cord with alcohol/chlorhexidine.
    - Take caution to not splash chlorhexidine onto neonate's skin.
        - If splash noted, wipe off with alcohol.
6. Measure for depth of insertion by measuring the distance of the cord plus 1-4cm (2cm) to that measurement and mark with a piece of tape.
7. Identify umbilical vein.
    - In most neonates, there are two small arteries and one larger, floppier vein.
8. Flush UVC catheter with NS to prevent accidental air embolus.
9. Insert 5 Fr UVC Catheter towards the patient's head to approximately one inch beyond the abdominal surface.
    - It may be helpful to stabilize the cord by holding it at the base and applying gentle traction.
10. Gently apply negative pressure on end of feeding tube with syringe, watching for blood return
11. Tape distal portion of catheter to abdomen
12. Administer fluid and medications in a bolus fashion.

Assessment and care:

- Once a UVC catheter has touched the skin of the patient's abdomen, it can no longer be advanced.
    - It is to be considered unsterile; it can still be withdrawn.
- Ensure that the UVC catheter is not advanced more than 1 inch beyond the abdomen for risk of injuring the liver.
- Maintain strict aseptic technique.
- Any medications or fluids that can be given IV can be given through a UVC.
- If the UVC catheter has been inadvertently inserted into an umbilical artery (UAC), rescue medications and fluid may still be given through it.

EMERGENCY GUIDE

2020-2021

International Consortium of Circulatory Assist Clinicians

This guide was created in 2008 by the innovation of VAD Coordinators from some of the largest and most successful VAD implantation hospitals in the United States. ICCAC has ensured that this document continues to be a current resource for not only emergency medical services but to all healthcare workers providing care to the mechanical circulatory support patient population. The purpose is to be a quick emergency guide and should not replace the manufacturers' Instructions For Use as the primary source of information for each device listed in this guide.

Questions and Answers
MECHANICAL CIRCULATORY SUPPORT

Mechanical Circulatory Support Devices (MCS) are heart pumps that move blood from the heart to the body. They are temporary or permanent devices that either supplement or replace the action of a failing heart. MCS devices implanted are assisting the left ventricle (LVAD), the right ventricle (RVAD), or both ventricles (BiVAD) and the total heart (Total Artificial Heart – TAH). They consist of two major categories: Pulse generating (pulsatile) and pulseless devices (non-pulsatile/continuous flow). Patient management varies greatly between the two device categories.

Pulsatile or Non-pulsatile

Pulse generating devices have a chamber that fills with blood and ejects the blood similar to the rhythmic action of the human heart. These devices replace the majority of the heart and move the full amount of blood the patient needs. The Total Artificial Heart pump is a pulse generating device. Non-pulsatile or continuous flow devices use a motor at a fixed speed leading to a constant ejection of blood to the body. This is the reason patients with continuous flow VADs often lack a pulse upon palpation. The most common VADs are non-pulsatile/continuous flow devices.

What is a VAD?

A ventricular Assist Device (VAD) is an implantable mechanical heart pump that helps to pump blood from the lower chambers of the heart to the rest of the body in patients with advanced heart failure. The device helps move partial or full amount of blood meeting the patient needs. These devices can be attached to the Left (LVAD) or Right (RVAD) ventricles of the heart. Most patients have an LVAD and less common are RVADs and BiVADs (both left and right or Biventricular support).

What are the parts of a VAD?

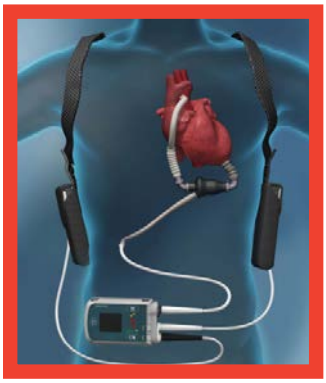
All VADs have at least 4 components. (1) A heart pump unit consisting of a short tube placed inside the ventricle pulling blood thru the pump and out a tube, delivering blood to the body's great vessel; (2) A power cord called a driveline that exits the abdomen and connects to a controller and power source; (3) A controller that displays information; (4) A power source.

What does the controller do?

The controller is a computer that operates the heart pump. It provides messages and audible alarms to help monitor the pump. It gives information about pump performance such as blood flow through the pump (L/min), pump speed (RPM) and the amount of power consumed (Watts). It also gives warnings and alarms if there is an alert/problem with the pump or with the power source, such as low battery or low flow.

What is the power source?

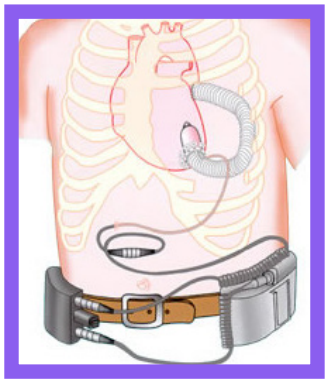
All VADs can be powered by two power sources: rechargeable batteries or AC (electricity) power. Batteries are used when patients are active throughout the day and often are kept in a holster, vest or belt for safety. AC power is recommended when the patient is planning to remain stationary. AC power should NOT be used when transporting the patient.



HEARTMATE II Page 4

HEARTMATE 3 Page 9

HEARTWARE HVAD Page 13



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What is a TAH?

A Total Artificial Heart (TAH) is a mechanical device that replaces the two lower ventricles of the heart. Tubes connect the TAH to a power source that is outside the body. The TAH then pumps blood through the heart's major artery to the lungs and the rest of the body. This is used for people who have inadequate function of both ventricles (biventricular failure).

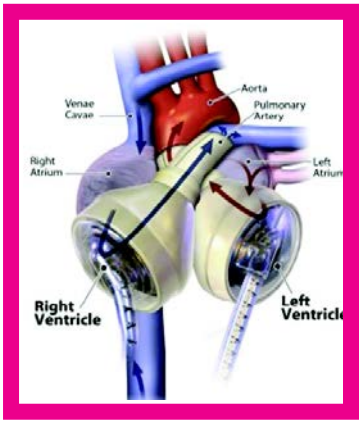
What are the parts of TAH?

The TAH has 3 components. (1) A pump assembly consisting of 2 short tubes attached to the top of the heart and 2 chambers that fill and empty using air that pushes and pulls a membrane back and forth; (2) Air tubes that exit the body and attach to a console; (3) A power source.

What is the power source?

The TAH uses a mobile console called a Freedom Driver when patients are ambulatory. The console is powered by two batteries or AC (electricity) power. The batteries must be well charged before moving the patient and the AC plug should be brought when transporting.

The devices in this MCS Emergency Guide are color coded for quick identification. Patients may have a color matching tag or identifier on their equipment or equipment bag. Patients will also have their primary VAD team contact information for an important resource.



TOTAL ARTIFICIAL HEART (TAH) Page 25

Patient Management For VADs

1. Treat the patient and follow your protocols. Do not focus only on the device. Most patients do not have a primary pump malfunction. Common MCS patient problems that arise are stroke, bleeding disorders (GI, nose bleeds), arrhythmias, dehydration and right heart failure.

2. Assess the patients airway and intervene per your protocol.

3. Auscultate heart sounds to determine if the device is functioning. If it is continuous flow device, you should hear a "humming sound".

4. Assess vital signs. Non-pulsatile or continuous flow devices provide continuous blood flow from the heart to the aorta. This continuous flow results in a narrow arterial pulse pressure. This means it may be difficult to obtain a pulse or blood pressure reading which may be a normal state for a continuous flow device patients. To obtain a blood pressure an automated cuff or doppler method can be used. If unable to obtain with automated cuff use the mean BP with a doppler (first sound you hear – MAP). Rely on other methods to assess perfusion e.g. mental status, skin color, capillary refill. The device flow shown on the controller display reflects the patient's cardiac output.

5. Start IV if indicated.

6. Assess the device for device information and alarms located on the controller display.

7. Intervene appropriately based on the type of alarm. See specific device alarm guides on the pages that follow.

8. Refer to the patient's medication list. They are typically, but not always, on anticoagulation and antiplatelet therapy.

9. Call the VAD Center's 24 hour emergency number on the patient's contact list, controller/equipment, or emergency bag for assistance in the management of the patient and transportation determination and location.

10. **Bring all of the patients equipment.**

11. **Bring the significant other if possible to act as a expert on the device in the absence of consciousness in the patient.**

HeartMate II™ Left Ventricular Assist System

1. **Can I do CPR?**

   Yes, in the right clinical scenario. Chest compressions may pose a risk of dislodgement - use clinical judgment. If compressions are administered, confirm function and positioning of the pump.

2. **Can the patient be defibrillated while connected to the device?**

   Yes you can defibrillate, and you do not have to disconnect anything.

3. **Can this patient be externally paced?**

   Yes.

4. **What type of alarm occurs in a low flow state?**

   A red heart alarm indication and steady audio alarm will sound if less than 2.5 lpm. Can give a bolus of normal saline and transport to a VAD center.

5. **Can I change the speed of the device?**

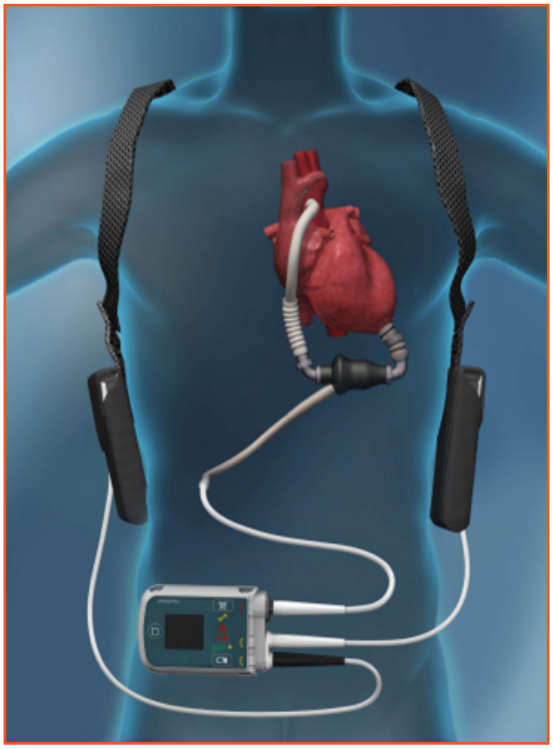
   No, it is a fixed speed.

6. **Does the patient have a pulse with this device?**

   Likely they will not because it is a continuous flow device, however some patients may have a pulse.

7. **What are acceptable vital sign parameters?**

   MAP 70 - 90 mm Hg with a narrow pulse pressure.

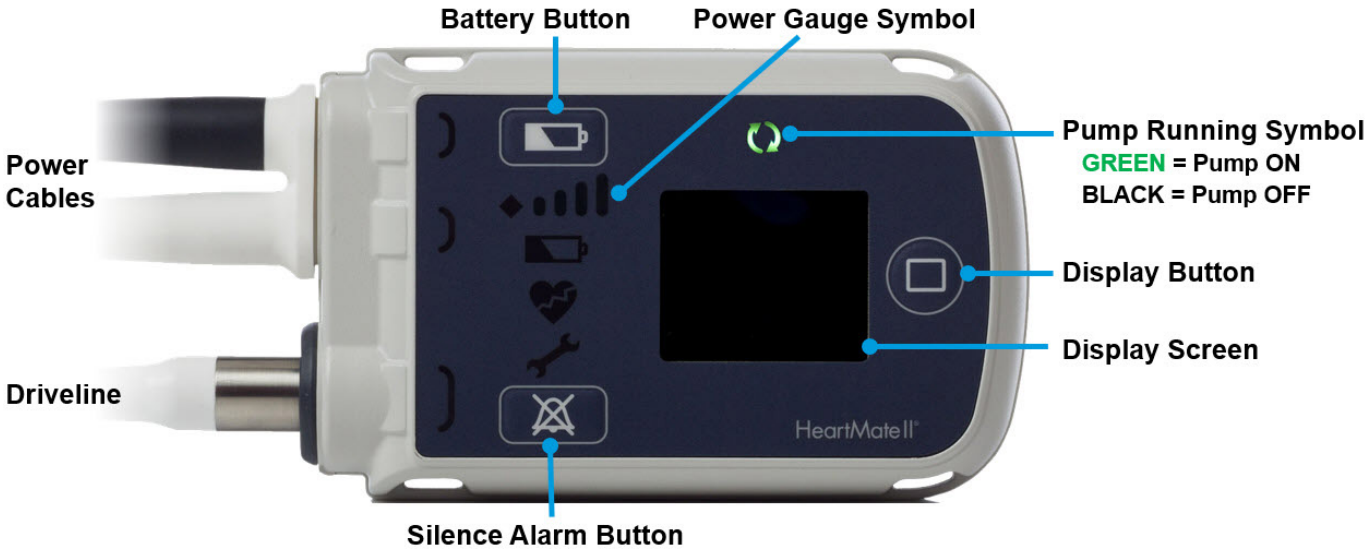


Frequently Asked Questions

- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to driveline exiting patient's abdominal area and is attached to controller which runs the pump.
- Pump does not affect ECG.
- All ACLS drugs may be given.
- No hand pump is available.
- A pair of fully charged batteries last approximately 10 - 12 hours.
- Avoid pulling, twisting, or kinking the driveline when strapping the patient to a stretcher.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring **ALL** of the patient's equipment with them.

HeartMate II™ Left Ventricular Assist System

System Controller



Changing Batteries

WARNING: At least one controller power cable must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each battery can be assessed by pressing the button on the battery. Fully charged batteries will display 5 lights. (Figures 1 and 2)

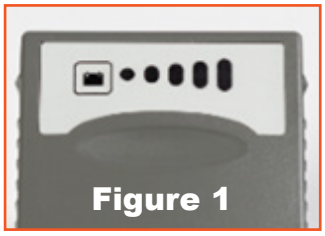


Figure 1

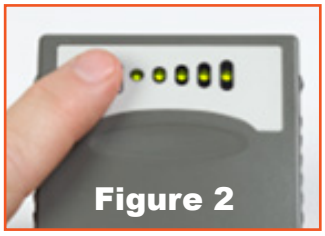


Figure 2

- Check the power level on the batteries, replace the battery with the fewest lights first. Remove only ONE battery from the clip by pressing the release button on the clip to unlock the battery. (Figure 3)

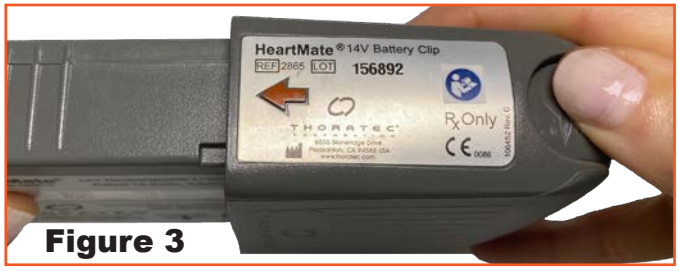


Figure 3

- Controller will start beeping and flashing yellow symbols and will read **CONNECT POWER** on the front screen.

- Insert a new, fully charged battery into the empty battery clip by aligning the **RED** arrows on the battery and clip (Figure 4). The battery will click into the clip. Gently tug on battery to ensure connection. If the battery is properly secured, the beeping and yellow flashing will stop.


Figure 4

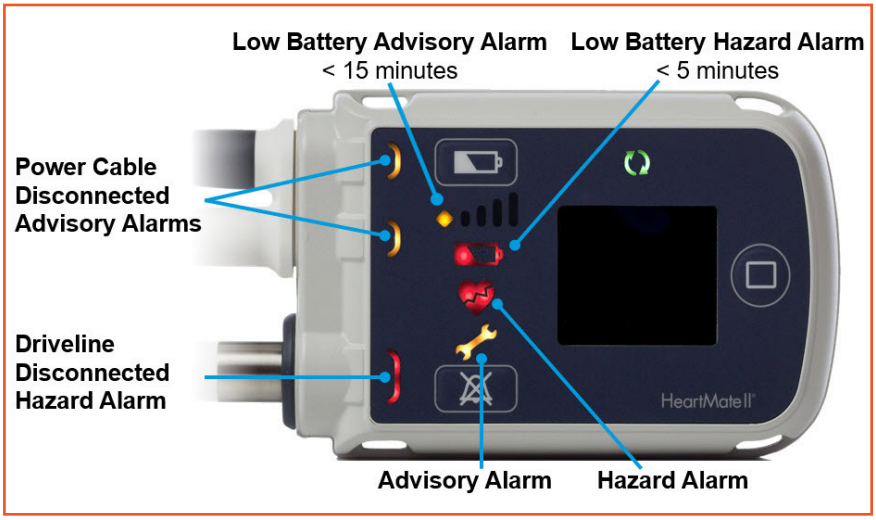
- Repeat previous steps with the second battery and battery clip.

Troubleshooting HeartMate II™ LVAS

Alarms: Emergency Procedures

When an alarm occurs:

- Contact the Implant Center for direction when possible.
- Check alarm messages on controller display screen.
- Check if pump is running:
- Allow care providers trained on LVAD emergencies to remain with the patient.



When the Pump Has Stopped

- Check the driveline and power cable connections to the controller. Fix any loose connections to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (*see Changing Batteries section on previous page*)
- If pump does not restart, change controllers if directed by implant center. (*see Changing Controllers on next page*)
- Be sure to bring ALL of the patient's equipment with them.

HAZARD ALARMS		Continuous Audible Tone
Low Flow :03 + Call Hospital Contact :07	Pump is off.	See above, when pump has stopped
	Pump flow is < 2.5 lpm.	Ensure that a power source is connected to the controller. Evaluate the patient for low flow - treat the cause. Assess volume status, hypertension, arrhythmia, right heart failure, etc.
Connect Driveline :02	Driveline disconnected.	Immediately reconnect Driveline to the controller. Check modular cable connection.
Connect Power Immediately :05 + Backup Battery :01	Both power cables are disconnected.	Immediately connect to batteries or the Mobile Power Unit.
Low Battery :06 + Replace Power :02	Low Battery Power < 5 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.

ADVISORY ALARMS		Intermittent Audible Tone
Low Battery :06 + Replace Power Immediately :02	Low Battery Power <15 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
Connect Power :04	A power cable is disconnected.	Reconnect the power cable to power.
Check display for alarm type.		Call VAD Coordinator at implant center for direction.

Troubleshooting HeartMate II™ LVAS

Changing the System Controller

Step 1: Have the patient sit or lie down since the pump will momentarily stop during this procedure.

Step 2: Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.

Step 3: Attach the battery clips to the replacement controller by lining up half circles, firmly pushing together, and tightening connector nut. Insert the batteries into the clips by aligning the **RED** arrows.

Step 4: On the back of the replacement controller, slide the safety lock so the red release button is fully visible. Repeat this step on the original controller.

Step 5: Disconnect the drive-line from the original controller by pressing the red release button and pulling it out. The pump will stop and an alarm will sound. **Note:** The alarm will continue until the original controller is turned off. You can silence the alarm by pressing the silence alarm button.

Getting the replacement controller connected and the pump restarted is the first priority!

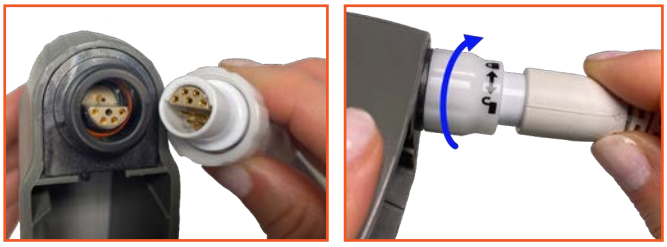
Step 6: Connect the replacement Controller by aligning the YELLOW ARROWS on the driveline and replacement Controller and firmly pushing the driveline into the replacement controller. The pump should restart, if not complete the following steps:

- Firmly press the Silence Alarm or Battery Button to restart the pump.
- Check the power source to ensure that power is going to the controller.
- Ensure the driveline is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the driveline.

Step 7: After the pump restarts, slide the safety lock on the new controller so the red release button is fully covered. If unable to close the safety lock into fully locked position, gently push the driveline into the controller to ensure proper connection. Retry to close safety lock.

Step 8: Disconnect power from the original Controller.

Step 9: Hold down battery symbol for 5 full seconds to turn off the original controller.



Step 3

Step 4

Step 7

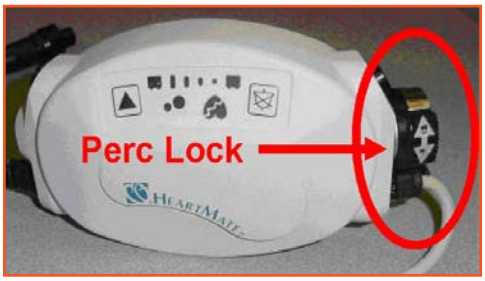
Step 5

Step 6

Step 9

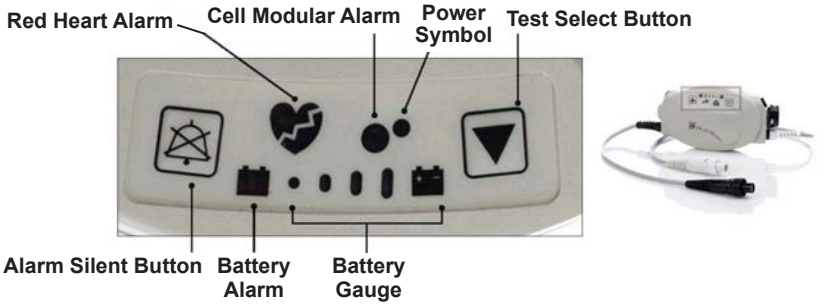
HeartMate II™ Left Ventricular Assist System

The following information applies to the original controller version called External Peripheral Controller (EPC). Some patients have this controller.



Driveline Connection: The Perc Lock must be "unlocked" in order for the driveline to be removed in a controller exchange. The Perc lock remains in locked position once the driveline has been fully inserted.

External Peripheral Controller (EPC)



2 MODES: ON, OFF

On: Driveline+Power source connected.

Off: No driveline or power source connected.

CELL MODULE BATTERY

No backup battery. The cell module battery powers an audible tone if EPC is removed from power while the driveline is connected. The cell module battery is supplied STERILE.

EVENT LOGGER

EPC does not include date/time records in event history. EPC can store 120 events.

GREEN POWER SYMBOL

Green light only mead that the controller is receiving power. Listen over the pump pocket for confirmation that the pump is running.

CONTROLLER BUTTONS

Alarm Silence Button: Displays the battery fuel gauge. Also silences hazard alarms for 2 minutes and advisory alarms for 4 hours.

Test Select Button: Activates a self test when held for 3 seconds.

Note: EPC does not include a display button or user interface screen. The Display Module is used to view pump parameter and alarm events.

SELF TEST

Press and hold the Test Select Button for 3 seconds.

LOW POWER

Yellow Battery Symbol: Displayed when only 15 minutes of external power is remaining.

Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.

POWER SAVER MODE:

Entered when the battery voltage falls to a critically low level. Pump Speed is reduced to 8000 RPM.

STARTING THE PUMP

>8000 RPM: Pump starts automatically.

<8000 RPM: Start pump by pressing Alarm Silence Button or Test Select Button on EPC.

SYSTEM MONITOR EVENT HISTORY SCREEN

PI Event:

System Information:

COMPATIBILITY

System Monitors I and II, Power Module, Power Base Unit (PBU), Power Module Patient Cable (12 Volt and 14 Volt), 14 Volt Lithium-ion Batteries and Battery Clips, 12 Volt SLA and NiMH Batteries and Clips.

ALARMS

For a review of alarms and their meanings, reference the HeartMate II Alarms for Clinicians, Item 103851. Note that EPC does not include Driveline fault detection.

A battery clip can be attached to the EPC controller by lining up the half moons and gently pushing. Batteries can be attached to the battery clip by aligning the RED arrows on the battery and clip.

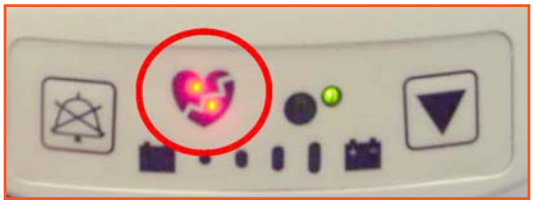
External Peripheral Controller (EPC): A percutaneous lock is located on the side of the controller.

Unlock

Locked

Alarms: Emergency Procedures

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed on page 5.



Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on page 5.

HeartMate 3™ Left Ventricular Assist System

1. **Can I do CPR?**

   Yes, in the right clinical scenario. Chest compressions may pose a risk of dislodgement - use clinical judgment. If compressions are administered, confirm function and positioning of the pump.

2. **Can the patient be defibrillated while connected to the device?**

   Yes you can defibrillate, and you do not have to disconnect anything.

3. **Can this patient be externally paced?**

   Yes.

4. **What type of alarm occurs in a low flow state?**

   A red heart alarm indication and steady audio alarm will sound if less than 2.5 lpm. Can give a bolus of normal saline and transport to a VAD center.

5. **Can I change the speed of the device?**

   No, it is a fixed speed.

6. **Does the patient have a pulse with this device?**

   Likely they will not because it is a continuous flow device, however some patients may have a pulse.

7. **What are acceptable vital sign parameters?**

   MAP 70 - 90 mm Hg with a narrow pulse pressure.

FAQs

- Pump has “artificial pulse” created by rapid speed changes in the pump. This can be heard when auscultating the heart and differs from other continuous flow devices.
- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to driveline exiting patient’s abdominal area and is attached to controller which runs the pump.
- Pump does not affect ECG.
- All ACLS drugs may be given.
- A pair of fully charged batteries lasts up to 17 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Avoid pulling, twisting, or kinking the driveline when strapping the patient to a stretcher.
- Be sure to bring **ALL** of the patient’s equipment with them.

The HeartMate 3™ LVAD has a modular cable connection near the exit site of the driveline (Figure 1). This allows a damaged driveline to be quickly replaced (if damage is external).

- When disconnecting a driveline, NEVER use the modular cable connection.
- If the modular cable requires replacement, it must be done at and by the implanting center. Patients are not given a backup modular cable.
- If the connection is loose, a yellow line at the connection will be showing. If the line is visible, turn the connector in the locked direction. It will ratchet and stop turning once tight.

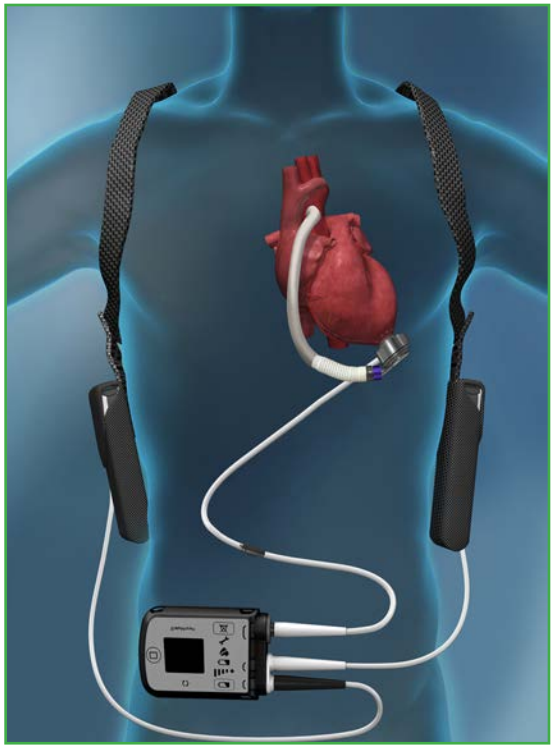
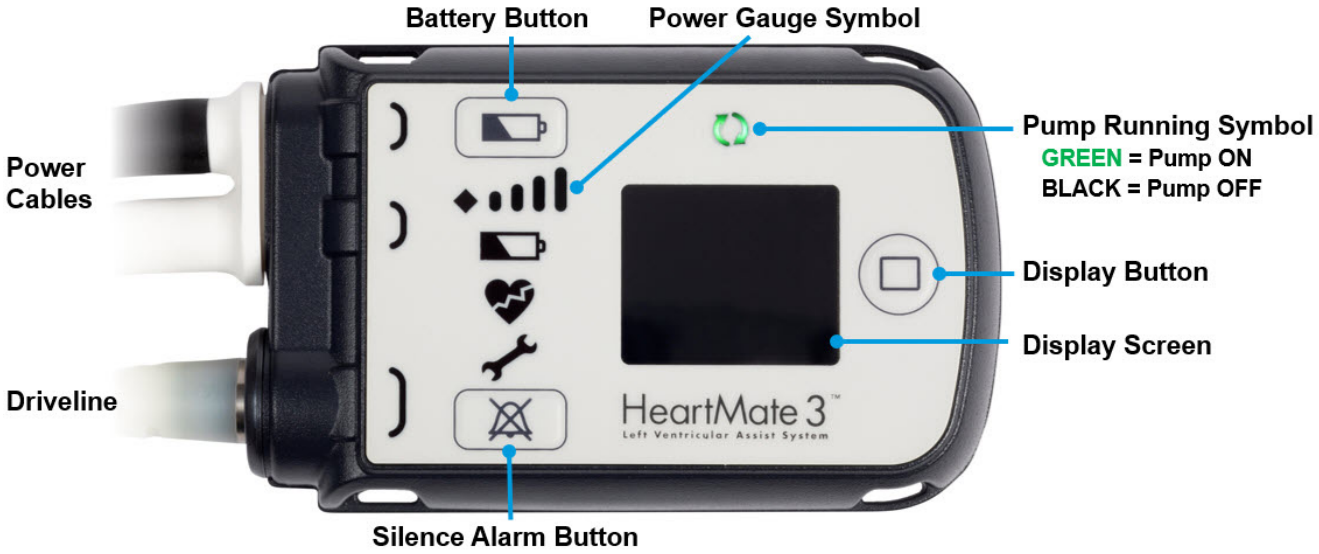


Figure 1

HeartMate 3™ Left Ventricular Assist System

System Controller



Changing Batteries

WARNING: At least one controller power cable must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each battery can be assessed by pressing the button on the battery. Fully charged batteries will display 5 lights. (Figures 1 and 2)

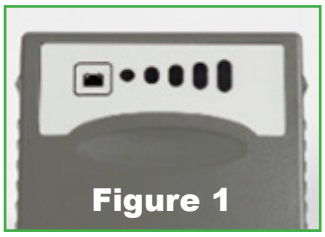


Figure 1

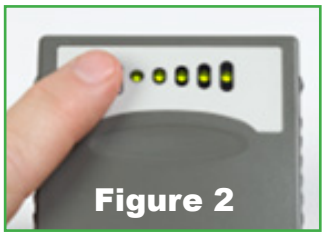


Figure 2

- Check the power level on the batteries, replace the battery with the fewest lights first. Remove only ONE battery from the clip by pressing the release button on the clip to unlock the battery. (Figure 3)

Figure 3

- Controller will start beeping and flashing yellow symbols and will read **CONNECT POWER** on the front screen.

- Insert a new, fully charged battery into the empty battery clip by aligning the **RED** arrows on the battery and clip (Figure 4). The battery will click into the clip. Gently tug on battery to ensure connection. If the battery is properly secured, the beeping and yellow flashing will stop.


Figure 4

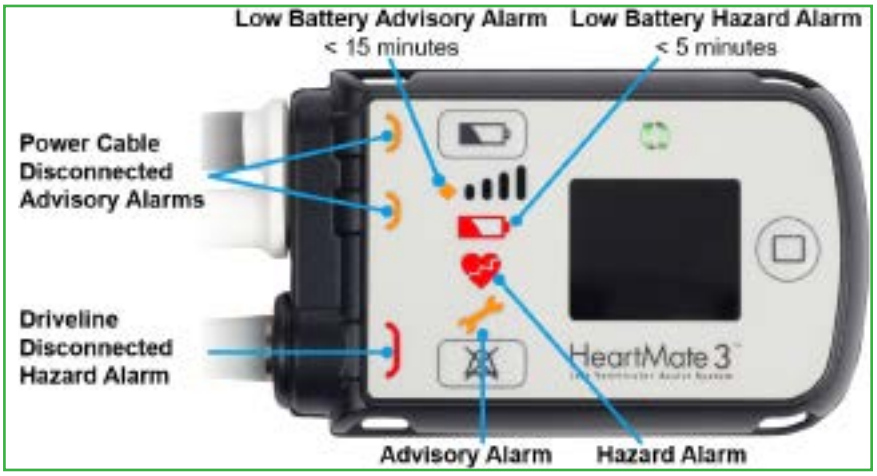
- Repeat previous steps with the second battery and battery clip.

Troubleshooting HeartMate 3™ LVAS

Alarms: Emergency Procedures

When an alarm occurs:

- Contact the Implant Center for direction when possible.
- Check alarm messages on controller display screen.
- Check if pump is running:
- Allow care providers trained on LVAD emergencies to remain with the patient.



When the Pump Has Stopped

- Check modular cable connection, driveline and power cable connections to the controller. Fix any loose connections to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (see Changing Batteries section on previous page)
- If pump does not restart, change controllers if directed by implant center. (see Changing Controllers on next page)
- Be sure to bring ALL of the patient's equipment with them.

HAZARD ALARMS		Continuous Audible Tone
Low Flow :03 + Call Hospital Contact :07	Pump is off.	See above, when pump has stopped
	Pump flow is < 2.5 lpm.	Ensure that a power source is connected to the controller. Evaluate the patient for low flow - treat the cause. Assess volume status, hypertension, arrhythmia, right heart failure, etc.
Connect Driveline :02	Driveline disconnected.	Immediately reconnect Driveline to the controller. Check modular cable connection.
Connect Power Immediately :05 + Backup Battery :01	Both power cables are disconnected.	Immediately connect to batteries or the Mobile Power Unit.
Low Battery :06 + Replace Power :02	Low Battery Power < 5 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
ADVISORY ALARMS		Intermittent Audible Tone
Low Battery :06 + Replace Power Immediately :02	Low Battery Power <15 min. remaining.	Immediately replace batteries or switch to the Mobile Power Unit.
Connect Power :04	A power cable is disconnected.	Reconnect the power cable to power.
Check display for alarm type.		Call VAD Coordinator at implant center for direction.

Troubleshooting HeartMate 3™ LVAS

Changing the System Controller

Step 1: Have the patient sit or lie down since the pump will momentarily stop during this procedure.

Step 2: Place the replacement Controller within easy reach,along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.

Step 3: Attach the battery clips to the replacement controller by lining up half circles, firmly pushing together, and tightening connector nut. Insert the batteries into the clips by aligning the **RED** arrows.

Step 4: On the back of the replacement controller, slide the safety lock so the red release button is fully visible. Repeat this step on the original controller.

Step 5: Disconnect the drive-line from the original controller by pressing the red release button and pulling it out. The pump will stop and an alarm will sound. Note: The alarm will continue until the original controller is turned off. You can silence the alarm by pressing the silence alarm button.

Getting the replacement controller connected and the pump restarted is the first priority!

Step 6: Connect the replacement Controller by aligning the WHITE ARROWS on the driveline and replacement Controller and firmly pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

- Firmly press the Silence Alarm or Battery Button to restart the pump.
- Check the power source to ensure that power is going to the controller.
- Ensure the driveline is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the driveline.

Step 7: After the pump restarts, slide the safety lock on the new controller so the red release button is fully covered. If unable to close the safety lock into fully locked position, gently push the driveline into the controller to ensure proper connection. Retry to close safety lock.

Step 8: Disconnect power from the original Controller.

Step 9: Hold down battery symbol for 5 full seconds for complete shutdown of old controller.

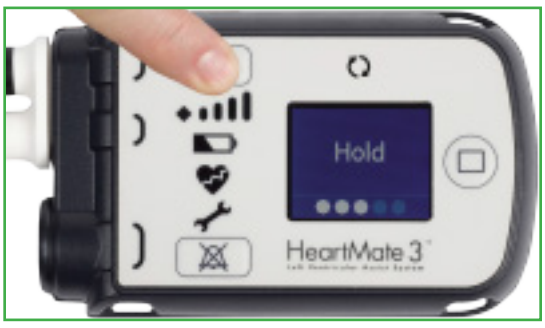
Step 3

Step 4

Step 7

Step 5

Step 6



Step 9

HeartWare™ HVAD™ System

1. **Can I do CPR?**

   Yes, in the right clinical scenario. Chest compressions may pose a risk due to pump location and position of the outflow graft on the aorta - use clinical judgment. If chest compressions have been administered, confirm function and positioning of HVAD Pump.

2. **Can the patient be defibrillated while connected to the device?**

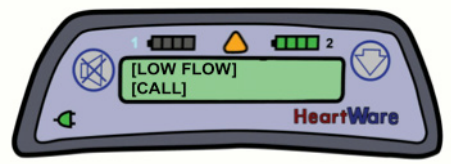
   Yes, you can defibrillate, and nothing needs to be turned off or disconnected.

3. **Can this patient be externally paced?**

   Yes.

4. **What type of alarm occurs in a low flow state?**

   If a low flow state occurs, an alarm will be heard, and the controller display will show a yellow triangle and [Low Flow] [Call] message.



5. **Can I change the speed of the device?**

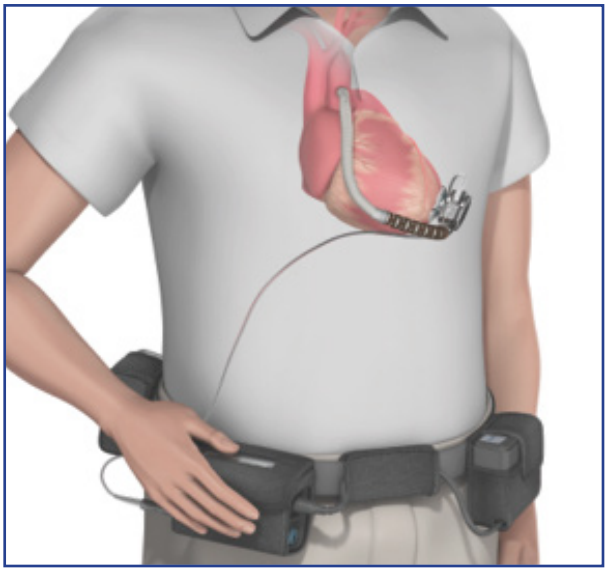
   No, the device runs at a fixed speed. It is not possible to adjust the pump speed in the pre-hospital setting.

6. **Does the patient have a pulse with this device?**

   Likely they will not because it is a continuous flow device, however some patients may have a pulse.

7. **What are acceptable vital sign parameters?**

   For patients with a palpable pulse, MAP targets should be ≤ 85 mm Hg. For patients without a palpable pulse, a manual cuff and a doppler is the preferred method with a MAP target of ≤ 90 mm Hg. If you are using a doppler, place the blood pressure cuff on the patient arm. As you release the pressure in the blood pressure cuff, the first sound you hear with the Doppler is the MAP. If that is not available, use a non-invasive BP (NIBP).



FAQs

- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to electric line (driveline) exiting patient's abdominal area and is attached to controller which runs the pump.
- Pump does not affect ECG, but patient may or may not be symptomatic even with ventricular arrhythmias.
- All ACLS drugs may be given.
- This is a rotary (continuous flow) pump with typical speed ranges of 2400 – 3200 RPMs. The patient should have back-up equipment e.g. controller & charged batteries.
- The controller draws power from one battery at a time. A fully charged battery will provide 4-7 hours of power. Both the battery and controller have status lights to indicate the amount of power remaining.
- Transport by ground or flight to the implanting facility if possible.
- Be sure to bring **ALL** of the patient's equipment with them. e.g. back-up controller, charged batteries, ac adapter and charger.

HeartWare™ HVAD™ System

Driveline

Power Source #2

Battery Charge Indicator

ALARM ADAPTER

- Used to silence the [No Power] alarm.
- Should only be used on a controller that is NOT connected to a patient's pump.
- Insert into data port covered with a dust cap of the original controller after a controller exchange BUT before the power sources are disconnected or the [No Power] alarm will sound for up to two hours.

Red Alarm Adapter

DRIVELINE CONNECTION

To Connect to Controller:

- Align the two red marks and push the driveline connector straight into the silver driveline port. (Figure A)
- The Driveline Cover must completely cover the Controller's silver driveline connector to protect against static discharge. (Figure B)

Figure A

Figure B

NOTE: an audible click should be heard when connecting the Driveline to the controller. Failure to use the Driveline Cover may cause an Electrical Fault Alarm.

TO DISCONNECT A DEPLETED BATTERY

- Make sure there is a fully charged battery available to replace the depleted one.
- Disconnect the depleted battery by turning the connector sleeve counterclockwise until it stops.
- Pull the connector straight out from the controller.

CONNECTING POWER TO CONTROLLER

To Connect a Charged Battery:

- Grasp the cable of the charged battery at the back end of the connector (leaving front end of connector free to rotate)
- Line up the solid white arrow on the connector with the white dot on the Controller.
- Gently push (but DO NOT twist) the battery cable into the Controller until it naturally locks into place; you should hear an audible click.
- Confirm that the battery cable is properly locked on the controller by gently pulling the cable near the controller power connector.
- **DO NOT force the battery cable into** the controller connector without correct alignment as it may result in damaged connectors .

Power Source Connection

HeartWare™ HVAD™ System Emergency Operation

STEPS TO EXCHANGE THE CONTROLLER

Exchange the controller when the controller display indicates [Change Controller]. Priority is to restart the pump quickly.

It may be helpful to remember the 4 P's:

1. **POWER...** Connect a power source to the new controller.

2. **PUMP...** Restart the pump by connecting the driveline to the new controller.

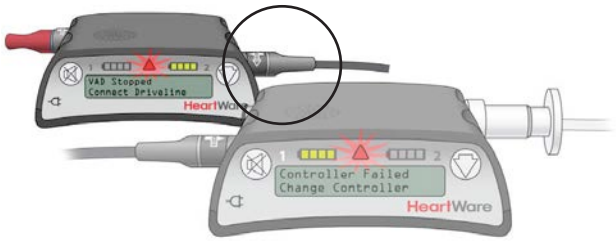
3. **PREVENT...** Prevent the [No Power] alarm on the original controller with the red alarm adapter or by pressing the Scroll and Mute buttons at the same time until a "beep" is heard, or for at least 5 seconds.

4. **POWER...** Connect a second power source to the new controller.

Step 1: Have patient sit or lie down and place the back-up controller within easy reach. The backup controller will become the new controller.

Step 2: Connect one **POWER** source to the new controller.

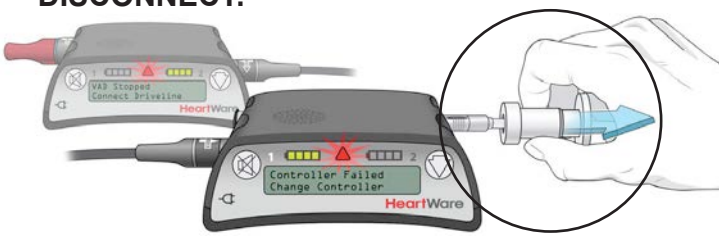
NOTE: The new controller may alarm after 10 seconds with a [VAD Stopped, Connect Driveline] high alarm. This is expected behavior.



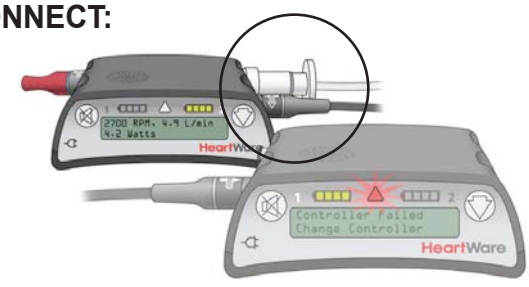
Step 3: Disconnect the driveline from the original controller and connect the driveline to the new controller. This should restart the **PUMP.**

• Verify that the pump is working. The RPM, L/min and Watts numbers should show on the Controller Display. If the pump does not restart, re-check driveline and power source connections, if it still doesn't start, call the patient's VAD team for assistance.

DISCONNECT:



CONNECT:



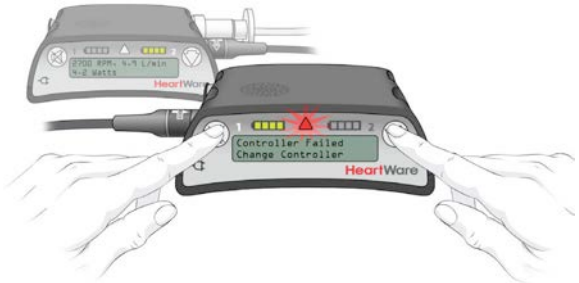
• If you have only connected 1 power source to the new controller, you will also have a [Power Disconnect, Reconnect Power] alarm.

HeartWare™ HVAD™ System Emergency Operation

Step 4: PREVENT the [No Power] alarm from sounding on the original controller. This needs to be done before removing all power. There are 2 options, see below:

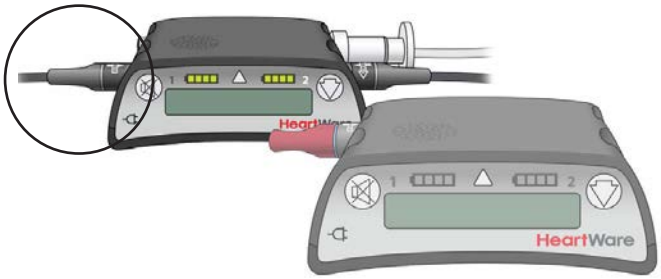
- If a red alarm adapter is available:
  - – Insert it into the connector data port on the original controller
  - – You can now remove all power from the original controller and no alarm should sound.

- If no red alarm adapter is available:
  - – Press and hold the “Alarm Mute” and “Scroll” buttons on the original controller until a “beep” is heard, or for at least 5 seconds.
  - – Release the “Alarm Mute” and “Scroll” buttons.
  - – You can now remove all power from the original controller and no alarm should sound.

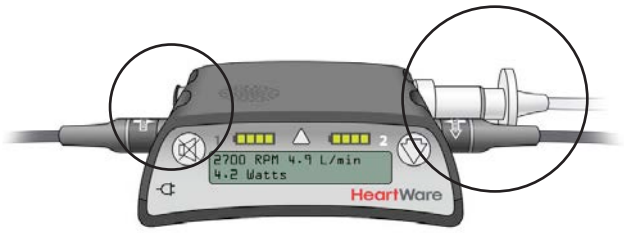


- If you removed power before silencing the [No Power] alarm, reconnect a power source and follow the steps above to silence it.

Step 5: Connect a second **POWER** source to the new controller.

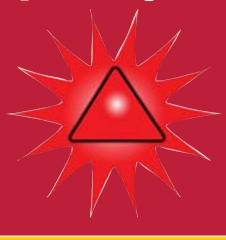
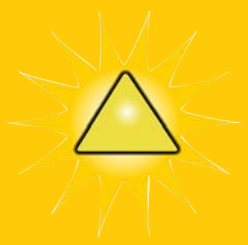


Step 6: Be sure the driveline cover is over the silver driveline connector and the data port is covered by the dust cap. If the red alarm adapter is connected to the controller that is now running the pump, remove it and close the cap on the data port.



Call the patients VAD team to obtain a new back-up controller.

HeartWare™ HVAD™ System Troubleshooting

Alarm Type	Alarm Display (Line 1)	Action (Line 2)
ALARM [No Power]	[no message]	[no message]
	When both power sources (2 batteries or 1 battery and an AC adapter or DC adapter) are removed. NO message will display on the controller. The [No Power] alarm will sound but the Alarm Indicator on the controller WILL NOT light. This indicates the pump has stopped. You should immediately connect two power sources.	
HIGH-CRITICAL [Flashing Red] 	[VAD Stopped]	[Connect Driveline]
	[VAD Stopped]	[Change Controller]
	[Critical Battery]	[Replace Battery 1]
	[Critical Battery]	[Replace Battery 2]
	[Controller Failed]	[Change Controller]
MEDIUM [Flashing Yellow] 	[Controller Fault]	[Call]
	[Controller Fault]	[Call: ALARMS OFF]
	[High Watts]	[Call]
	[Electrical Fault]	[Call]
	[Low Flow]	[Call]
	[Suction]	[Call]
LOW [Solid Yellow] 	[Low Battery 1]	[Replace Battery 1]
	[Low Battery 2]	[Replace Battery 2]
	[Power Disconnect]	[Reconnect Battery 1]
	[Power Disconnect]	[Reconnect Power 2]

[CALL] VAD team listed on the patient's contact sheet.

Jarvik 2000® Ventricular Assist System (VAS)

1. **Can I do external CPR?**
   Yes, in the right clinical scenario. Chest compressions may pose a risk of dislodgement - use clinical judgment. If compressions are administered, confirm function and positioning of the pump.

2. **Can the patient be defibrillated while connected to the device?**
   Yes, you can defibrillate, and you do not have to disconnect anything.

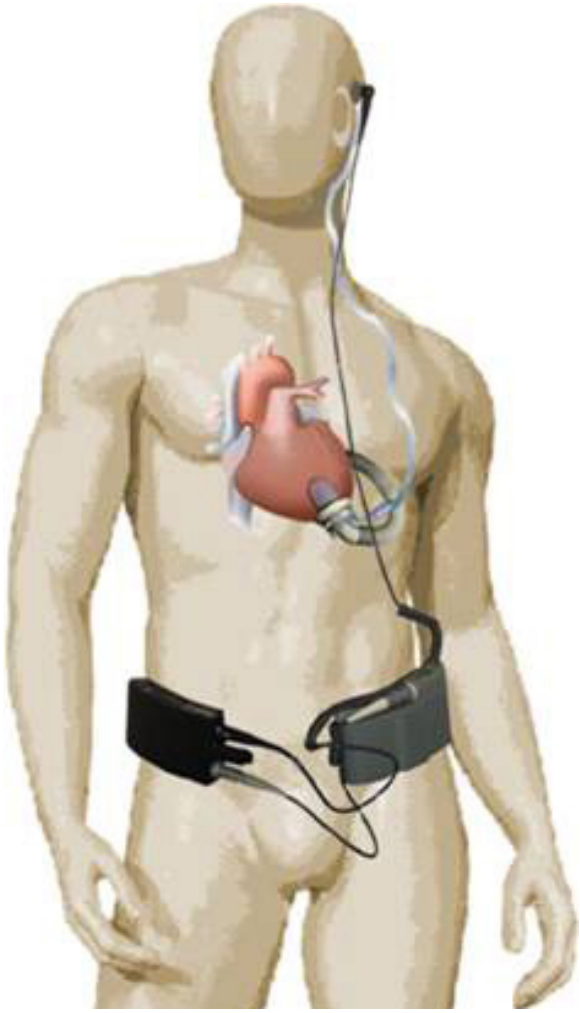
3. **Can this patient be externally paced?**
   Yes.

4. **What type of alarm occurs in a low flow state?**
   No alarm for low flow. If pump is off, the red “Pump Stop” symbol will light with a continuous alarm.

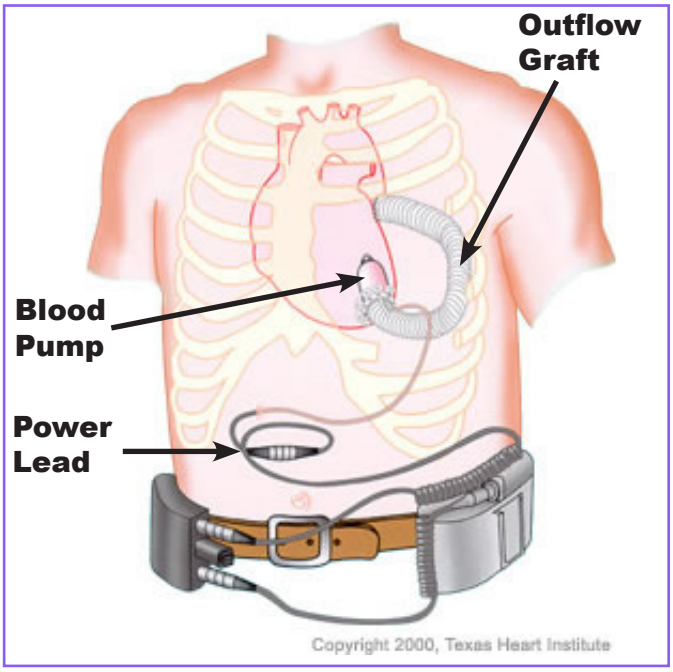
5. **Does the patient have a pulse with this device?**
   Most patients have a faint palpable pulse. If the controller is marked “ILS” (see below), the speed is automatically reduced every minute for 8 seconds & the patients pulse may increase during this time.

6. **Can I change the speed of the device?**
   There is a speed dial on the side of the controller (see picture on next page). Turning the dial in the direction of the arrow increases the speed. Each increment is 1,000 RPM. It is recommended not to change the speed without consulting the implanting center.

7. **What are acceptable vital sign parameters?**
   MAP 65 - 80mm Hg.

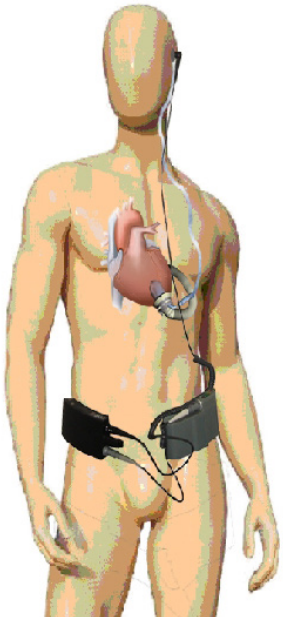


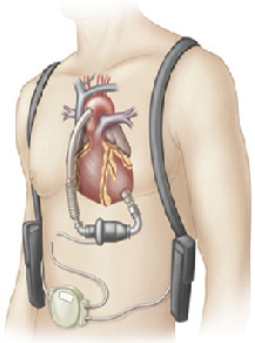
Jarvik 2000 with Post-Auricular exit site.



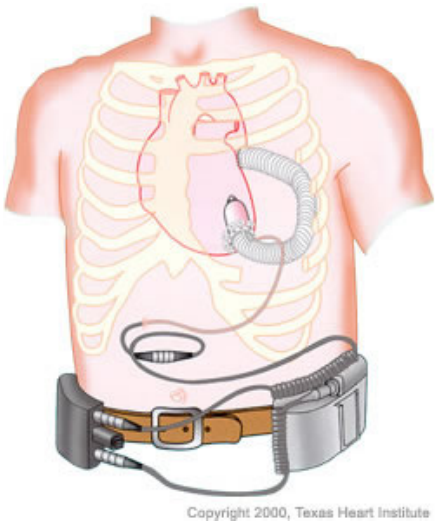
Jarvik 2000 with Abdominal exit site.

Jarvik 2000® VAS



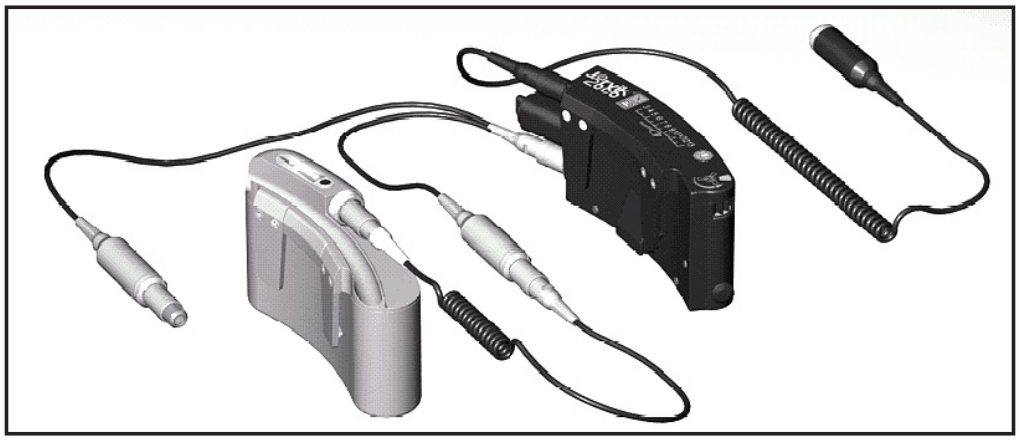


The Jarvik 2000® VAS is available in two models: the Jarvik 2000® VAS, Post-Auricular Cable (JHI-001) and the Jarvik 2000® VAS, Abdominal Cable (JHI-002). The main difference between the two models is the exit site of the drive cable. The drive cable of the Jarvik 2000® VAS, Abdominal Cable exits the abdomen and the drive cable of the Jarvik 2000® VAS, Post-Auricular Cable exits at a Pedestal surgically attached to the skull behind the ear.

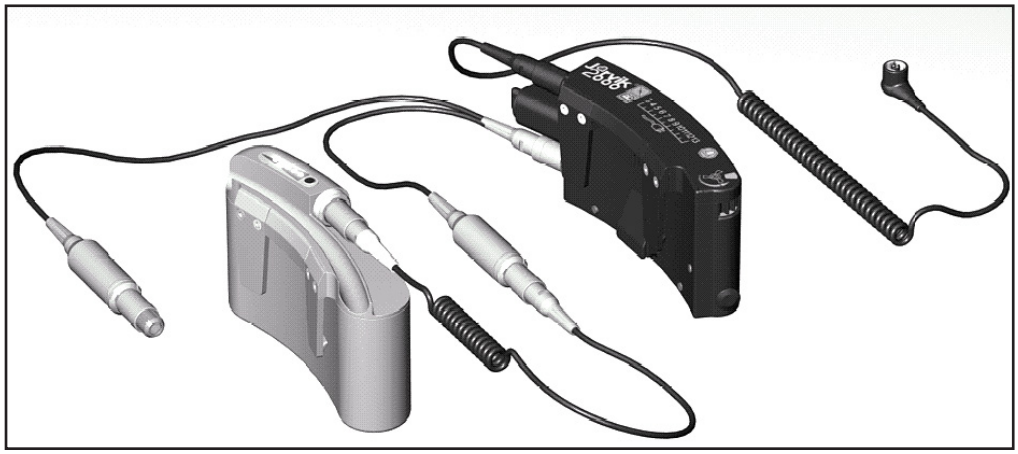


Jarvik 2000® VAS, Post-Auricular Cable.

Jarvik 2000® VAS, Abdominal Cable.



External Equipment for Jarvik 2000® VAS, Abdominal Cable.

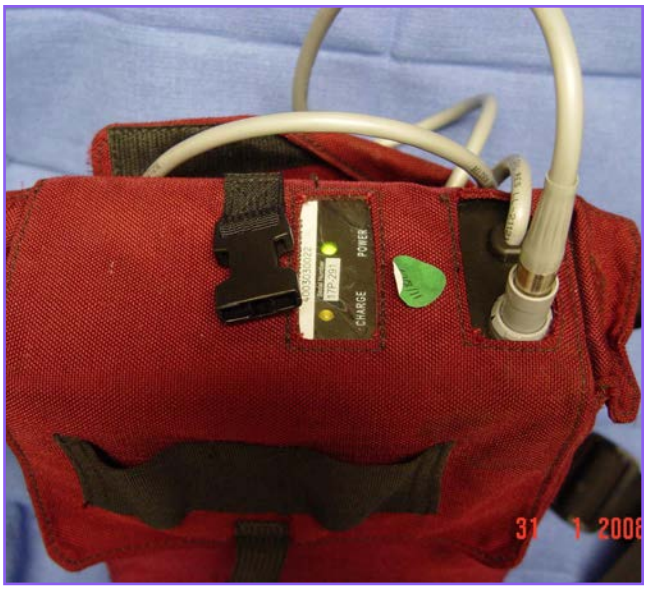


External Equipment for Jarvik 2000® VAS, Post-Auricular Cable.

NOTE: This Guide is NOT intended to replace the Operator Manual and Patient Handbook.

Jarvik 2000® VAS

Li-ion Battery.



Reserve Battery/Charger.

FlowMaker® Controller.

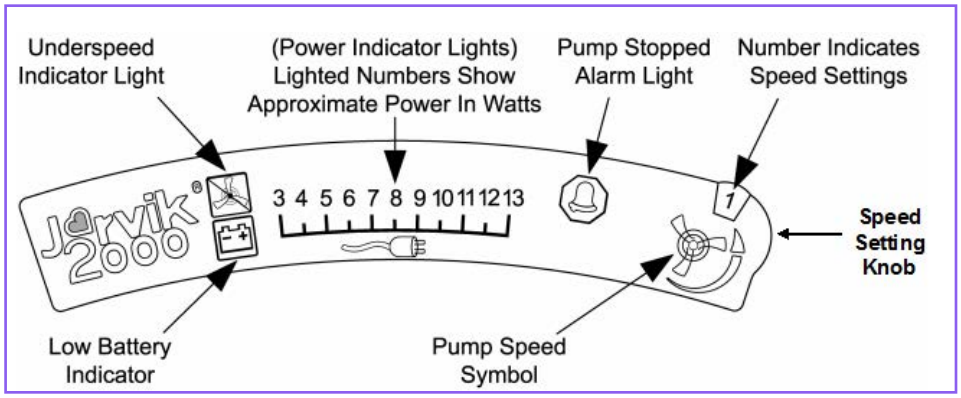


Diagram of FlowMaker® Controller Top Panel.

Dial Setting	Speed Rpm	Flow L/min	Power Watts
1	8,000	1-2	3-4
2	9,000	2-3	4-5
3	10,000	4-5	5-6-7
4	11,000	5-7	7-8-9
5	12,000	7-8.5	8-9-10

The FlowMaker Controller provides:
1. power to the implanted blood pump,
2. user settable speeds at which the pump runs, and
3. alarms and warnings.
The **FlowMaker®** Controller does not monitor the actual blood flow that the **Jarvik 2000® Ventricular Assist Device** (VAD) is pumping. In general, the higher the setting number the more blood the Jarvik 2000 VAD will pump. The tabulated flow estimates are based on research measurements in healthy animals. The actual blood flow may vary and will depend on several factors including blood pressure and the condition of the natural heart.

Jarvik HEART™

Jarvik 2000® VAS

Speed Setting, Alarms, and Warnings

Only one control adjustment to the **Jarvik 2000® VAD** can be made. The **Jarvik 2000® VAD speed** can be selected by turning the knob on the side of the **FlowMaker® Controller**. The setting number appears in the window on the top panel. The arrow indicates the direction to turn the knob to increase the speed.

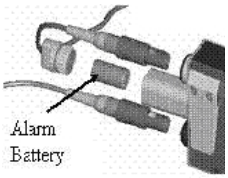
Power Indicator Lights The numbers indicate the electrical power (Watts) that the VAD is using. One, two, or three numbers may be lit at any moment, and the lights may change rhythmically with the heartbeat of the natural heart. A power measure of 13 watts or more indicates malfunction. The High Power Indicator, number 13, will light yellow. This condition should receive prompt medical attention.

When the battery powering the **Jarvik 2000® VAD** is low, the **Low Battery Alarm** on the **FlowMaker® Controller lights yellow** and the alarm sound beeps. Remaining running time with the portable Li-ion Battery is about 5-10 minutes.

If the **Jarvik 2000® VAD** stops or if the VAD speed drops to below 5,000 RPM for any reason, a steady alarm sound is heard and the **Pump Stopped Alarm** on the **FlowMaker® Controller lights red**. **The Pump Stopped Alarm** will also sound if the intermittent low speed featured on the ILS FlowMaker® Controller fails to function for any reason. Immediate attention is required. **Follow the Pump Stopped Alarm procedure for the appropriate Jarvik 2000® VAS model (Post-Auricular Cable or Abdominal Cable) which is included in this guide.**

The **Underspeed Indicator light will glow yellow** when the **Flowmaker® Controlle**r detects that the **Jarvik 2000 ® VAD** speed is slower than the dial setting selected. The most common reason is the battery voltage is too low.

In this case, corrective actions are to:
1 Select a lower speed setting on the **Flowmaker® Controller** and/or **2** Change the battery to a fully charged Li-ion Battery. If the underspeed indicator light is still lit, then the cause may be a fault in the system. Replace all external components; and if the underspeed light is still on after replacing all external components, treat the situation as an emergency and seek immediate medical attention. *See Patient Handbook and Operator Manual for more details.*



A non-rechargeable **Alarm Battery** is used to assure that the **FlowMaker Controlle**r has enough power for the alarms if the main battery fails, if the battery cable fails, or if the main battery becomes accidentally disconnected.

This **Alarm Battery** is located in a small housing on the end of the **FlowMaker® Controller** between the connectors for the cables. Be sure that the **Alarm Battery Cap** holding the Alarm Battery in place on the **FlowMaker® Controller** is screwed on finger tight whenever the **FlowMaker® Controlle**r is used. If the **Alarm Battery Cap** is not screwed finger tight in place, the backup power for the alarms will not function. Every time the **Alarm Battery Cap** is tightened, the Controller's back-up Alarm needs to be tested. With a caregiver present, briefly disconnect the main battery (Li-ion Battery or Reserve Battery/Charger) to be sure the Pump Stopped Alarm sounds. The disconnection should be brief and the main battery should be reconnected almost immediately. If the Pump Stopped Alarm does not sound, retighten the Alarm Battery Cap and repeat the test. Contact the implant center immediately if the alarm does not sound during this test.

Jarvik 2000® VAS

Procedure to Resolve Pump Stopped Alarm
Jarvik 2000® VAS, Post-Auricular Cable

The most likely reason for the **Jarvik® 2000 VAD** (pump) to stop is a completely **discharged battery** or a **disconnected** or **damaged cable.** If the cause of a component failure is clearly identifiable (i.e. low battery, physical damage, etc.) replace that cable or component **first.**
If the cause is unknown, follow these step-by-step instructions with the assistance of a support person. The patient should sit down or lie down. This procedure should be completed quickly. Back-up equipment must be immediately available.

1. Be sure the alarm is not an intermittent beeping which only indicates a low battery. If the alarm is beeping, change the battery as usual.

2. If the Jarvik 2000® VAD is stopped (steady alarm sounding, red light on):

   a. **Disconnect the Pedestal Cable from the Pedestal at the skull, and set aside all the attached components.** Disconnect the Li-ion Battery Cable and also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller to silence the alarm.

   b. Plug in a backup Pedestal Cable into the Pedestal and into a backup FlowMaker® Controller. Make sure the FlowMaker® Controller is set at speed setting 1. Make sure to tighten the Alarm Battery Cap on the backup FlowMaker® Controller to activate the alarm.

   c. Using the backup Li-ion Battery Cable, plug a fully charged Li-ion Battery into the FlowMaker® Controller.

   d. If the Jarvik 2000® VAD now runs, and the patient is feeling well, red tag the original components that were set aside in step 2a.

   e. Set the FlowMaker® Controller back at the speed the user was using prior to the alarm.

3. **If the Jarvik 2000 VAD (pump) is still stopped call the medical emergency number immediately.**

4. Red tag all components of the system that were set aside before changing to the backup components in step **2a.** This should be done with the assistance of a medical support person if possible.

5. It is possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.

6. If the Jarvik 2000® VAD still has not started, the patient should lie down and the support person should double check batteries and connectors. Try changing batteries again. It is possible that a discharged battery was removed and the same discharged battery was accidentally plugged back into the system. It is possible that neither battery is charged. If no lights illuminate on either battery, use a third battery. It is also possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.

7. If all of the above steps have been followed and all cables and components have been replaced without successfully restarting the Jarvik 2000® VAD, **disconnect the power to the Jarvik 2000® VAD by unplugging the battery.** Also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller. **(The alarm should stop sounding).** If the Li-ion Battery or Reserve Battery/Charger is not disconnected, the FlowMaker® Controller will apply power to the Jarvik 2000® VAD which could be harmful. Disconnecting the battery reduces the chance of a clot forming inside the Jarvik 2000® VAD by allowing the rotor to spin as blood flows across it.

Note: Return any failed or suspect component(s) to your Clinical Center for evaluation by Jarvik Heart, Inc.

Jarvik 2000® VAS

Procedure to Resolve Pump Stopped Alarm
Jarvik 2000® VAS, Abdominal Cable

The most likely reason for the **Jarvik 2000® VAD** (pump) to stop is a completely **discharged battery** or a **disconnected** or **damaged cable.** If the cause of a component failure is clearly identifiable (i.e. low battery, physical damage, etc.) replace that cable or component **first.**
If the cause is unknown, follow these step-by-step instructions with the assistance of a support person. The patient should sit down or lie down. This procedure should be completed quickly. Back-up equipment must be immediately available.

1. Be sure the alarm is not an intermittent beeping which only indicates a low battery. If the alarm is beeping, change the battery as usual.
2. If the Jarvik 2000® VAD is stopped (steady alarm sounding, red light on):

a. **Disconnect the Extension Cable from the drive cable at the abdomen, and set aside all the attached components.** Disconnect the Li-ion Battery Cable and also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller to silence the alarm.

b. Plug the drive cable (the cable exiting the skin at the abdomen) directly into the backup FlowMaker® Controller (eliminating the Extension Cable). Make sure the FlowMaker® Controller is set at speed setting 1. Make sure to tighten the Alarm Battery Cap on the backup FlowMaker® Controller to activate the alarm.

c. Using the backup Li-ion Battery Cable, plug a fully charged Li-ion Battery into the FlowMaker® Controller.

d. If the Jarvik 2000® VAD now runs and the patient is feeling well, red tag the original components that were set aside in step 2a.

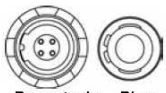
e. Set the FlowMaker® Controller back at the speed the user was using prior to the alarm.

3. **If the Jarvik 2000® VAD (pump) is still stopped call your medical emergency number immediately.**
4. Red tag all components of the system that were set aside before changing to the backup components in step **2a.**
5. Be sure that all external cables and connectors have been changed and check to see if the connector at the end of the drive cable exiting the skin at the abdomen is broken. If it is broken and has come apart – try to put it back together where it is broken. If the Jarvik 2000® VAD does not run, take the connector apart again – rotate the parts 90° and put the connector back together again. Repeat three times. The Jarvik 2000 VAD may start. The connector may then be held together with tape while the patient is transported to the hospital for it to be repaired.
6. It is possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.
7. If the Jarvik 2000® VAD still has not started, the patient should lie down and the support person should double check batteries and connectors. Try changing batteries again. It is possible that a discharged battery was removed and the same discharged battery was accidentally plugged back into the system. It is possible that neither battery is charged. If no lights illuminate on either battery, use a third battery. It is also possible that one of the connectors is not fully plugged in and is not making contact. Recheck all connectors.
8. If all of the above steps have been followed and all cables and components have been replaced without successfully restarting the Jarvik 2000® VAD, **disconnect the power to the Jarvik 2000 VAD by unplugging the battery.** Also partially unscrew the Alarm Battery Cap on the FlowMaker® Controller. **(The alarm should stop sounding).** If the Li-ion Battery or Reserve Battery/Charger is not disconnected, the FlowMaker® Controller will apply power to the Jarvik 2000® VAD which could be harmful. Disconnecting the battery reduces the chance of a clot forming inside the Jarvik 2000® VAD by allowing the rotor to spin as blood flows across it.

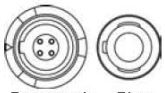
Note: Return any failed or suspect component(s) to your Clinical Center for evaluation by Jarvik Heart, Inc.

Jarvik® 2000

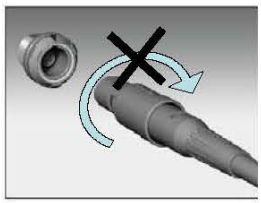
Jarvik 2000® Adult Ventricular Assist System—Quick Reference Guide



Connection from Jarvik 2000 VAD to FlowMaker Controller: The black receptacle on the FlowMaker Controller is located above the housing for the small back-up Alarm Battery. The receptacle has double key slots for a black plug. The Extension Cable and the Pedestal Cable (depending on the model of the device used) also have double key slots.



Connection from FlowMaker Controller to Y Cable or battery: The gray receptacle on the FlowMaker Controller is located below the housing for the small back-up Alarm Battery. This receptacle has a single key slot for the gray plug of the Y Cable, Li-ion Battery Cable, and Reserve Battery/Charger.



Note that the single and double keys on the plugs and receptacles are easily visible and must be placed in the proper rotational position, with the arrows on receptacle and plug lined up, for the connectors to go together. The connectors are attached and removed by a push-pull latch mechanism, not by a screw thread. Place the plug into the receptacle with slight pressure and gently rotate the plug until the key-way engages. Then push the connector together. The connector should click into place and should not come apart if the cable is tugged. To remove the plug, hold it close to the receptacle and pull.

- Never attempt to disconnect any connector by twisting.
- Do not attempt to pull the connector apart by the wire or by the strain relief.
- Never force a connector together. If the plug does not go into the receptacle easily, gently rotate it until it is aligned properly. When it is fully engaged, a soft click can be heard.
- If a connector is damaged or pins are bent, do not attempt to repair but replace the cable instead.

The **Y Cable** for the Jarvik 2000 VAS is used to allow battery changes without removing power from the Jarvik 2000 VAD. Before unplugging a discharged battery, a recharged battery should be plugged into the Y Cable. If the battery cable is unplugged prior to attaching a charged battery to the other end of the Y Cable, the Jarvik 2000 VAD stops, but the natural heart continues to beat. If this occurs, the beeping tone of the alarm will change to a steady tone, indicating that the Jarvik 2000 VAD is stopped. After the used battery is replaced with a fresh one, always remove the discharged battery from the Y Cable.

The portable **Li-ion Battery** will run the Jarvik 2000 VAS for 7-12 hours under usual conditions. The Li-ion Battery has an indicator with 5 lights that indicates how much power is remaining. Depress the black button to turn on the indicator lights:

Indicator	Approximate Remaining Time
All 5 LEDS lit	8-12 hours
4 LEDs lit	6-10 hours
3 LEDs lit	5-8 hours
2 LEDs lit	3-5 hours
1 LED lit	5 minutes - 2 hours

Li-ion Battery Charger

When the Li-ion Battery Charger is first connected to wall power, the green light next to the vertical green bar will turn on. The second light will simultaneously turn on green for approximately 1-3 seconds, followed by the startup sequence below:

- Flashing yellow for approximately 18-24 seconds
- Solid green for approximately 1-3 seconds
- Off

The Li-ion Battery Charger is not required to go through the startup sequence each time it is connected to a Li-ion Battery. It will only occur when wall power is first applied to the Li-ion Battery Charger.

Never connect the Li-ion Battery to the Li-ion Battery Charger while the second light is green. If a connection is made during this brief period of time, the Li-ion Battery will not charge.

When disconnecting the Li-ion Battery Charger from a fully charged Li-ion Battery, always wait for the second light to turn off before connecting another Li-ion Battery.

The **Reserve Battery/Charger** has both a battery and a charger built into a single unit; however, they are not electrically connected to each other.

Reserve Battery Use:

1. Unplug the gray cable from the battery charger and plug it into the gray connector of the Y cable or the FlowMaker Controller.
2. Unplug the black power cord from the Reserve Battery/Charger and the wall plug.
3. If the Reserve Battery/Charger is used for under 12 hours and then recharged, it will last for more than 1000 recharge cycles. If it is not recharged until it is fully discharged (>24 hrs capacity) and the low battery alarm sounds, it will last for fewer than 200 recharge cycles.
4. Use the Reserve Battery/Charger for less than 12 hours each night and recharge it each morning after switching to the Li-ion Battery.

Reserve Battery Use

Charging the Reserve Battery

Charging the Reserve Battery:

Disconnect the gray plug from the Y Cable or FlowMaker Controller and plug it into the gray receptacle on the Reserve Battery/Charger.

A yellow light next to the Charge label on the Reserve Battery/Charger will turn on to indicate charging. When the Reserve Battery/Charger is near fully charged, the yellow light will turn off and automatically start to safely slow charge the battery. Continue charging the battery after the yellow light goes out and whenever the battery is not in use.

The green light next to the Power label on the Reserve Battery only indicates that wall power is connected to the charger section of the unit. The green light does not indicate the Reserve Battery/Charger is fully charged.

The Reserve Battery/Charger is near fully charged only when the Charge light turns off and the gray cable is plugged into the gray receptacle on the unit.

If the gray cable is not plugged into the receptacle on the Reserve Battery/Charger while the unit is also plugged into the wall, the Reserve Battery/Charger will not charge.

It is not possible to run the Jarvik 2000 VAS from wall power even if the Reserve Battery/Charger is plugged into wall power. It is also not possible to charge the Reserve Battery/Charger while the same Reserve Battery/Charger is being used to run the Jarvik 2000 VAD. At all times, the Jarvik 2000 VAD is run only from battery power.

Patient Management For TAHs

1. Assess the patients airway and intervene per your protocol.

2. Auscultate heart sounds but you can usually hear them without a stethoscope. Since this is pulsatile you should hear two sounds if properly functioning.

3. Assess the device for device information and alarms located on the driver.

4. Intervene appropriately based on the type of alarm. See specific device alarm guide on the pages that follow.

5. Assess Vital Signs. REMEMBER THERE IS NO ECG. THE PATIENT IS ASYSTOLIC.

6. Start IV if indicated.

7. You should be able to get a systolic and diastolic blood pressure.

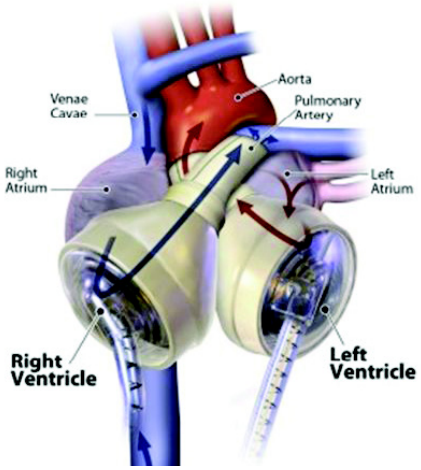
8. Call the VAD Center's 24 hour emergency number on the patient's contact list, controller/equipment, or emergency bag for assistance in the management of the patient and transportation determination and location.

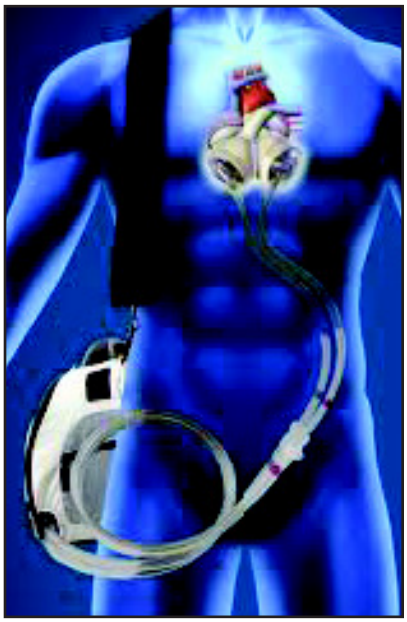
9. **Bring all of the patients equipment.**

10. **Bring the significant other if possible to act as a expert on the device in the absence of consciousness in the patient.**

Total Artificial Heart Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART
(not a left ventricular assist device-LVAD)



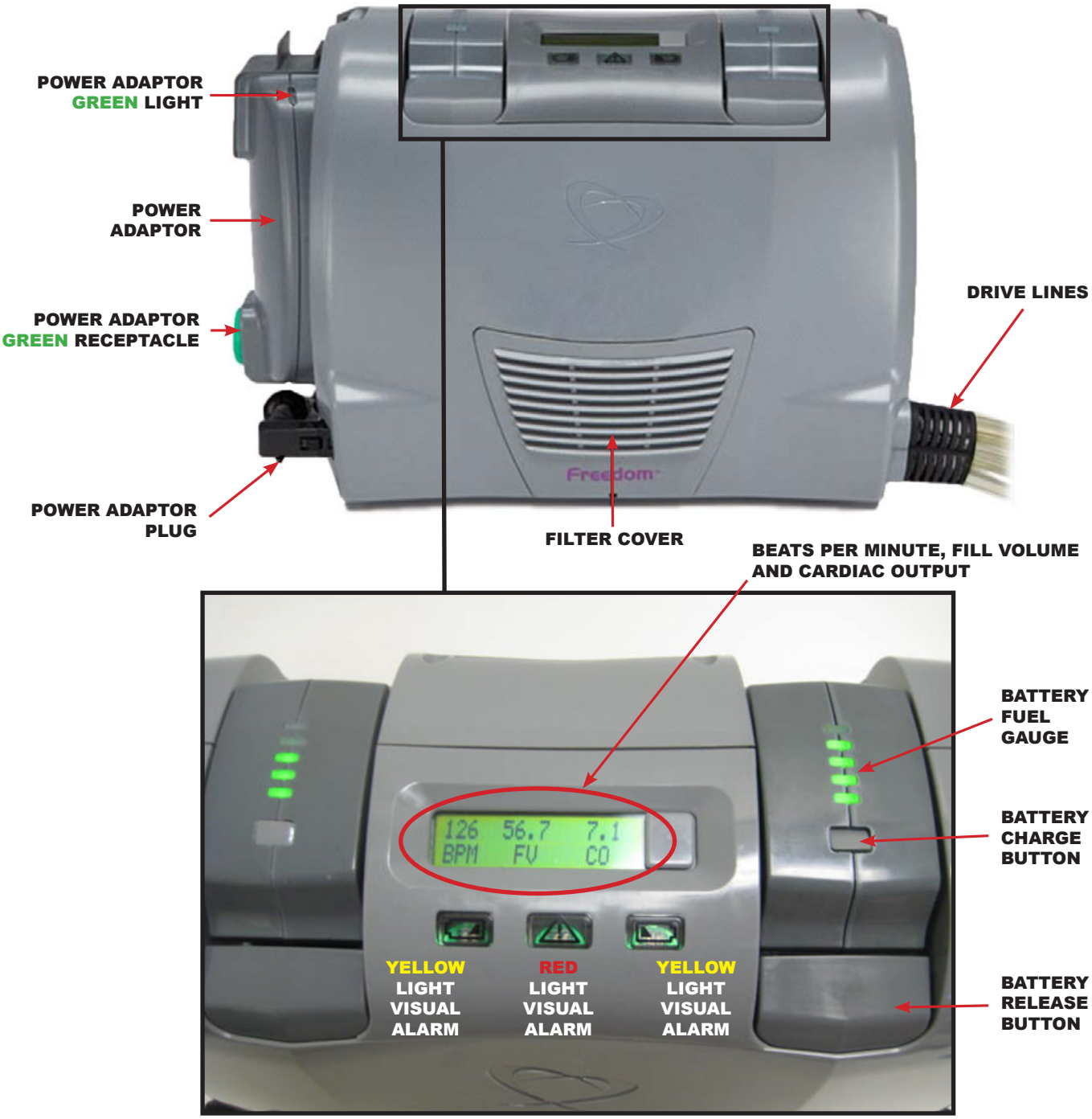


1. **Can I do CPR?**
   No. Will need to rapidly exchange to the backup driver.
2. **Can the patient be defibrillated or externally paced?**
   No, there is no native heart rhythm.
3. **Does the patient have a pulse with this device?**
   Yes. The device produces pulsatile flow. The device is pneumatically driven and is normally loud.
4. **What are acceptable vital sign parameters?**
   The BP will vary. Normal range 100-130 systolic and 60-90 diastolic.
5. **What kind of cardiac rhythm will be displayed on a monitor?**
   Asystole.
6. **Is there a "hand pump".**
   No. The priority is to secure connections to the Freedom Driver to ensure gas delivery.
7. **Can I give vasopressor IV drugs like epinephrine, dopamine or dobutamine?**
   Never give vasopressor drugs, especially epinephrine. Most IV vasopressor drugs can be fatal to a TAH patient. IV fluids are usually not required and may be unhelpful if the patient is already fluid overloaded. These patients primarily have symptomatic hypertension and rarely have symptoms of hypotension.
8. **How can symptomatic hypertension be treated?**
   Sublingual nitroglycerin.
9. **Can I speed up the rate of the device?**
   No. The device has a fixed rate between 120-140 BPM
10. **What if the patient is symptomatic and the Freedom Driver is alarming with a continuous alarm and the red light?**
    If the pump has failed or a line is disconnected or kinked, the patient may pass out within 30 seconds. Even with alarming, the device will continue to pump. Confirm the drivelines are connected and are not damaged or kinked. If the patient is conscious and can participate, assist the patient to immediately change out the Freedom Driver.

Trouble Shooting Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART

(not a left ventricular assist device -LVAD)



Freedom™ Driver System

IN THE EVENT OF AN EMERGENCY

Immediately notify VAD coordinator listed on the medical alert bracelet or tag attached to the console - please identify the device as a total artificial heart.

HOW TO RESPOND TO FREEDOM™ DRIVER ALARMS

There is no way to mute an Alarm.

ALARM	HEAR	SEE	MEANING	WHAT YOU SHOULD DO
Battery Alarm	Loud Intermittent Tone	Yellow Battery LED Flashing	One or both of the Onboard Batteries have less than 35% remaining charge (only two green lights display on the Battery Fuel Gauge).	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power (NOTE: Once the batteries are charged above 35% the Battery Alarm will stop) .
			Onboard Battery is incorrectly installed.	Reinsert Onboard Battery until locked in place. If Battery Alarm continues, insert a new Onboard Battery.
			One Onboard Battery missing.	Insert charged Onboard Battery into Freedom™ Driver until locked in place.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The temperature of the Driver is too hot or too cold.	Remove any objects that are blocking the Filter Cover and/or Fan and check the filter.
			The internal temperature of the Driver is too hot.	Move the Freedom Driver to a cooler or warmer area.
Fault Alarm	Loud Continuous Tone	Red Alarm LED Solid	Valsalva Maneuver: Strenuous coughing or laughing, vomiting, straining during a bowel movement, or lifting a heavy weight.	Relax/interrupt Valsalva Maneuver.
			Kinked or disconnected drive lines.	Straighten or connect drive lines.
			Driver is connected to External Power without at least one correctly inserted Onboard Battery.	Insert a charged Onboard Battery into the Freedom™ Driver until locked into place.
			One or both of the Onboard Batteries have less than 30% remaining charge.	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power. (NOTE: the Fault Alarm will continue and will change into a Battery Alarm as the Onboard Batteries recharge. Once the Onboard Batteries are charged above 35%, the Battery Alarm will stop.)
			Malfunction of the Driver	If the steps above do not stop the Fault Alarm, switch to Backup Freedom Driver. Return to implant hospital.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The internal temperature of the Driver is too hot.	Remove any objects that are blocking the Filter Cover and / or Fan and check filter.
			The temperature of the Onboard Batteries is too hot or too cold.	Move the Freedom Driver to a cooler or warmer area.

You must immediately address the issue that caused the Alarm.

Switching from Primary to Backup Freedom™ Driver

CAUTION: It is recommended to have TWO people exchange the primary Freedom Driver for the backup Freedom Driver. Make sure all items and accessories are closely available before attempting to exchange Drivers.

Setting up the Backup Freedom™ Driver

1. Remove the drive line caps from the ends of the Drive lines.
2. Insert one charged Onboard Battery. The driver will immediately start pumping. (*Figure 1*)
3. Remove the Orange Dummy Battery. (*Figure 1*)
4. Insert the second charged Onboard Battery. (*Figure 2*)
5. If possible, connect the backup Driver into a wall power outlet.
6. Your Freedom™ Driver is now ready to connect to the patient.

FIGURE 1

FIGURE 2

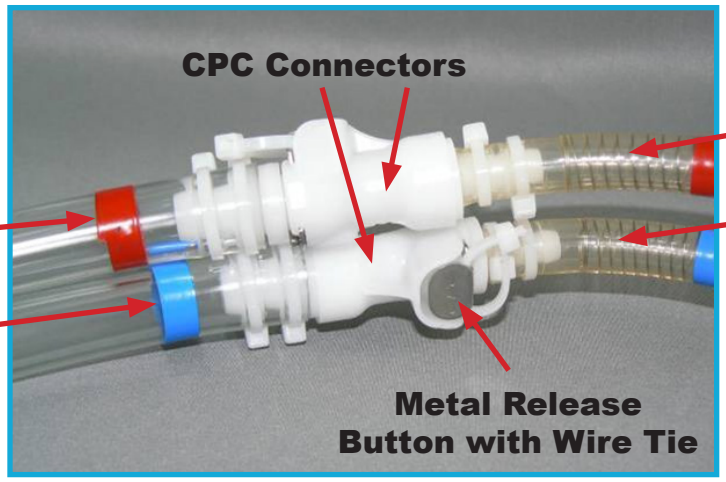
BEATS PER MINUTE, FILL VOLUME AND CARDIAC OUTPUT

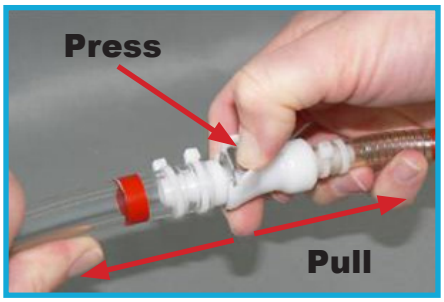
FIGURE 3

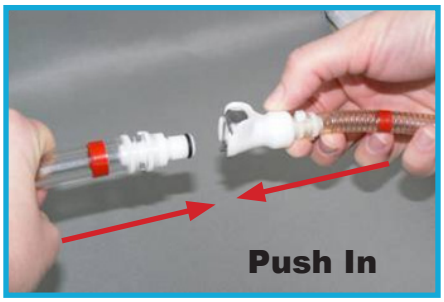
Continued on next page.

Switching from Primary to Backup Freedom™ Driver

Continued on from previous page







1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the RED TAH-t Cannula to the RED Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

2. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the BLUE TAH-t Cannula to the BLUE Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

CAUTION: Before disconnecting the Drive lines of the primary Freedom Driver, you must have the Drive lines of the backup Freedom Driver within reach. The backup Driver must be turned on. Perform steps 3 and 4 simultaneously.

3. Disconnect the RED Cannula from the RED Drive line of the primary Freedom Driver:
- Simultaneously Press and hold down the metal release button. Pull the RED Cannula away from the RED Drive line.
- Immediately insert the RED Cannula into the new RED Drive line from the backup Freedom Drive Insert until a click is heard and lightly tug on the connection to make sure that it is secure.

4. Simultaneously disconnect the BLUE Cannula from the BLUE Drive line of the primary Freedom Driver:
- Press and hold down the metal release button. Pull the BLUE Cannula away from the BLUE Drive line.
- Immediately insert the BLUE Cannula into the new BLUE Drive line from the backup Freedom Driver.
- Insert until a click is heard and lightly tug on the connection to make sure that it is secure.

5. Slide a Wire Tie under the metal release button of each CPC connector. Create a loose loop in the tie, taking care not to depress and disconnect the connectors. Cut off the excess length of both Wire Ties.

6. Patient must notify Hospital Contact Person of the switch.

7. The Hospital should notify SynCardia Systems that the Driver has been switched and return the faulty Driver.