Pre-Hospital Advanced Life Support
Patient Care Protocols and Procedures

Walla Walla and Columbia Counties
Emergency Medical Services

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General Expectations

Indication

General approach to patient care and safety of EMS providers in Columbia and Walla Walla Counties.

Safety

1. Provider safety is our priority, and the responsibility of all EMS providers operating in Columbia and Walla Walla Counties to ensure the safety of ourselves and our crew members.
2. If the scene is not secure responders shall contact law enforcement. Responders shall not expose themselves to the scene until it is determined **SAFE AND SECURE.**
3. If the scene becomes unsafe after arrival, units shall discretely contact dispatch for help by utilizing code 10-99. For example: "M3921 to Dispatch, 10-99".
4. Personal protective equipment shall we worn when indicated on all EMS incidents where exposure to high-risk infectious environments is likely.

Patient Care

1. Perform patient assessment with emphasis on the airway, breathing, and circulation.
2. Monitor and document vital signs, including pulse oximetry as appropriate. Monitor ETCO2 for all patients with an advanced airway, respiratory compromise, or with profound altered mental status. Objectify variability in trending vital signs and overall patient status.
3. Obtain SAMPLE history and other pertinent information to the patients' condition.
4. Routine oxygen administration on patients without respiratory distress is not a good practice. Supplemental oxygen should only be applied to keep **oxygen saturation >94%.**
5. All Paramedics operating in Columbia and Walla Walla Counties shall have adequate knowledge of the medications and procedures authorized by the Medical Program Director's. Protocol testing is mandatory prior to county certification to operate as a lead provider.
6. These protocols serve as a starting point for patient care; unique situations encountered in the field are often not supported by a specific protocol. Remember patient and provider safety in every case and make decisions with sound clinical judgment.

Documentation

1. All patient care shall be documented according to agency-specific standard operating guidelines.
2. Documentation shall include all pertinent information to the treatment of the patient and any extenuating circumstances where documentation is necessary for future reference.
3. Medical necessity shall be thoroughly documented to justify the need for transport by ambulance and what specific factors indicated the ALS interventions performed.
4. Patient refusals shall be documented to thoroughly illustrate the patient's condition and the steps taken by EMS providers to educate and inform the patient of the severity of their condition and the necessity of evaluation and/or transport. Document all actions and conversations as they occurred chronologically and use quotations if necessary.
5. Patient care reports are considered stand-alone legal documents and must include the lead provider's first and last name, credentials, and date.

Treatment Rights / Refusals

Indication

This protocol is intended for use when treatment or transport is refused by a patient.

Treatment Rights

It is necessary to obtain patient consent before rendering emergency medical care. Expressed/informed consent must be received from competent adult patients. Implied consent is assumed in the case of life-threatening injury or illness when the patient is unconscious, disoriented, a mentally incompetent adult, or a minor whose parent or legal guardian is unavailable.

A competent adult has the right to refuse treatment.

Refusals

Competent Refusal

- EMS may obtain a competent refusal from a patient who is alert, oriented, and understands the explained risks and benefits. Patient or their representative must sign a refusal form.
- For minors, refusals should be completed by the minor's parent or guardian.

Incompetent Refusal

- An individual will be considered incompetent to refuse treatment by the assessing EMS provider when a medical condition/illness, injury, drugs, or alcohol has impaired the patient's judgment. The incompetent patient should be treated and transported if there is any potential serious threat to life or limb.

Involuntary Transport

- When a patient is deemed to need transport against his/her will, such as, suicidal, homicidal, or non-emancipated minor patients. Responding personnel will decided if this can be done without Law Enforcement assistance.
- If Law Enforcement is unable to assist and EMS personnel are unable to safely convince the patient to be treated or transported, Medical Control will be contacted, and patient will be left at the scene.
- At no time are EMS personnel to put themselves in danger by attempting to treat or transport a combative or threatening patient that refuses care.

Patient Left at Scene

- Refer to **Patients Released at Scene** protocol.

Private Vehicle or Police Transport

- EMS may allow the patient to seek further medical care via other means of transportation (private vehicle or Law Enforcement) if, in the providers judgement the patient is stable.

Documentation Considerations

Thorough documentation of all patient refusals is required. Documentation should include, but is not limited to the following:

- Quotes indicating statements made by the patient or responsible party that support their expressed understanding of your instructions and potential consequences of refusing care against medical advice.
- If the patient refused to sign the refusal form.
- Who, if anyone, that patient was left in care of.
- If Medical Control was contacted, who providers spoke with, and any guidance received.

Patients Released at Scene

Indication

This protocol is intended for use when a patient does not desire transport to the emergency department for evaluation and after an assessment and/or treatment by EMS personnel, **does not** have an ongoing emergent medical condition, a high-risk presentation (i.e., extremes of age ≤12 months or ≥70 years old, abnormal vital signs, chest pain, shortness of breath, abdominal pain, gastrointestinal or vaginal bleeding, etc.), or social risk factors and is released at scene to follow-up with the patient's regular healthcare provider or a doctor's office or clinic.

Considerations

1. EMS personnel shall assess the patient for an ongoing emergency medical condition, high-risk presentations, social risk factors, and assess that the patient or their legal representative has the capacity to decline transport.

2. Patients with an ongoing emergency medical condition, high-risk presentation, or social risk factors who do not desire transport to the emergency department shall be handled as refusing transport against medical advice.

3. Patients should be instructed by EMS to follow-up with the patient's medical home or primary care physician. The advice given should be documented on the PCR. The following statement is recommended: "After our assessment, you feel that you do not wish to be transported and you do not require immediate care in the emergency department. You should seek care with your regular healthcare provider or a doctor's office or clinic within 24 hours. If you have worsening or persistent symptoms or change your mind and desire transport, re-contact 911".

4. If the patient or the patient's legal representative requests that the patient be transported after assurances that transport is not needed; EMS personnel shall honor the requests and transport to the appropriate receiving facility.

Documentation Considerations

Thorough documentation of all patients released at scene is required. Documentation should include, but is not limited to the following:

- Patient history, assessment, field interventions or treatment.
- Assessment by EMS that the patient or legal representative is alert and has the capacity to make collaborative decisions with EMS to accept on-scene treatment, understand the need to have capacity for appropriate follow-up, but decline transport.
- Plan for follow-up care with primary healthcare provider or a doctor's office or clinic.
- Quotes indicating statements made by the patient or responsible party that support their expressed understanding of your instructions.
- Who, if anyone, that patient was left in care of.
- Instructions on contacting 911 if they have new, worsening, or persistent symptoms.
- If Medical Control was contacted, who providers spoke with, and any guidance received.

Transport to Alternate Destinations

Indication

EMS personnel may transport patients in crisis to alternate destinations instead of hospital emergency departments in accordance with RCW 70.168.170. These alternate centers must be capable and willing to accept pre-hospital transports.

Management

Intervention Sequence

Perform assessment
Obtain a detailed patient history
Ensure the patient falls under the inclusion criteria

Inclusion Criteria: Contact Medical Control as needed	**Vital Signs** (within normal range)
Age: 18-55	Heart Rate: 50-110
Voluntary/willing to go to alternative destination	SBP: 100-190
Cooperative and non-combative	DBP: <110
Normal level of consciousness	Respiratory Rate: 12-24
No serious chronic medical conditions	SPO2: >92%
Not taking medications that require laboratory monitoring	Temperature: 97-100.3 F
Has the ability to care for their self	Blood Glucose: 70-300

Exclusion Criteria: If any of the criteria below are present, the patient shall not be transported to an alternate destination and shall be transported to an appropriate emergency department.
New onset of mental illness
Overdose in the last 12 hours
Trauma requiring more than bandaging
Loss of consciousness or seizure in the last 24 hours
Pregnancy
Evidence of acute medical or traumatic problem
Current withdrawal from drugs or alcohol

Transport Considerations

Position of comfort is most appropriate

Special Considerations

Contact the intended facility early to determine if the facility can accept the patient. If the intended facility cannot accept the patient, transport them to the nearest appropriate emergency department.

Documentation Considerations

Thoroughly document patient history and vital signs (pulse, BP, respirations, pulse oximetry, skin conditions), Medical Control or alternate destination orders.

ALS Pharmacology

Indication

Approved ALS medications for EMS in Columbia and Walla Walla Counties. Medications on this list, as well as dosage forms (found in Appendix A) may be substituted for alternatives with written approval from the Medical Program Director to help with shortages and backorders.

Approved for Use

Acetylsalicylic Acid (Aspirin/ASA)
Adenosine (Adenocard)
Albuterol Sulfate (Ventolin, Proventil)
Amiodarone (Cordarone)
Atropine Sulfate
Dextrose 10% or 50% Injection
Diltiazem (Cardizem)
Diphenhydramine (Benadryl)
Epinephrine 1:1000 Injection (Adrenalin)
Epinephrine 1:10,000 Injection (Adrenalin)
Epinephrine 1:100,000 Injection (Push Dose Epi-Adrenalin)
Fentanyl Citrate (Sublimaze)
Glucose Gel (oral solution)
Ipratropium Bromide (Atrovent)
Ketamine (Ketalar)
Labetalol (Normodyne, Trandate
Lidocaine 2% Injection (Xylocaine)
Lorazepam (Ativan)
Magnesium Sulfate
Midazolam (Versed)
Naloxone (Narcan)
Nitroglycerine (Nitrostat)
Norepinephrine Bitartrate (Levophed)
Ondansetron (Zofran)
Oxygen (O2)
Oxytocin (Pitocin)
Rocuronium (Zemuron)
Sodium Chloride 0.9% (Normal Saline)
Succinylcholine (Anectine, Quelicin)
Tranexamic Acid (TXA)

Optional Medications

Individual agencies may carry at their discretion if determined to be cost effective and a positive benefit to the jurisdiction; consider geographic response area, average response and transport times, and mutual aid capabilities.

Acetaminophen (Tylenol)
Activated Charcoal (ACTi dose/ Sorbitol)
Calcium 10% Injection (Gluconate/Chloride)
Diazepam (Valium)
Etomidate (Amidate)
Glucagon (Gluca-Gen)
Haloperidol Lactate (Haldol)
Lactated Ringers (Alternative to NaCl)
Methylprednisolone (Solu-Medrol)
Nitrous Oxide (N2O, Nitro-NOx)
Sodium Bicarbonate (NaHCO3)

Glasgow Coma Scale

Indication

GCS scale should be calculated and documented for any patient with decreased LOC.

Management

Assessment

1. Eye opening
2. Best verbal response
3. Best motor response

Add the scores from each category. For example: if the patient opens their eyes to painful stimuli (2), their best verbal response is slurred or muffled, or incomprehensible words (2), and their best motor response is flexion or withdrawal from pain (4). The patient's Glasgow Coma Scale will be the total of all three categories; in this case the patient's GCS is 8.

Remember: GCS score is subjective and may vary depending on the provider doing the assessment, utilize GCS score as a tool to consider when making decisions and documenting a justification for interventions; however, do not rely solely on or base all decisions of care on this guide.

GLASGOW COMA SCALE

ADULT

	1	2	3	4	5	6
E – EYE RESPONSE	No response	Eyes open to painful stimuli	Eyes open to verbal stimuli	Spontaneous		
V – BEST VERBAL RESPONSE	No response	Incomprehensible sounds	Inappropriate words	Confused	Oriented to person, place and time	
M – BEST MOTOR RESPONSE	No response	Abnormal extension (Decerebrate)	Abnormal flexion (Decorticate)	Flexion withdrawal from pain	Moves and localizes to pain	Obeys commands

PEDIATRIC

	1	2	3	4	5	6
E – EYE RESPONSE	No response	Eyes open to painful stimuli	Eyes open to verbal stimuli	Spontaneous		
V – BEST VERBAL RESPONSE (<2 years)	No response	Grunts, agitated, restless	Inconsistently inconsolable	Cries but consolable	Smiles, follows objects, interacts	
V – BEST VERBAL RESPONSE (2-5 years)	No response	Grunts	Persistent cries and screams	Inappropriate words	Appropriate word use	
M – BEST MOTOR RESPONSE	No response	Abnormal extension (Decerebrate)	Abnormal flexion (Decorticate)	Flexion withdrawal from pain	Withdraws from being touched	Infant moves spontaneously or purposefully

Documentation

Reassess the patient's score frequently; record each observation, the time it was made, utilize multiple recordings of GCS scores to show overall patient improvement or deterioration throughout patient care.

General Pain Management / Anxiolysis / Sedation

Indication

To reduce pain and improve patient comfort. Patients compensate more efficiently for acute illness and injury when symptoms of pain and its associated anxiety are relieved.

Management

Assessment

Onset, Provocation, Quality, Radiation, Severity, Time (OPQRST)
Consider 1-10 Numeric Pain Scale and acute vs. chronic pain
Elevated vital signs, tearing, sweating, shaking, difficulty relaxing
Utilize various positioning strategies for patient comfort

Analgesia

Nitrous Oxide

Adult / Pediatrics: Self-administered by the patient until pain is relieved, or patient drops the mask. Consider using Nitrous as a bridge to narcotic administration. Fast and non-invasive administration of is often preferred for pediatric pain management over narcotics.

Fentanyl 0.5-1mcg/kg, up to 3mcg/kg then contact Medical Control
Patients over 70 years old may be given up to 50mcg every 10-15 minutes. If more is needed contact receiving hospital. If no IV is available 2mcg/kg may be given intranasal route
Pediatrics: 1 mcg/kg, contact Medical Control for further dosage
If no vascular access 2 mcg/kg may be given intra-nasal route

Fentanyl Infusion, consider Fentanyl infusion instead of multiple IV push doses for:

- Long Transport Times (>20 minutes, IFT, remote location, etc.)
- Ongoing moderate to severe pain (acute)
- Intubated patients requiring long-acting analgesia/sedation

Adult and Pediatric: 0.5-1 mcg/kg/hr, titrate for desired pain control/sedation, may increase infusion by 1mcg/kg/hr as needed, to a max of 3mcg/kg/hr, not to exceed 300mcg/hr.
Administration: Infuse with micro-drop (60gtt) IV tubing, refer to **Continuous Infusions** protocol; or utilize IV pump if available; mix 250mcg of Fentanyl in 250ml NS = 1mcg/ml.

Sedation / Anxiolysis

Consider benzodiazepine adjunct to aid with pain control by achieving additional desired effects: anxiolysis, sedation, amnesia, terminating muscle spasms, and preventing emergence reaction.

Lorazepam 1-2mg
Pediatrics: 0.05-0.1mg/kg

Midazolam 1-5mg
Pediatrics: 0.05-0.1mg/kg

Special Considerations

All medications have side effects. Consider patient history and factors that may contraindicate healthy adult doses of analgesics and sedatives: patient age, renal or hepatic disease, metabolic clearance capabilities, known allergy, opioid intolerance or sensitivity, and respiratory status.

Pain Management in Severe Trauma

Indication

Patients with severe pain due to trauma; traditional pain control therapies under the **General Pain Management** protocol are ineffective; trauma patients with hemodynamic instability.

Ketamine use in Trauma

Studies indicate a need for less narcotic analgesia (Fentanyl dosing in trauma patients receiving a dose of Ketamine in addition to narcotics).

Consider Ketamine for pain control for the following:

Entangled patients/major soft tissue injuries (machinery, vehicle, etc.)

Traumatic extremity amputation

Severe burns

Multi-system trauma (numerous long bone fractures, pelvic fractures, etc.)

Paramedic's clinical judgement of benefit to the patient

Contraindications for this protocol:

Chronic pain with exacerbation

Patient reporting severe pain without supporting exam findings

Known Ketamine allergy or hypersensitivity

Patient age <1 year

Management

Intervention Sequence:

Confirm patient is a candidate for dissociative Ketamine dosing.

Obtain medical history PRIOR to administration if possible.

Elevate head of stretcher

Continuous SPO2 and ETCO2 (cannula with oxygen preferred).

Pharmacology

Ketamine

Adjunct to narcotic agent (Fentanyl): **0.2mg/kg IV/IO/IM/IN** (sub-dissociative dose), may repeat dose q20 minutes for prolonged transport times, maximum total dose of **0.6mg/kg**. If more is needed or if Fentanyl is contraindicated, contact Medical Control for guidance.

Full-Dissociative Dosing (Induction dose): **1-2mg/kg IV/IO/IM/IN** for severe/extreme cases; trauma patients who, in the provider's clinical judgment, will not be adequately pain controlled with sub-dissociative Ketamine.

Pediatrics: >1 year old: 1mg/kg IV/IO/IN or 4 mg/kg IM.

Special Considerations

Emergence Reactions: Patients may experience agitation, crying, hallucinations, vivid dreams or altered perceptions when Ketamine is wearing off. Treat emergence symptoms with a repeat dose of Ketamine or **Midazolam** **2-5mg** or **Lorazepam** **1-4mg**. Laryngospasm may also occur and can be corrected with Larson maneuver; be prepared to suction secretions and assist ventilations.17

Chest Pain / Suspected Myocardial Ischemia

Indication

Chest pain secondary to suspected cardiovascular ischemia. Signs and symptoms include sudden onset of chest pressure, feeling of fullness or squeezing, anxiety or irritability, shortness of breath, weakness, dizziness, syncope, and nausea and vomiting.

Suspect atypical presentation in elderly women, diabetics, and morbidly obese. Patients may have silent MI's, presenting with vague signs and symptoms such as generalized weakness or abdominal discomfort.

Management

Assessment

Onset, Provocation, Quality, Radiation, Severity, Time (OPQRST)
1-10 Numeric Pain Scale (NPS) to establish baseline and pain relief with treatments.
Consider non-cardiac causes such as pleurisy, costochondritis, pneumonia, pulmonary embolism, musculoskeletal strain, anxiety, and other conditions manifesting as chest pain.

Intervention Sequence

Support ABC's, oxygen for SPO2 <94%
Establish IV access, consider a second line
Explain to patient that a normal 12 lead does not rule out ACS
Explain the need for further evaluation and enzyme level test
Anticipate cardiac arrest when STEMI is present, place defibrillation patches

Transport Considerations

Scene time should be no more than 10-15 minutes whenever possible
Consider need for PCI, refer to **Washington State Cardiac Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.2**, **Columbia County Operating Procedure #5.2**, or **Walla Walla County Operating Procedure #5.2**
Notify receiving facility without delay if STEMI is present
Transmit ECG (12 lead) to receiving facility if capable
Document full interpretation of ECG in PCR

Pharmacology

Aspirin **324mg PO** (4 baby Aspirin chewed)
Aspirin is relatively safe in most patients but contraindicated in patients with an ongoing GI bleed or bleeding ulcer, history of asthma or known hypersensitivity or allergy.

Nitroglycerin **0.4mg SL Tab or Spray** every 5-10 minutes up to 3 doses (1.2mg)
Nitroglycerin SL is contraindicated if SBP <90 mmHg

Fentanyl **25mcg increments** for persistent chest pain unrelieved after max dose of NTG (1.2mg) or if NTG contraindicated, repeat as needed until adequate pain relief up to 3mcg/kg, monitor blood pressure; discontinue if hypotension develops, administer appropriate fluid resuscitation as indicated by patient condition.

12 Lead ECG

Indication

Chest pain of unknown origin, suspected stroke, any medical pathology in which 12 lead ECG interpretations may be beneficial to differential diagnosis.

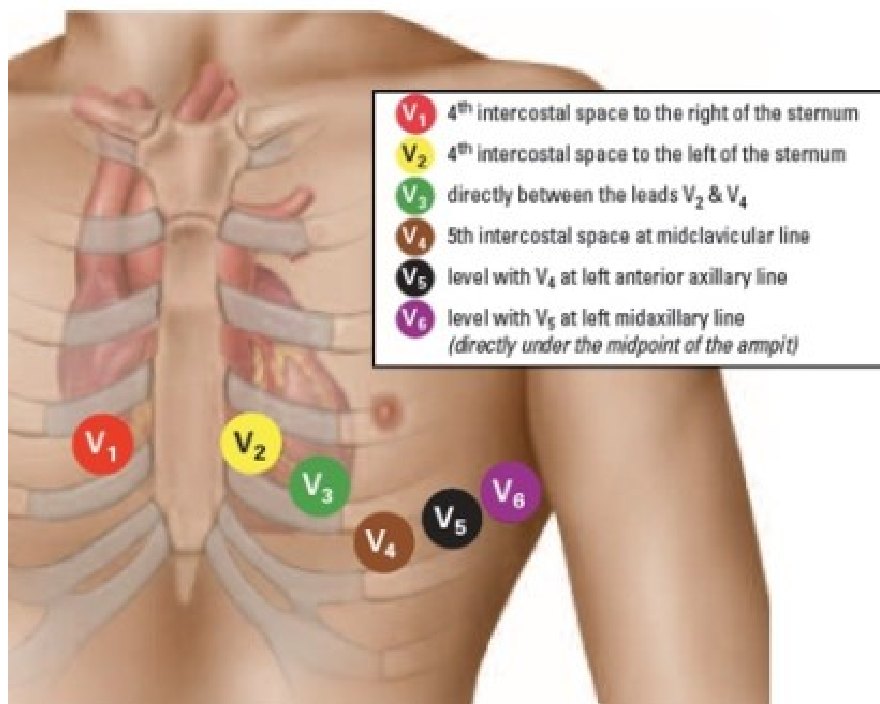
Management

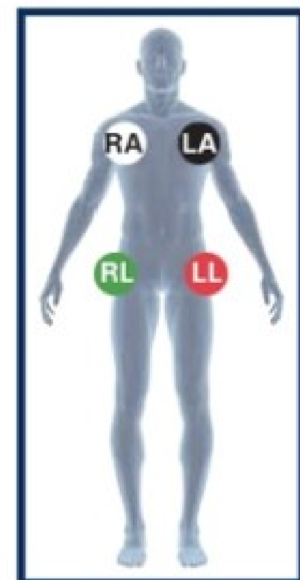
Intervention Sequence

Explain the need for ECG to patient and have all unnecessary personnel leave the room
Remove clothing from waist up, including bras if necessary
Removing areas of chest hair may be indicated for tracing
Place electrodes on patient and acquire 12 lead ECG
Poor tracings or artifact may be improved by prepping the skin with alcohol prep
Artifact with no external vibration is usually a problem with the ground lead
If RVI is suspected, perform V4R to confirm and follow appropriate protocol, label 12 lead “V4R”
A clean 12 lead tracing is very important in any patient with chest pain, perform on scene or in a non-moving ambulance as necessary to ensure appropriate diagnostic 12 lead is obtained

Electrode Placement Diagram

Proper placement of electrodes makes a difference in the quality of ECG tracing, take appropriate time and measures to ensure this is done correctly.





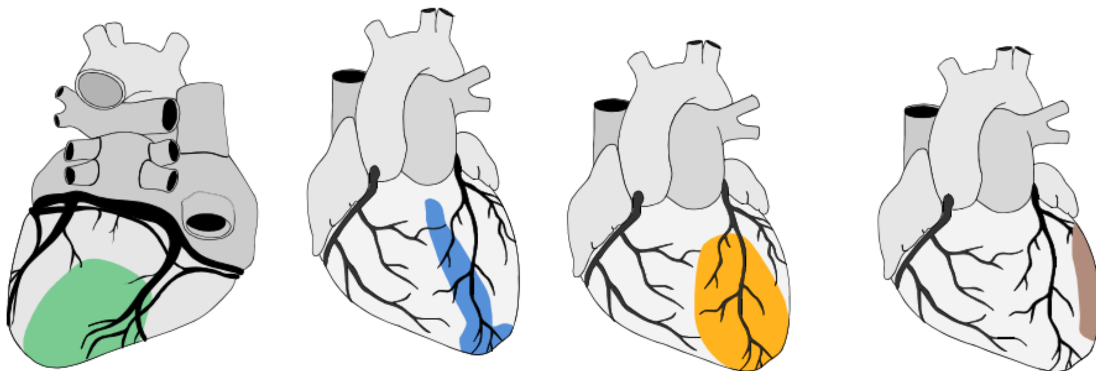
12 Lead ECG

Management – Continued

12 lead ECG Interpretation

1. ST Depression = Acute myocardial ischemia
2. T wave Inversion = Acute myocardial ischemia
3. ST Elevation = Acute myocardial injury
4. Pathological Q Waves = Recent Infarct
5. Reciprocal changes

Anatomy of Corresponding Leads



I	aVR	V1	V4
II	aVL	V2	V5
III	aVF	V3	V6

Inferior: II, III, AVF (RCA)
Septal: V1, V2 (LAD)
Anterior: V3, V4 (LAD)
Lateral: I, AVL, V5, V6 (Circ)

Documentation

Determine heart rate
Evaluate regularity
Note the presence or absence of P waves
Determine the PR interval
Determine QRS duration, narrow/wide complex
Determine upright or inverted T wave morphology
Evaluate the ST segments in relation to isoelectric line (elevation/depression)
Evaluate Q waves for physiologic vs. pathologic
Note signs of electrolyte imbalances such as peaked T waves (hyperkalemia)
Note signs of chamber enlargement (hypertrophy)
Note bundle branch blocks
Note any other arrhythmias or ectopic beats/changes

CPR Assist Devices or Adjuncts

Indication

Cardiopulmonary arrest with no signs of non-resuscitatiable death.

Zoll Auto-Pulse's may be utilized on pediatric patients aged eight or older and/or pediatric patients showing signs of puberty.

Management

Assessment

Onset, Provocation, Quality, Radiation, Severity, Time (OPQRST)
SAMPLE – Signs and Symptoms, Allergies, Medications, Previous Pertinent History, Last Oral Intake, Events Prior
Vital Signs (pulse, BP, respirations, skin condition, blood glucose)

Contraindications

Do **NOT** use device/adjunct on traumatic cardiac arrest patients with major chest trauma.

Intervention Sequence

Limit interruptions in chest compressions to no more than 5 seconds
Support ABC's
Oxygen for SPO2 <94%
Insert SGA, use in conjunction with ETCO2, if available
Consider Impedance Threshold Device (ITD), if available
Complete at least one full cycle of high-quality, hands-on CPR with the placement of an AED or manual defibrillator
Use CPR feedback device, if available
Place devise/adjunct according to manufacturer's recommendation/training
Treat cardiovascular emergencies as indicated; see **Chest Pain / Suspected Myocardial Ischemia** protocol
Treat cardiac arrest as indicated; see **Adult Cardiac Arrest** or **Pediatric Cardiac Arrest** protocols
Consider use of impedance device and elevating head to approximately 30˚, if appropriate

Transport Considerations

Refer to **Washington State Cardiac Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.2**, **Columbia County Operating Procedure #5.2**, or **Walla Walla County Operating Procedure #5.2**
Document all interventions and their effect in the MIR

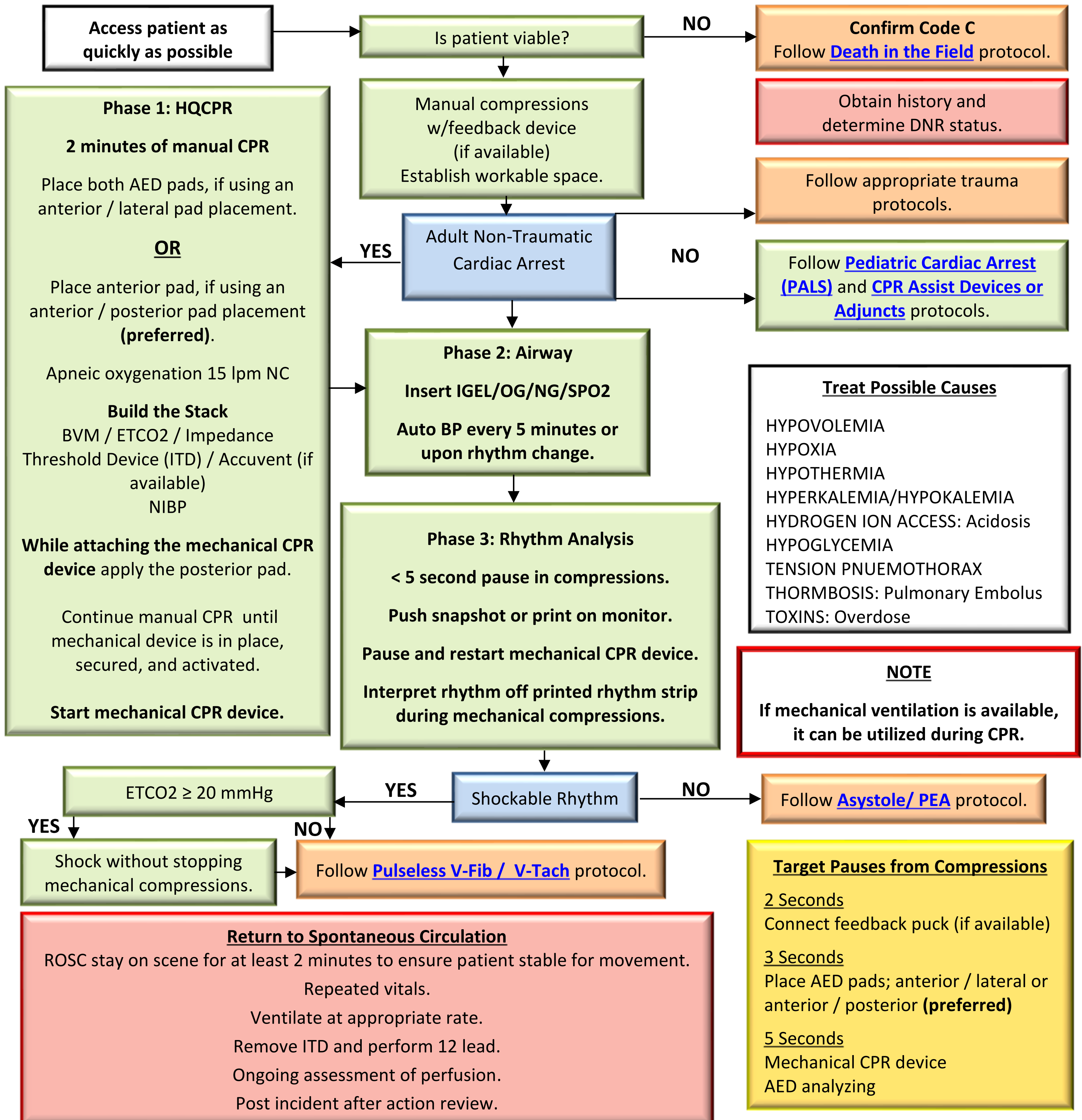
Complications

The use of any CPR device or adjunct will follow the manufacturer's recommendations and training. If any malfunction or damage to the device/adjunct occurs, immediately resume high-quality, hands-on CPR and continue until the normal conclusion of CPR activity is achieved.

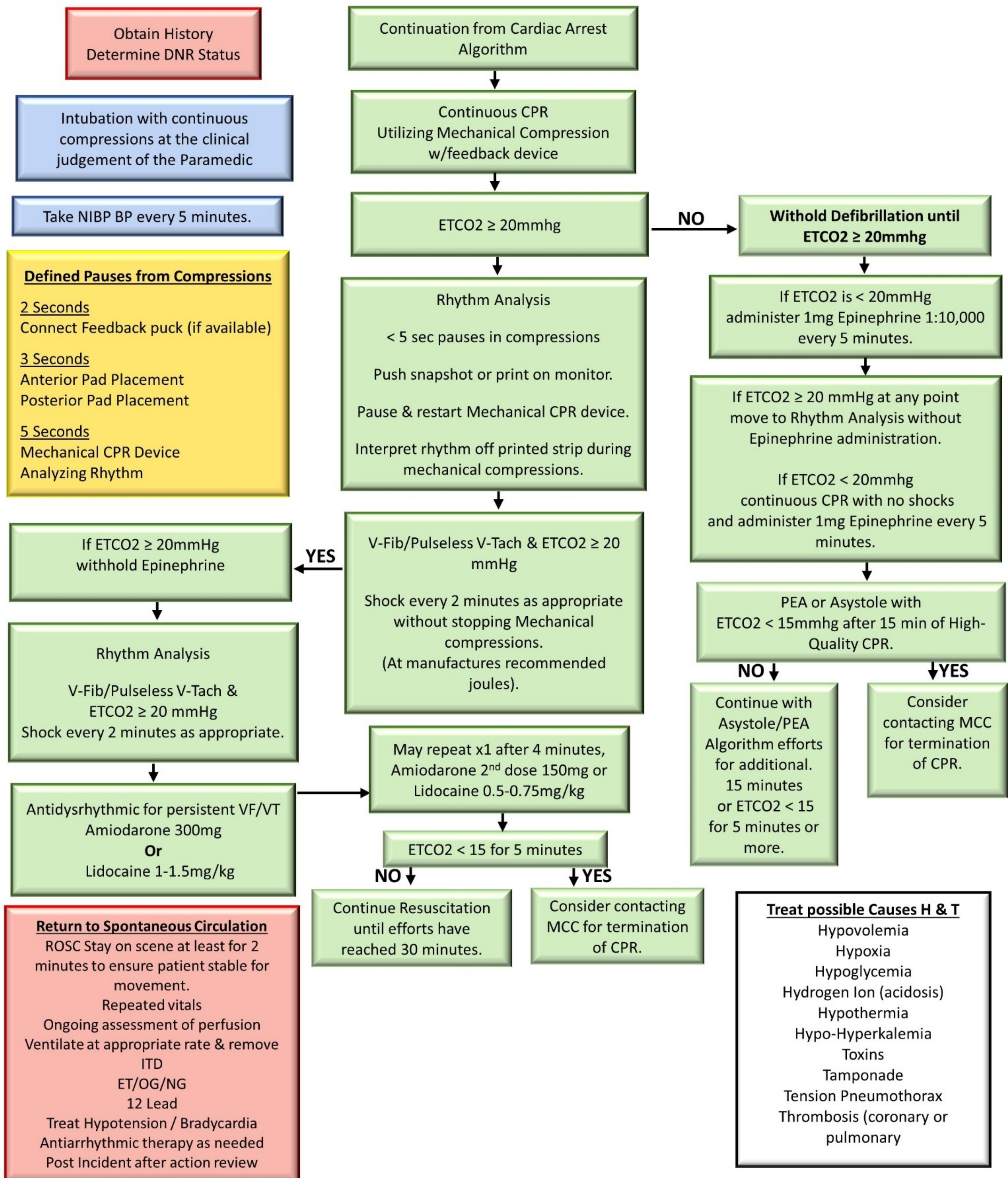
ACLS – Adult Cardiac Arrest Resuscitation

Indication

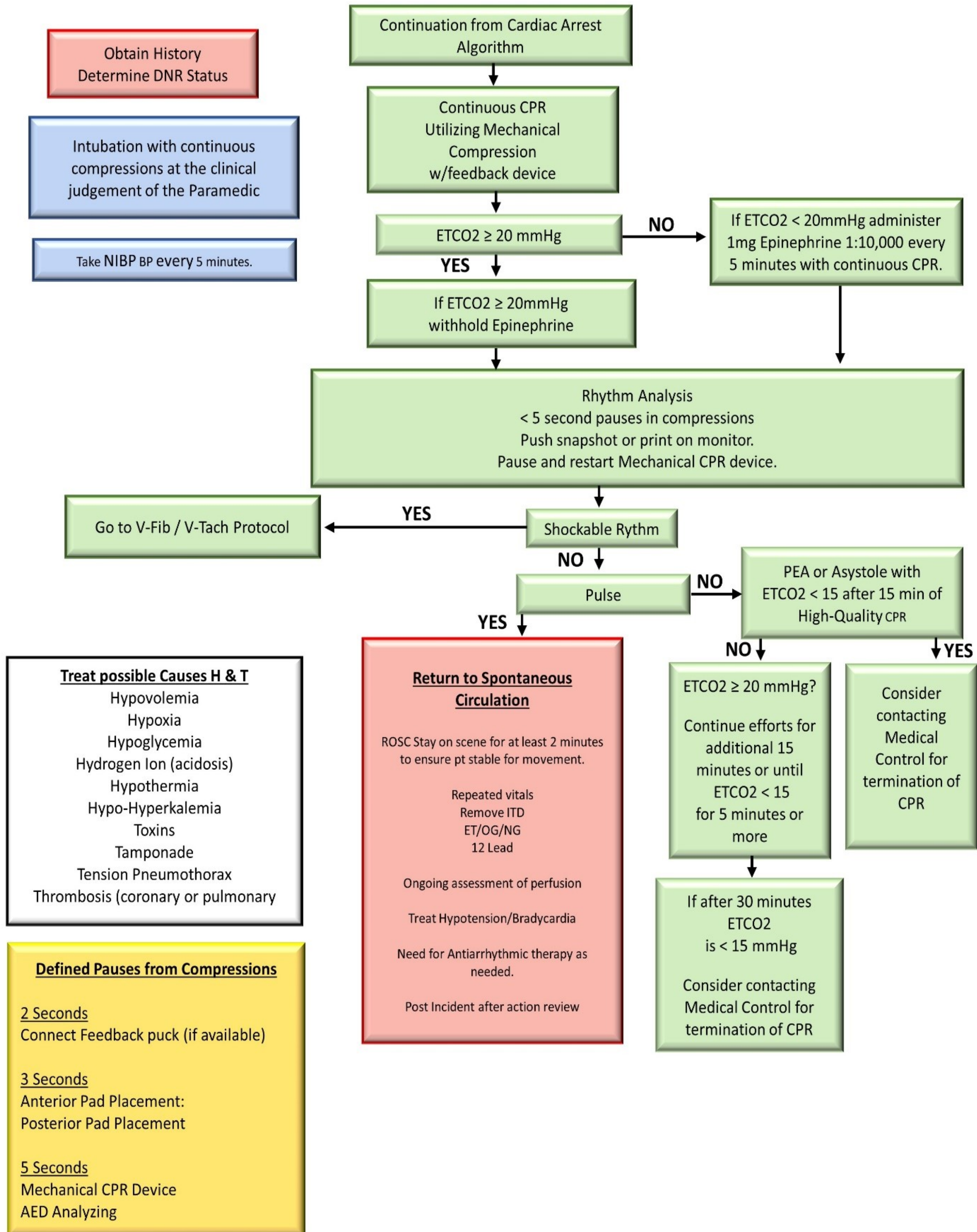
The antiarrhythmic used during resuscitation is at the discretion of the agency and/or lead provider. Once Amiodarone or Lidocaine has been administered, resuscitation efforts will continue with this drug ONLY unless otherwise directed by Medical Control.



ACLS – Pulseless Cardiac Arrest V-Fib / V-Tach Algorithm



ACLS – Pulseless Cardiac Arrest Asystole / PEA Algorithm

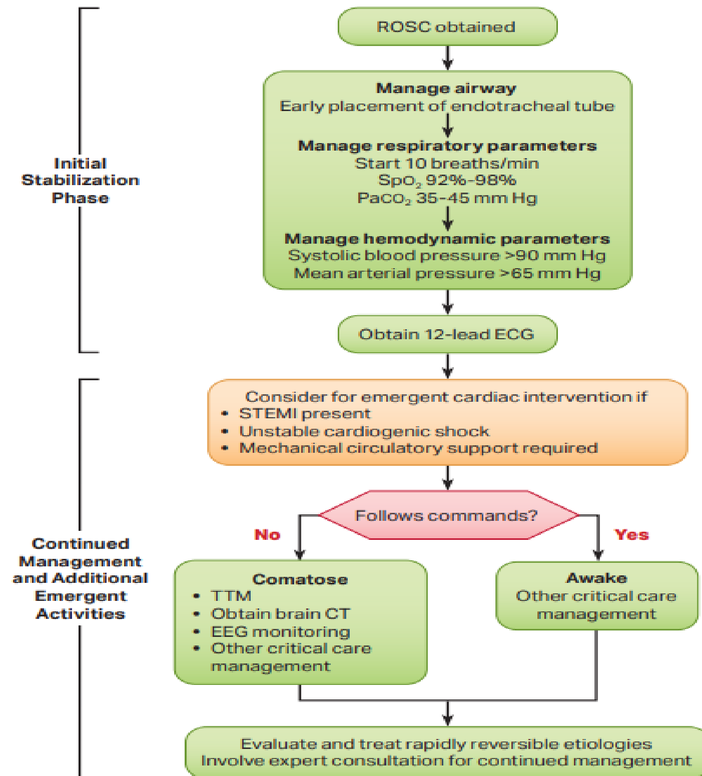


ACLS – Return of Spontaneous Circulation (ROSC)

Indication

All providers will follow current ACLS protocols for the treatment of post-cardiac arrest patients with return of spontaneous circulation (ROSC).

ACLS Healthcare Provider
Post–Cardiac Arrest Care Algorithm



Initial Stabilization Phase

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management: Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters: Titrate FIO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to $PaCO_2$ of 35-45 mm Hg
- Manage hemodynamic parameters: Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

- Emergent cardiac intervention: Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
  - Continuously monitor core temperature (esophageal, rectal, bladder)
  - Maintain normoxia, normocapnia, euglycemia
  - Provide continuous or intermittent electroencephalogram (EEG) monitoring
  - Provide lung-protective ventilation

H's and T's

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypokalemia/hyperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary

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Special Considerations

Immediately administer **Push Dose Epi (Epi 1:100,000)** if systolic BP is < 90mmHG. This is a bridge while Norepinephrine is being prepared. Administer **Push Dose Epi (Epi 1:100,000)** 20mcg every 2 minutes as needed to maintain BP > 90 or until Norepinephrine or Epinephrine drip is infusing with desired effects.

Norepinephrine and Epinephrine are the only vasopressors indicated for post cardiac arrest care in Walla Walla and Columbia Counties. Dopamine is not included in Paramedic drug formulary. Targeted temperature management is reserved for the hospital.

ACLS – Adult Bradycardia Algorithm

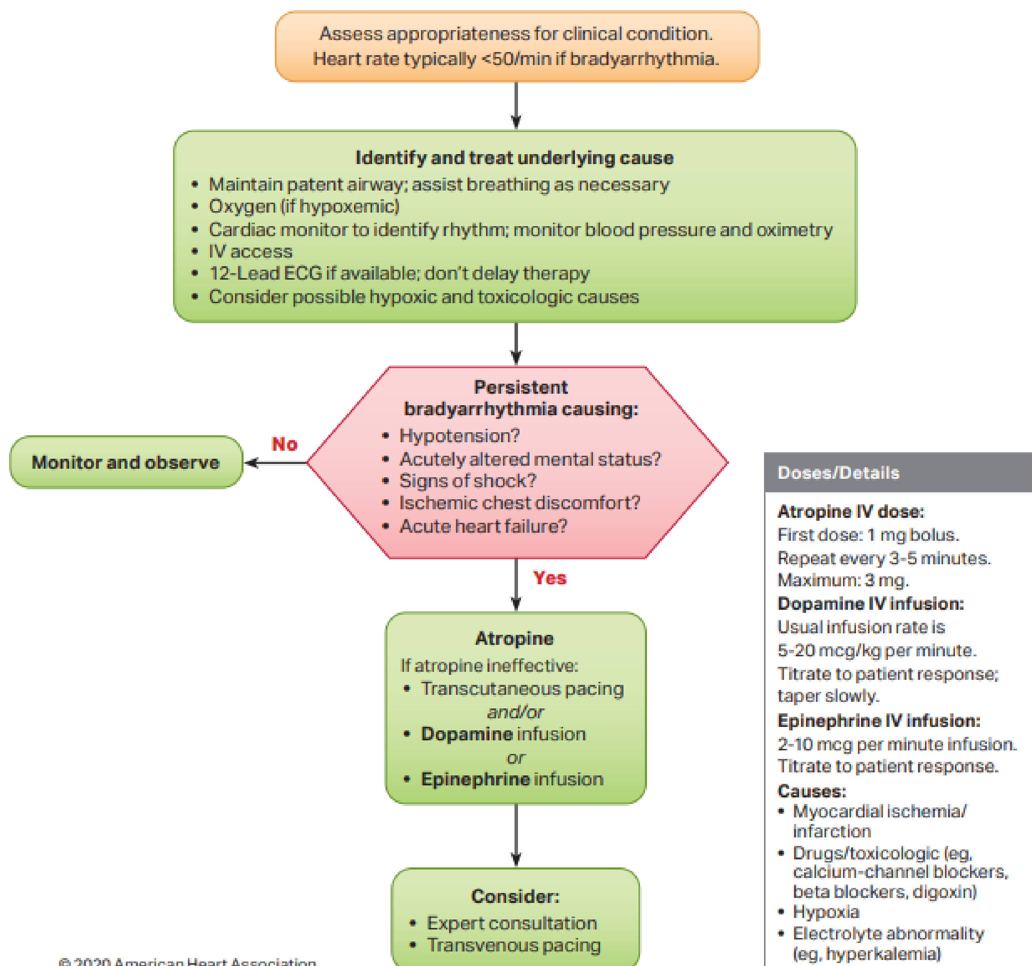
Indication

Symptomatic adult bradycardia.

Special Considerations

Providers should determine if the presenting bradycardia is pathologic or physiologic; symptoms secondary to the bradycardia; or the bradycardia is a symptom of another underlying pathology which does not require rate improvement such as hemorrhagic stroke or traumatic brain injury.

Epinephrine is the only vasoactive infusions indicated for symptomatic adult bradycardia. Dopamine is not included in Paramedic drug formulary. Consider sedation/analgesia during pacing.



ACLS – Adult Tachycardia Algorithm

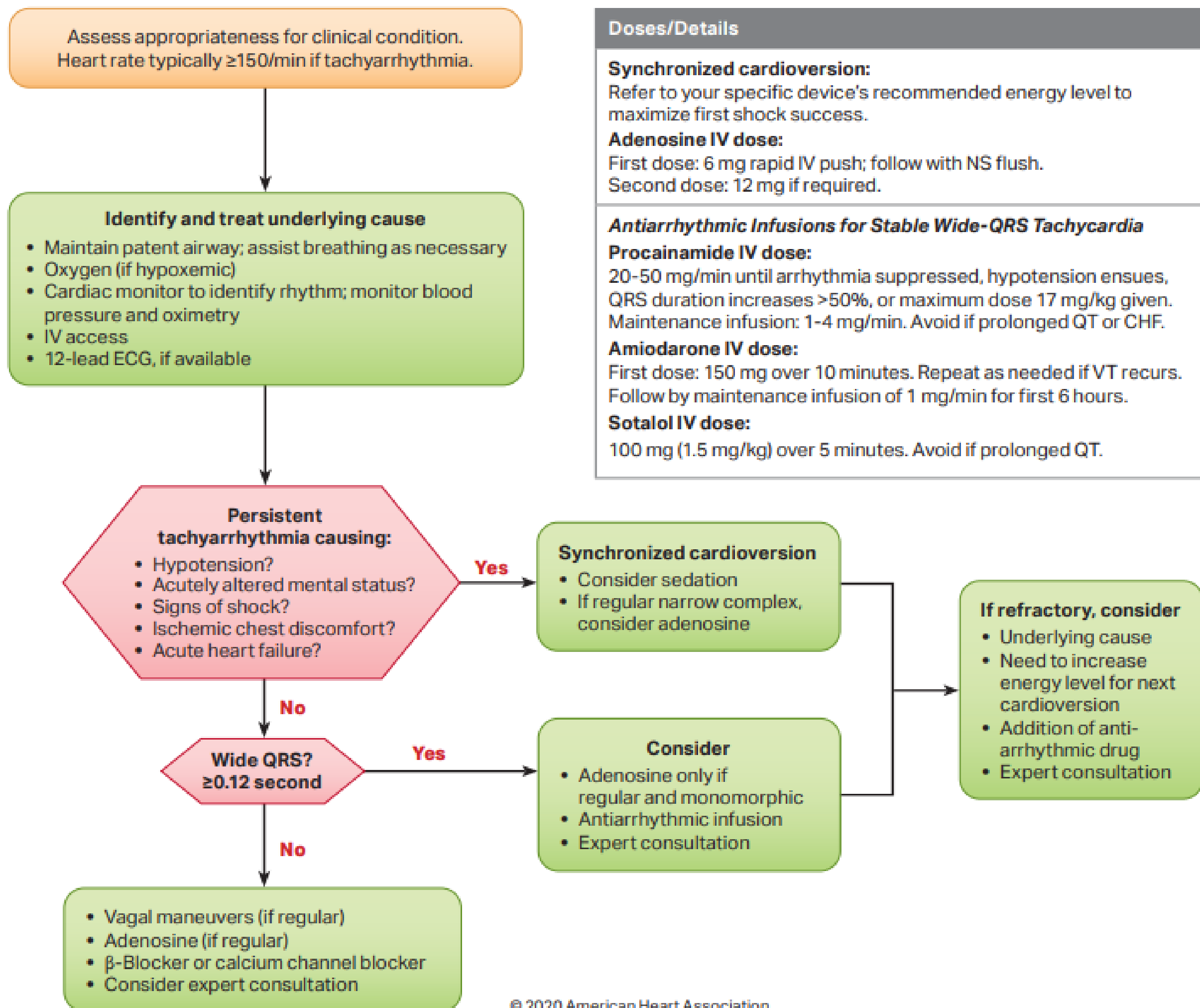
Indication

Symptomatic adult tachyarrhythmia / tachycardia.

Special Considerations

Providers should determine if the presenting tachycardia is pathologic or physiologic; symptoms secondary to the tachycardia; or the tachycardia is a symptom of another underlying pathology such as hypovolemia, drug use, etc.

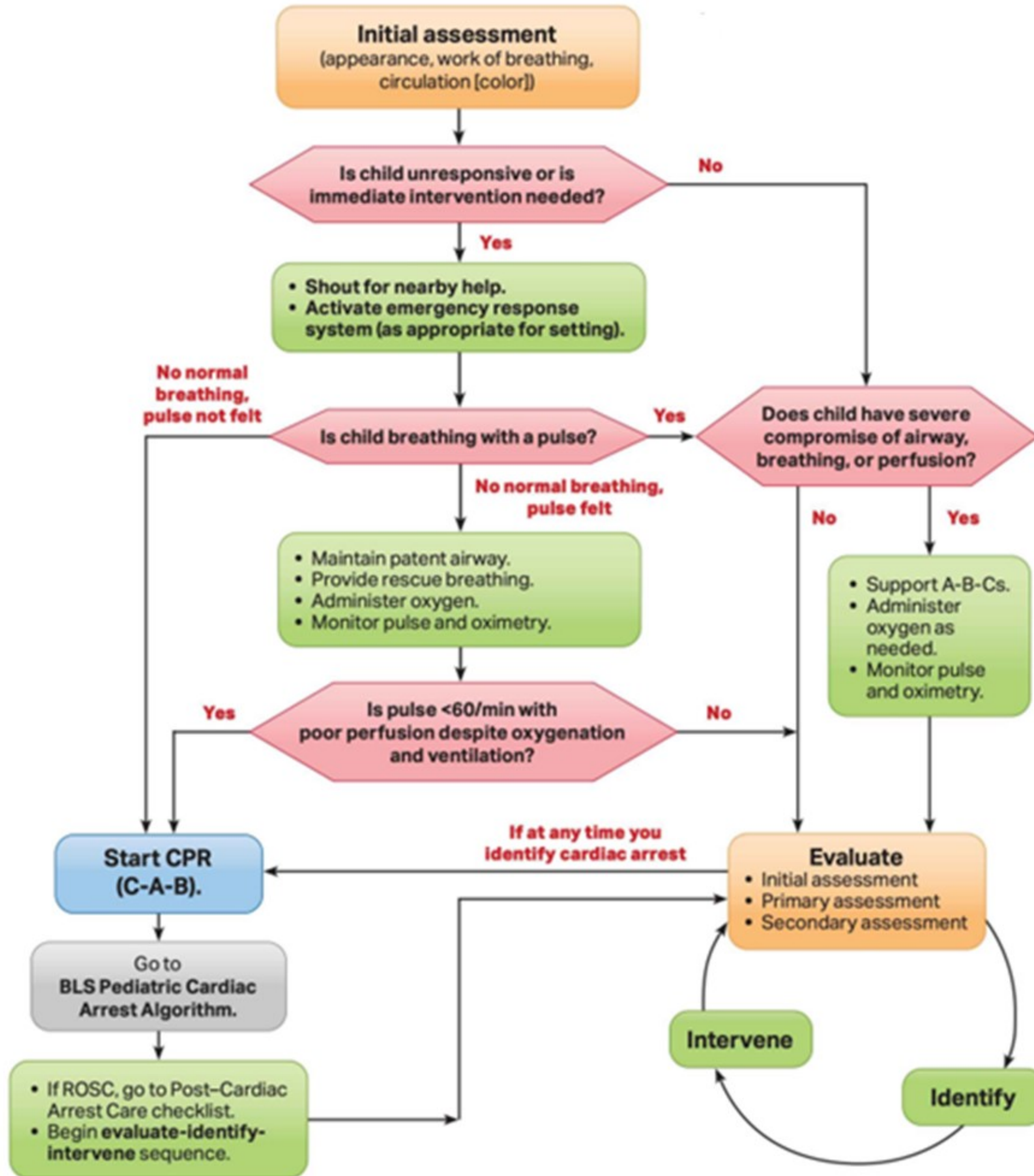
Adenosine, Diltiazem, and Amiodarone are the only antiarrhythmic drugs indicated for narrow symptomatic tachycardia in Columbia and Walla Walla Counties ALS protocols. Procainamide and Sotalol are not included in Paramedic drug formulary.



ACLS – Pediatric Systematic Approach (PALS)

Indication

American Heart Association – Systematic Approach Algorithm. PAT = Pediatric Assessment Triangle. Initial Assessment = appearance, work of breathing, skin color.



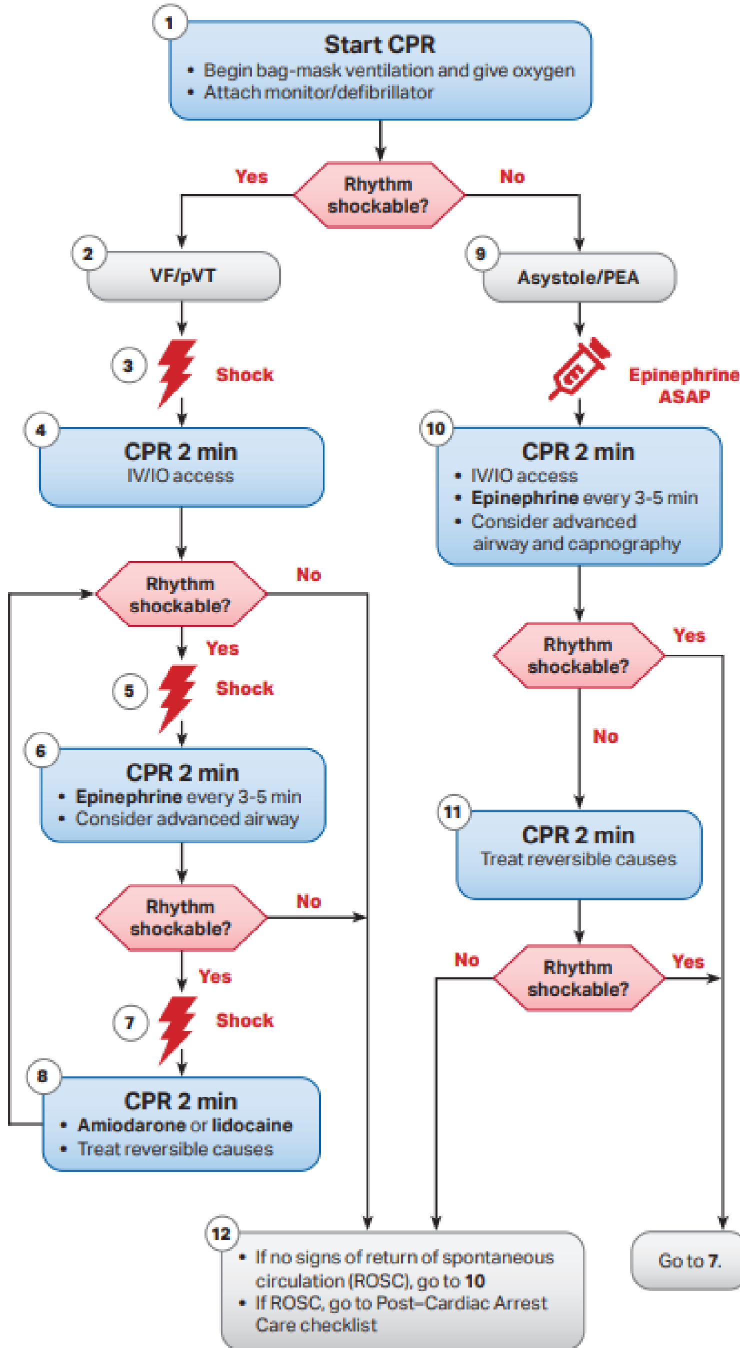
ACLS – Pediatric Cardiac Arrest Resuscitation (PALS)

Indication

All providers will follow current PALS protocols.

The antiarrhythmic used during resuscitation is at the discretion of the agency and/or lead provider. Once Amiodarone or Lidocaine has been administered, resuscitation efforts will continue with this drug ONLY unless otherwise directed by Medical Control.

Pediatric Cardiac Arrest Algorithm



CPR Quality

- Push hard (≥⅓ of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds

Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose

Drug Therapy

- **Epinephrine IV/IO dose:**
  0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration).
  Max dose 1 mg.
  Repeat every 3-5 minutes.
  If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- **Amiodarone IV/IO dose:**
  5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT
  or
  Lidocaine IV/IO dose:
  Initial: 1 mg/kg loading dose

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

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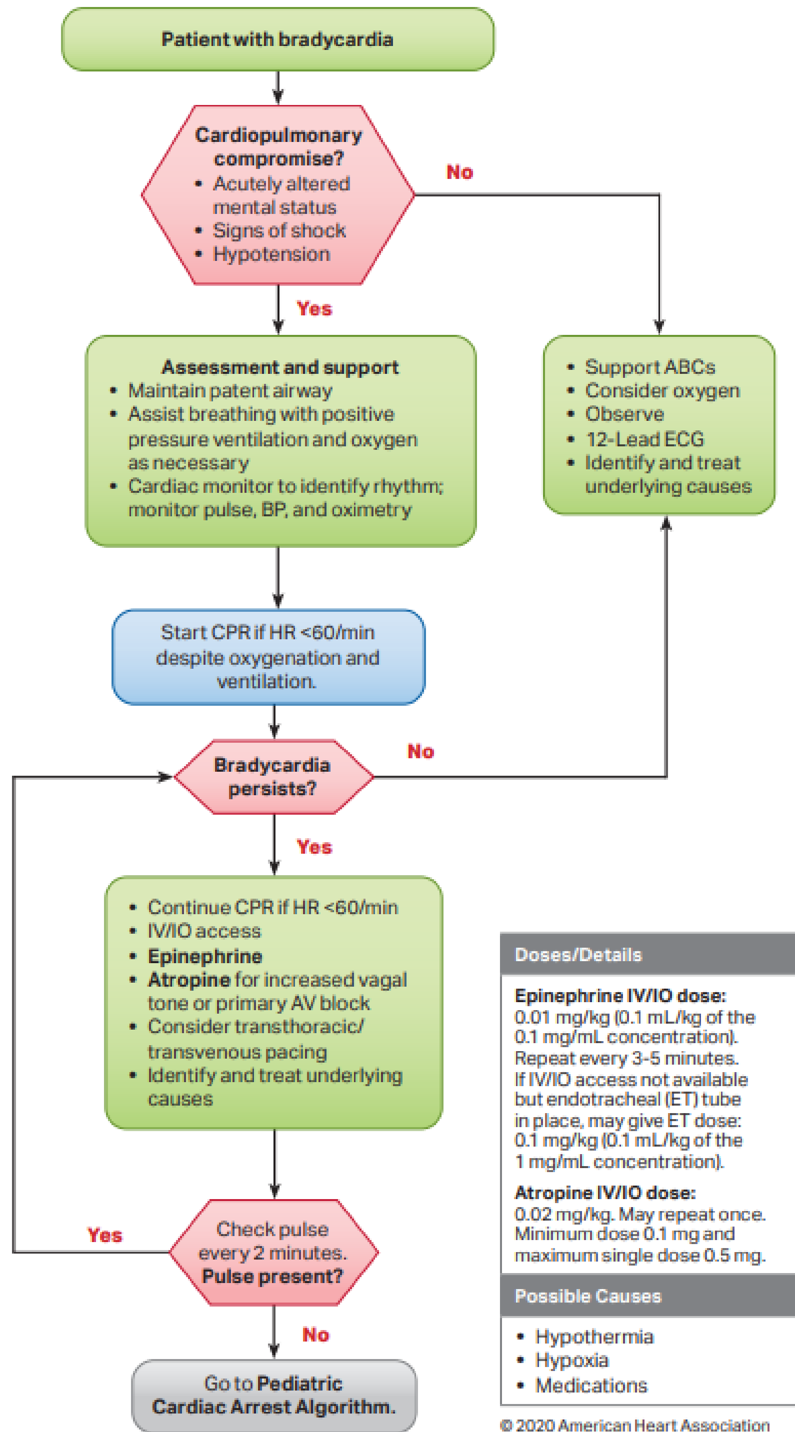
ACLS – Pediatric Bradycardia (PALS)

Indication

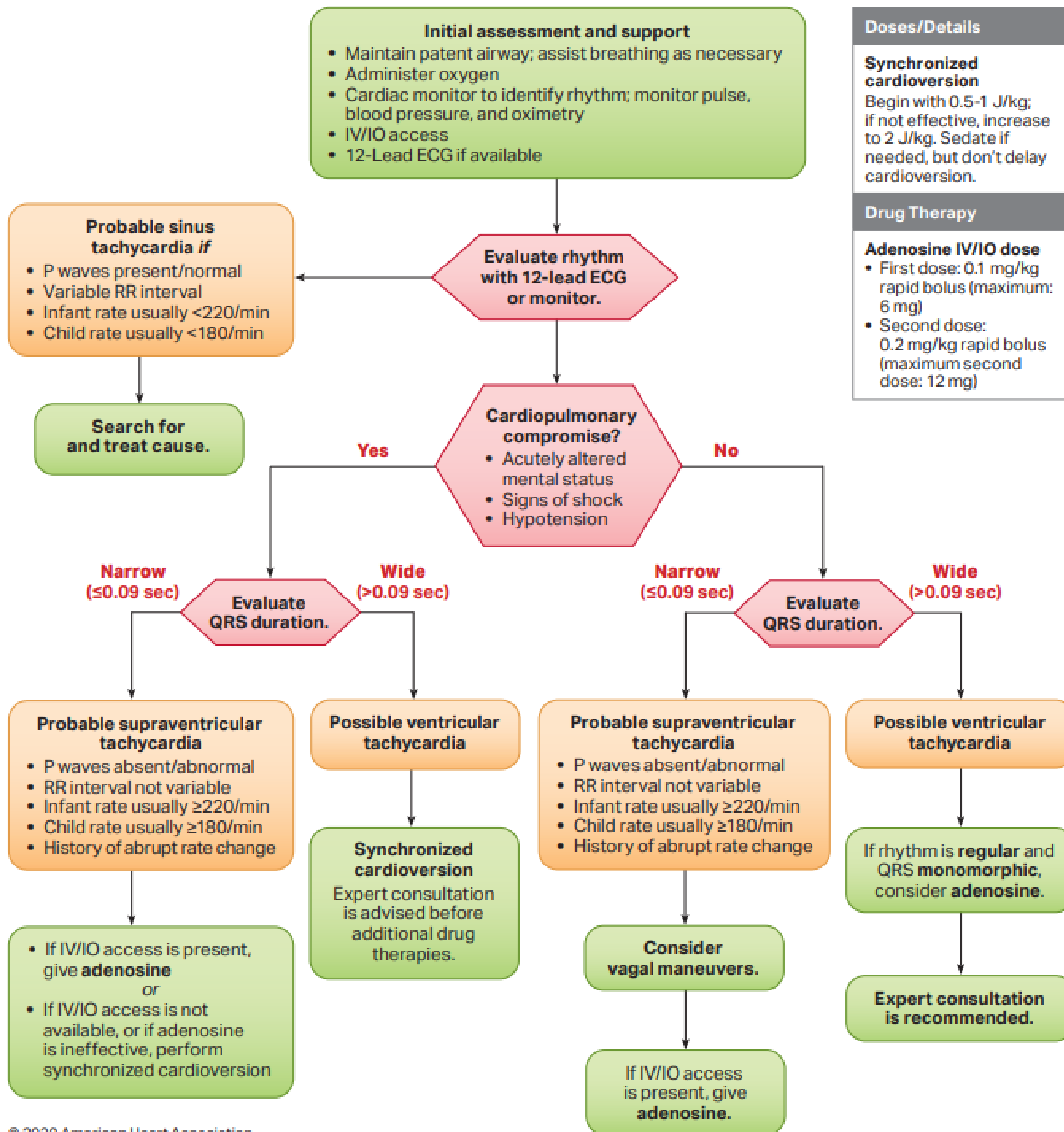
Symptomatic pediatric bradycardia with a pulse.



ACLS – Pediatric Tachycardia (PALS)

Indication

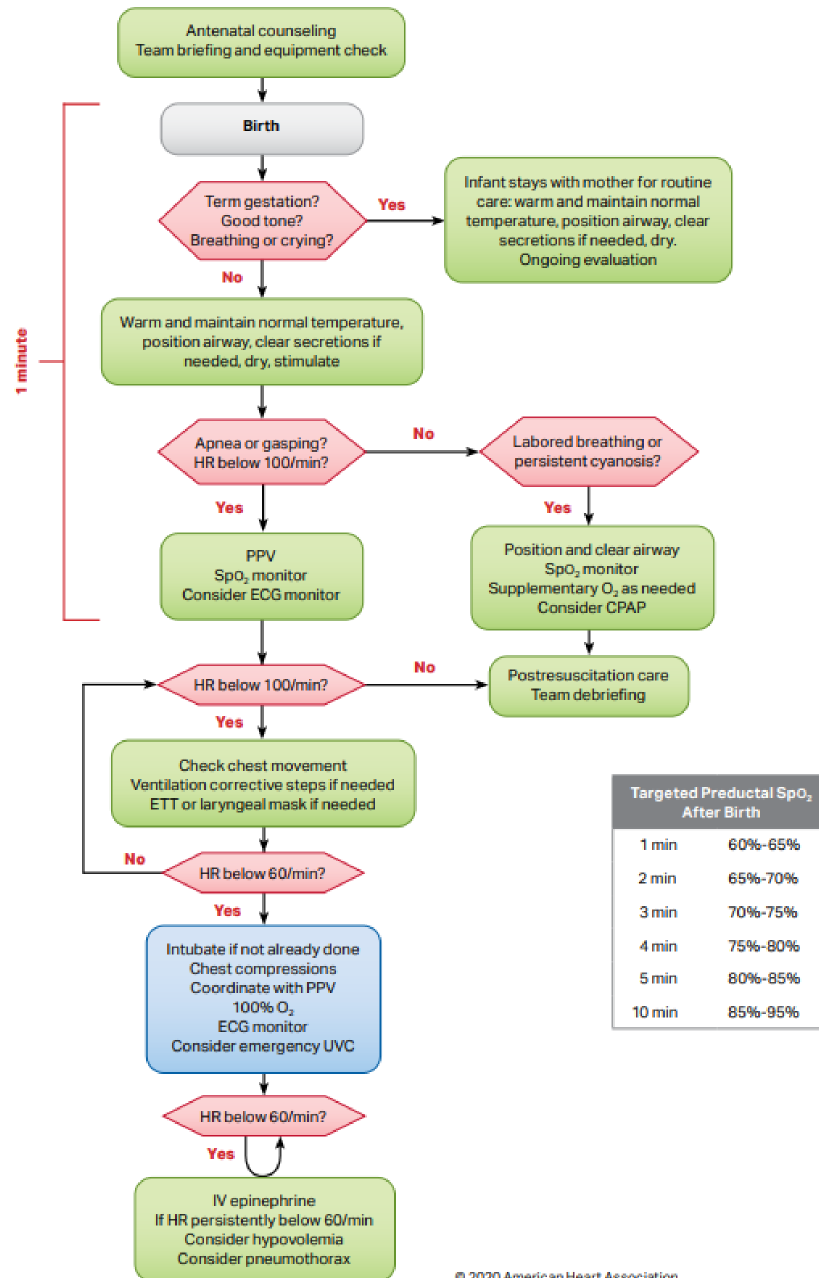
Symptomatic pediatric tachycardia with a pulse.



ACLS – Neonatal Resuscitation

Indication

All providers will follow current Neonatal Resuscitation protocols (NRP or equivalent). See Columbia and Walla Walla Counties specific protocol for **Active Labor** and **Post-Partum Care** as indicated.



Special Considerations

CPR Compression/ventilation ratio = 3:1
Cuffed ET tubes preferred if available

ACLS – Continuous Infusions

Indication

Approved vasoactive medications and infusion/drip rates for field reference (if no pump available).

Concentration Conversion Chart

Dose on Hand	100ml	250ml	500ml	1000ml
1mg	10mcg/ml	4mcg/ml	2mcg/ml	1mcg/ml
2mg	20mcg/ml	8mcg/ml	4mcg/ml	2mcg/ml
3mg	30mcg/ml	12mcg/ml	6mcg/ml	3mcg/ml
4mg	40mcg/ml	16mcg/ml	8mcg/ml	4mcg/ml

Norepinephrine (Levophed): To restore blood pressure in unstable patients with hypotension refractory to fluid resuscitation. Cardiogenic shock, neurogenic shock, septic shock, post-resuscitation hypotension after ROSC.

DESIRED DOSE	2mg/250cc (60gtt set)	4mg/250cc (60gtt set)	4mg/500cc (60gtt set)
#mcg/min	**Drops per min**	**Drops per min**	**Drops per min**
2	15	8	15
4	30	15	30
6	45	22	45
8	60	30	60
10	75	38	75
12	90	45	90
14	105	53	105
16	120	60	120
18	135	68	135
20	150	75	150
22	165	83	165
24	180	90	180
26	195	98	195
28	210	105	210
30	225	113	225

ACLS – Continuous Infusions

Indication – Continued

Preparation: Mix 1mg Epinephrine 1:1000 in 250ml NS or D5W (4mcg/ml).

Epinephrine: To restore blood pressure in unstable patients with hypotension secondary to anaphylactic shock, maintain sympathetic tone for respiratory compromise in acute exacerbations of asthma (status asthmaticus).

DESIRED DOSE	ADULT	PEDIATRIC
#mcg/min	**Drops per min**	**Drops per min**
0.1	N/A	1.5
0.25	N/A	3.75
0.5	N/A	7.5
1	N/A	15
2	30	30
3	45	N/A
4	60	N/A
5	75	N/A
6	90	N/A
7	105	N/A
8	120	N/A
9	135	N/A
10	150	N/A

Preparation: Mix 250mcg of Fentanyl in a 250ml bag of NS (1:1 concentration)

Fentanyl: Longer transport times and need for continued analgesia and sedation such as transfers, intubated patients, etc. Start infusion at **0.5 – 1 mcg/kg/hour** and titrate for effect to a max of 3mcg/kg/hr, not to exceed a total dose of 200mcg/hr.

DESIRED DOSE	ADULT (drops per min)				
#mcg/kg/hr	**60kg**	**70kg**	**80kg**	**90kg**	**100kg**
0.5	30	35	40	45	50
1	60	70	80	90	100
1.5	90	105	120	135	150
2	120	140	160	180	200
3	180	210	240	270	300

Death in the Field

Indication

Criteria to withhold or discontinue life support.

Management

If any question of uncertainty of the presence of life or death or the presence of a viable Do Not Resuscitate (DNR) or Portable Orders for Life-Sustaining Treatment (POLST), resuscitation should be initiated until the appropriate level of care is determined.

If patients' death is a result of blunt or penetrating injury, consider bilateral chest decompressions. Follow the Tension Pneumothorax and Pleural Decompression protocol.

Advanced life support MAY BE WITHHELD if any of the following exist:

Signs of irreversible death
Decapitation
Rigor Mortis in a warm environment
Dependent Lividity – venous pooling in dependent parts of the body
The patient is verified to be in hospice care
The patient has a POLST or DNR:
READ CAREFULLY - Forms may deny ACLS guided resuscitation efforts and artificial ventilation but authorize transport with comfort measures only including suction and pain control.

Trauma Arrest: Victims of blunt or penetrating force trauma with secondary cardiac arrest and no observable vital signs at the scene have a mortality rate of 100%. Cardiac arrest resuscitation in trauma should only be attempted if the transport has already begun and EMS providers witnessed the loss of vital signs. Contact Medical Control for clarification if needed.

Procedure:

1. Evaluate cardiac rhythm, confirm asystole in three leads
2. Cover the body with a sheet
3. Contact the appropriate authorities
4. Secure the scene
5. Do not remove personal property from the body
6. Do not disturb the scene or leave the body unattended
7. Assess the need for chaplain services for family/friends present

Discontinue resuscitation efforts:

For VF, VT with no pulse, PEA, or Asystole:

If no return of spontaneous circulation (ROSC) after 15 minutes of CPR and $ETCO_2 < 15$ contact Medical Control, give report of all interventions completed and request authorization to discontinue efforts, follow Medical Control recommendations.

If no return of spontaneous circulation (ROSC) after 15 minutes of CPR and $ETCO_2 > 15$, continue CPR for an additional 15 minutes, unless $ETCO_2$ is < 15 for greater than 5 consecutive minutes. If ROSC is still not achieved, contact Medical Control give report of all interventions completed and request authorization to discontinue efforts, follow Medical Control recommendations.

Documentation Considerations

Document all patient care/assessment including rhythm strip interpretation when applicable
Communication with Medical Control, include physician name and any verbal orders
DNR status or detailed POLST instructions if applicable, document notification of coroner
A copy of the POLST/DNR form should accompany the patient to the hospital if transport is initiated, present form the emergency department along with all other required documentation.

Sudden Infant Death Syndrome (SIDS)

Indication

To provide resuscitation treatment to the infant, if indicated, as well as supportive care to the family until other resources can be mobilized.

Management

Assessment

<u>If no signs of obvious death:</u>

Verify cardiopulmonary arrest
Refer to appropriate infant/pediatric resuscitation guidelines.
Discuss Transport decision with Medical Control

<u>If signs of obvious death:</u>

Disfiguration of face with “squashed nose”
Frothy, blood-tinged mucous around infant’s mouth or nostrils
Dependent lividity (pooling of blood in dependent body areas may appear as blotching)
Rigor mortis in a warm environment

Intervention Sequence

Do not initiate resuscitation procedures unless family refuses to acknowledge the infant’s death.
Acknowledge the parent’s and family’s feelings of grief, and provide calm, authoritative guidance.
Dispatch appropriate resources including law enforcement, county coroner, and a chaplain if available to assist the family.
Consider activation of a Critical Incident Stress Debriefing (CISD) Team after the incident

Documentation Considerations

Observe scene carefully, document thoroughly
Location and position of child.
Objects immediately surrounding the child.
Behavior of all individuals present.
The explanations provided.
Emesis in mouth or foreign body present.
Assess for and consider possible abuse. If suspected, notify CPS by telephone immediately following completion of the call.

<u>Child Protective Services (CPS): 1-866-ENDHARM (1-866-363-4276)</u>
Document notification time and CPS representative taking report

Respiratory Distress

Indication

General approach to respiratory distress of any origin.

Management

Assessment

Accessory muscle use, retractions, tripod positioning, inability to speak due to labored breathing, abnormal lung sounds, and history of respiratory pathology.

Consider Underlying Causes

Acute MI
ARDS
Arrhythmia
Allergic reaction / anaphylaxis
Anxiety / panic attack
Asthma
COPD / Emphysema
Congestive Heart Failure
Croup / Epiglottitis
Environmental / exposure
Pneumonia / Pleurisy
Pulmonary embolism
Pneumothorax (spontaneous / traumatic)
Sepsis

Intervention Sequence

Open and maintain airway with manual maneuvers / OPA / NPA
Assist breathing with positive pressure ventilation and intubate as needed
COPD patients often use hypoxic drive, determine baseline Sp02 readings and accept <90 and/or > 85% as normal baseline saturations for these patients.
Consider ETCO2 monitoring for all patients with respiratory compromise, use as a diagnostic tool for breathing pattern, rate, and to identify states of respiratory acidosis / alkalosis.
Move patient to sitting position to facilitate breathing
Oxygen titrated to condition; CPAP as indicated - DO NOT DELAY
Albuterol / **Ipratropium** (Duo-Neb) as indicated, consider steroid for severe cases with prolonged transport times or any patient which may benefit from pre-hospital administration.
Intubate if required, see **RSI** protocol

Parameters to consider for intubation include (not limited to):

Airway swelling, inability to manage secretions/swallow
Decreased LOC / GCS, rapidly worsening fatigue
SPO2 <90% despite therapy
Respiratory rate < 10 > 29
Anticipated clinical course
Impending respiratory failure

Congestive Heart Failure / Acute Pulmonary Edema

Indication

Respiratory distress with or without chest pain, peripheral edema, pink frothy sputum, known history of heart failure and objective exam findings.

Management

Assessment

Dyspnea, respiratory rate <10 or >30
Pink frothy sputum
Jugular venous distention (JVD)
Peripheral edema with pitting or weeping
Wet lung sounds / audible gurgling
Vital signs consistent with cardiogenic shock
Medications support history (diuretics, anti-hypertensives)

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Move patient to sitting position to facilitate breathing
CPAP - DO NOT DELAY
Adjust PEEP to patient comfort and positive response
Establish IV access
Monitor cardiac rhythm
Transport without delay
Intubate if required, see **RSI** protocol
Observe closely for rapid deterioration (flash edema)

Transport Considerations

Contact Medical Control as needed
Anticipate respiratory failure
Notify receiving facility for specific needs upon unit arrival such as respiratory therapy for continued CPAP, BiPAP, or to prepare for intubation.

Pharmacology

SBP>110 mmHg
Nitroglycerin **0.4mg SL** tabs or spray. Titrate to effect (max of 1.2mg) then contact Medical Control.

SBP<90 mmHg
Norepinephrine **2-4mcg/min**, titrate infusion to SBP>90, **up to 30mcg/min**, deliver via IV pump if available; may also use micro (60gtt) IV tubing, titrate slowly as Norepinephrine is a potent vasopressor. Blood pressure should be taken with every titration in drip rate.

Asthma

Indication

Respiratory distress secondary to asthma with exacerbation.

Management

Assessment

Dyspnea, respiratory rate <10 or >30

Inspiratory and/or expiratory wheezing, audible or with auscultation
History and exam objectify asthma exacerbation

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Epinephrine for severe cases – DO NOT DELAY
Consider CPAP in conjunction with pharmacotherapy
Establish IV access Monitor cardiac rhythm
Intubate if required, see **RSI** protocol
Consider ETCO2 monitoring

Transport Considerations

Transport without delay
Contact Medical Control as needed

Pharmacology

Albuterol Sulfate **2.5mg nebulized** with 6-8 L/oxygen; repeat as needed for continued or worsening symptoms. Discontinue if patient develops chest pain or tachycardia increases.

Ipratropium Bromide **0.5mg nebulized** with 6-8 L/oxygen, single dose only; may substitute for Duo-Neb (Albuterol/Ipratropium) as initial treatment.

Methylprednisolone **125mg** moderate to severe cases, especially for prolonged transports. **Pediatrics: 1-2mg/kg IV** up to a max of 125mg.

Epinephrine **0.3mg 1:1000 IM** for adult with acute exacerbation (Status Asthmaticus), repeat every 5-10min as needed for continued or worsening symptoms.
Pediatrics: 0.01 mg/kg (0.15mg) up to 0.3mg.

Magnesium Sulfate **25-50mg/kg infusion over 10 min** for pediatric with acute exacerbation (Status Asthmaticus). Recommended preparation: dilute weight-based dose in 100ml NS, deliver via IV pump if available, monitor for hypotension.

Epinephrine infusion **2-10mcg/min** titrate infusion to response; maintain infusion at drip rate that achieves positive effect. Deliver via IV pump if available, however micro-drip (60gtt) IV tubing may be used, titrate slowly as Epinephrine is a potent vasopressor.
Pediatrics: 0.1-2mcg/min

Chronic Obstructive Pulmonary Disease (COPD)

Indication

Respiratory distress secondary to COPD with exacerbation.

Management

Assessment

Dyspnea, respiratory rate <10 or >30
Abnormal lung sounds
Accessory muscle use and retractions
Tripod position
Pursed lip breathing
One- or two-word answers to questions
Near syncope
History and exam indicate COPD/emphysema exacerbation with inspiratory and/or expiratory wheezing, rhonchi with auscultation. Recognize that increased wheezing is associated with underlying COPD may represent CHF, pneumothorax, and/or underlying infection.

Intervention Sequence

Support ABC's
CPAP if respiratory drive inadequate - DO NOT DELAY
Adjust PEEP to patient comfort and positive response
Establish IV access
Monitor cardiac rhythm
Intubate if required, see **RSI** protocol
Observe closely
Consider ETCO2 monitoring

Transport Considerations

Transport without delay
Contact Medical Control as needed

Pharmacology

Albuterol Sulfate **2.5mg nebulized** with 6-8 L/oxygen; repeat as needed for continued or worsening symptoms. Discontinue if patient develops chest pain or tachycardia increases.

Ipratropium Bromide **0.5mg nebulized** with 6-8 L/oxygen, single dose only; may substitute for Duo-Neb (Albuterol/Ipratropium) as initial treatment.

Methylprednisolone **125mg** moderate to severe cases, especially for prolonged transports. **Pediatrics: 1-2mg/kg IV** up to a max of 125mg.

Special Considerations

Steroids can increase fluid retention and hypertension; worsening CHF/pulmonary edema. Consider risk versus benefit in COPD patients with concurrent heart failure, consult Medical Control as needed.

Allergic Reaction / Anaphylaxis

Indication

Respiratory distress secondary to allergic reaction / anaphylaxis.

Management

Assessment

Dyspnea, respiratory rate <10 or >30
Airway swelling / angioedema, isolated or full body hives (urticaria)
Audible wheezing inspiratory and/or expiratory wheezing with auscultation
History of known allergy or exam findings indicate allergic reaction / anaphylaxis

Intervention Sequence

Remove stinger if bee sting
Support ABC's and apply oxygen if SPO2 <94%
Epinephrine for severe cases - DO NOT DELALY
Establish IV access and monitor cardiac rhythm
Intubate if required, see **RSI** protocol

Transport Considerations

Transport without delay, contact Medical Control if intubation will be required in the ED

Pharmacology

Fluid challenge: 20ml/kg for SBP<100

Albuterol Sulfate **2.5mg nebulized** with 6-8 L/oxygen; repeat as needed for continued or worsening symptoms. Discontinue if patient develops chest pain or tachycardia increases.

Ipratropium Bromide **0.5mg nebulized** with 6-8 L/oxygen, single dose only; may substitute for Duo-Neb (Albuterol/Ipratropium) as initial treatment.

Diphenhydramine **25-50mg** for hives, itching, flushing due to severe reaction.
Pediatrics: 1-2mg/kg or as directed by Medical Control.

Methylprednisolone **125mg** moderate to severe cases, especially for prolonged transports.
Pediatrics: 1-2mg/kg IV up to a max of 125mg

Epinephrine **0.3mg 1:1000 IM** for adult with acute anaphylaxis, airway swelling or respiratory distress, repeat every 5-10min as needed for continued or worsening symptoms.
Pediatrics: 0.01 mg/kg (0.15mg) up to 0.3mg

Epinephrine infusion **2-10mcg/min** titrate infusion to response; maintain infusion at drip rate that achieves positive effect. Deliver via IV pump if available, however micro-drip (60gtt) IV tubing may be used, titrate slowly as Epinephrine is a potent vasopressor.
Pediatrics: 0.1-2mcg/min

Croup / Epiglottitis

Indication

Children with signs and symptoms of upper respiratory infections, croup, or epiglottitis

Management

Assessment

Croup:

Age from 6 months to 3 years of age and usually presents with gradual onset, often resulting from upper respiratory infection causing laryngeal edema, symptoms may be worse at night and may or may not have a fever. Condition varies from mild to severe, classic symptoms include stridor on inspiration and "seal-like" barking cough.

Epiglottitis:

Age typically greater than 2 years old, onset is rapid. Patient progresses to appear SICK very quickly. Symptoms include high fever, respiratory distress and signs of air hunger, nasal flaring, restlessness, drooling, and retractions. The child usually wants to sit upright.

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Consider blow-by oxygen, pediatric patients rarely tolerate a mask; moving the patient to cool air outside may relieve breathing difficulty.
Approach the patient in a calm, reassuring fashion.
Anxiety is likely to exacerbate the child's condition.
Allow the child to assume their own position of comfort.
Avoid startling the patient and minimize external stressors.
Intubate if required, see RSI protocol

Transport Considerations

Transport in a parent's lap if possible
Contact Medical Control as needed

Pharmacology

Stridor at rest with respiratory distress/increased work of breathing as noted by intercostal retractions, tachypnea, agitation, or difficulty speaking consider the following:

Epinephrine 3mg 1:1000 (3 vials of 1mg/1ml concentration) diluted in 3ml NS nebulized; this yields 0.25ml Racemic Epinephrine solution.

Contact Medical Control for additional therapies including breathing treatments with 3ml of nebulized saline, bronchodilators and methylprednisolone as directed by Medical Control.

Airway: Continuous Positive Airway Pressure (CPAP)

Indication

Severe respiratory distress and/or impending respiratory failure secondary to following:

- Heart failure with acute pulmonary edema
- Acute hypoxic respiratory failure
- Acute worsening of COPD (exacerbation with limited air exchange)
- Status asthmaticus
- Poor air exchange making nebulizer treatments ineffective
- Patient preference to avoid intubation

Contraindications

Facial deformity (mask leak), hemodynamic instability, inability to clear secretions, inability to tolerate mask, inability to maintain airway or respiratory drive and patients less than 8 years of age.

Management

Assessment

- Severe difficulty breathing
- Retractions and accessory muscle use
- Pursed lips and one-to-two-word sentences
- Wet lung sounds
- Evidence of pulmonary edema including wet cough or spitting up pink frothy sputum
- Increased fatigue from labored breathing

Intervention Sequence

- Explain therapy to patient
- Position patient in optimal position to promote ease of breathing (usually sitting upright)
- Request assistance from partner for proper measurement and placement of mask
- Start high flow oxygen to mask
- Place CPAP mask on patient or have patient hold mask to their face finding a good seal
- Tighten straps to stop leaks.
- Reassess the patient's status frequently.
- Titrate PEEP (5-10cmH20) and FiO2 (if available) to patient response.

Pharmacology

Consider a low dose benzodiazepine for anxiety and claustrophobia, use caution or withhold in patients whose respiratory drive may be taken away completely by sedatives or if patient has altered mental status.

Lorazepam 0.5-2mg

Midazolam 1-2mg

Airway: Endotracheal Intubation

Indication

Procedure for endotracheal intubation; crash airway or RSI.

Management

Preparation:

1. Gather ALL required equipment: laryngoscope (standard or video), various blades, ET tubes with stylet, suction, oxygen source, BVM, bougie, 10cc syringes, lubricant, eye protection, NG/OG tube, tube holder, stethoscope, and any other necessary equipment the provider may require.
2. Position at the patient's head
3. Inspect suction, laryngoscope, test inflate ETT cuff to ensure no air leak
4. Pre-oxygenate patient with 100% oxygen and 15 lpm NC, manually ventilate if necessary

Intervention Sequence

1. Observe SPO2 for desaturation, if they drop <90%, stop and hyperventilate for 30-60 seconds before intubation is re-attempted (not applicable to all patients, some patients may not reach desirable saturation based on lung disease and other health factors.
2. Place patient in sniffing position
3. Inspect oropharynx for secretions, foreign bodies, dentures
4. Suction as needed
5. Hold laryngoscope in left hand
6. Open the patient's mouth with fingers of your right hand
7. Gently insert laryngoscope blade in the right side of the mouth
8. Move the blade toward the midline, displacing the tongue to the left
9. Curved blade: advanced blade tip into vallecula
10. Straight blade: advance the blade tip under the epiglottis
11. Gentle upward traction will expose the glottic opening
12. Advance ET tube through the vocal cords to appropriate depth, document cm at teeth
13. Inflate cuff with 5-10cc of air depending on tube size
14. Note cm depth markings of ET tube
15. Confirm successful intubation with primary / secondary measures and document the following: Primary: Lung sounds, negative over epigastrium, mist in the tube, chest rise and fall and good compliance with ventilation, esophageal detection device (Toomey syringe).
    Secondary: Positive ETCO2 waveform capnography
16. Secure ET tube with commercial device
17. Ventilate with 100% oxygen by BVM, consider moving to mechanical ventilator, see **Mechanical Ventilation** (Pneumatic ventilator) protocol
18. Consider NG/OG tube insertion to relieve gastric air and/or contents
19. Continuously monitor the patient and reassess all airway and breathing frequently
20. Verify tube placement before and after all movements of the patient, including prior to any IFT (Interfacility-transfer) in which the patient was intubated by another provider prior to the transfer of care.
21. **Agencies carrying video laryngoscopes from different manufactures may deviate from the above interventions to ensure compliance with manufacturer specific guidelines provided all personnel have received appropriate training prior to implementation of the device.**

Airway: Rapid Sequence Intubation (RSI)

Indication

Patients who present with signs and symptoms of imminent airway collapse and anticipated clinical course is likely to result in their inability to maintain airway patency, manage secretions and protect against aspiration.

Management

Assessment

Decreased LOC / GCS<8, airway swelling, inability to manage secretions
Respiratory rate < 10 > 30 with SPO2 <90% despite therapy
Obvious signs of fatigue and/or impending respiratory failure (anticipated clinical course)
Use the following acronyms to aid in airway assessment:

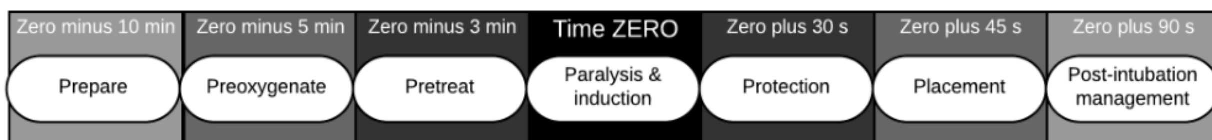
MOANS Assessment: anticipated difficulty with positive pressure ventilation

- **M**ask seal: facial hair, deformity to lower facial continuity.
- **O**besity: pregnancy or morbid obesity
- **A**ge: >55 increases difficulty
- **N**o teeth: remove dentures if necessary
- **S**tiffness: Lung compliance, COPD, ARDS, asthma, sleep apnea.

LEMON Assessment: anticipated difficulty with intubation

- **L**ook externally: assess for difficult intubation, small mouth, and anterior larynx
- **E**valuate: 3-3-2 rule, mouth open, mandible, and glottis
- **M**allampati: Order of increasing difficulty, class 1-4
- **O**bstruction: stridor, angioedema, abscess, muffled voice, emesis, or secretions
- **N**eck mobility: trauma, arthritis, kyphosis, short neck

Intervention Sequence: The 7 P's of RSI



1. **Preparation**
   Prepare all equipment including oxygen supply, bag valve mask, endotracheal tubes of varying sizes, elastic bougie, suction readily available, supra-glottic rescue device (I-Gel) and induction/paralytic medications, and ensure IV access is secure. Delegate tasks as necessary and ensure coordination of resources is maintained.

2. **Pre-Oxygenation**
   Open airway with manual maneuvers and adjuncts as needed, apply oxygen- 15L/min Nasal Cannula or NRB mask (passive oxygenation) if patient is breathing adequately. Patients who have been on CPAP> 3 minutes are adequately pre-oxygenated. BVM pre-oxygenation only indicated for hypoxia/ inadequate respiratory drive.

Airway: Rapid Sequence Intubation (RSI) (Continued)

Indication

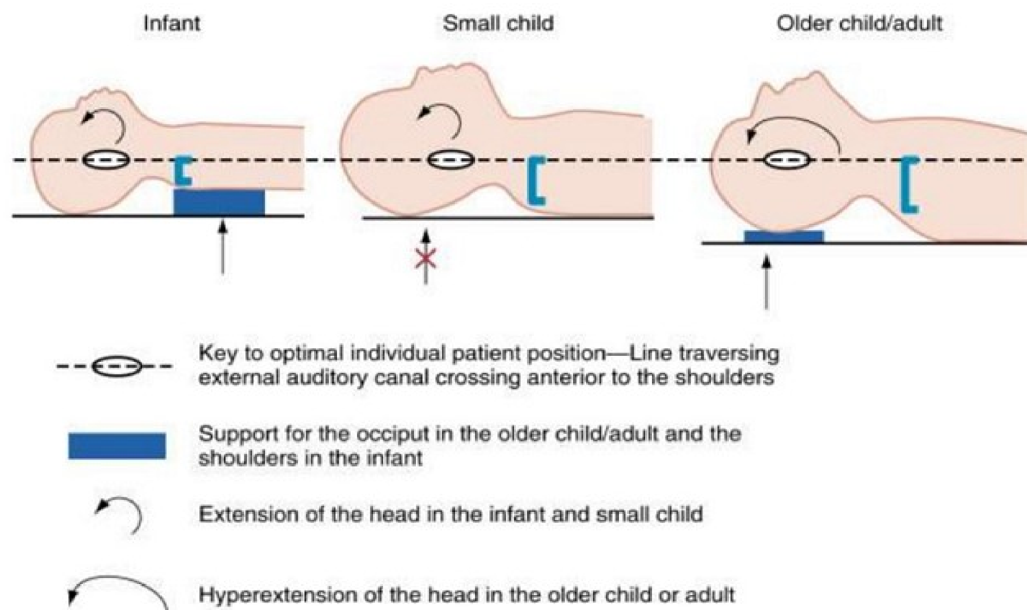
3. **Pretreatment**
   Fentanyl 2-3mcg/kg IV prior to induction agent for patients at risk for increased ICP, consider pre-treatment with Fentanyl to blunt adverse effects of laryngoscopy (increased blood pressure); withhold if pretreatment unduly delays appropriate airway control.

4. **Paralysis with Induction**
   Induction: **Etomidate** **0.3mg/kg** or **Midazolam** **0.1-0.2mg/kg** or **Ketamine** **1-2mg/kg,** wait until patient is adequately sedated prior to paralytic administration.

   Choice of induction agent: Etomidate is relatively contraindicated in severe sepsis (causes adrenal insufficiency); midazolam is not an ideal agent if patient is hypotensive or if concentration on hand is not sufficient to meet induction dosing requirements; Ketamine is a potent bronchodilator making it the preferred agent when intubation is required for COPD/asthma; Ketamine is also preferred if patient is hypotensive.

   Paralysis: **Succinylcholine** **1-2mg/kg** or **Rocuronium** **1mg/kg** if Succinylcholine is contraindicated (i.e., hyperkalemia, burns, pediatrics) or if provider/agency preference; if Succinylcholine is used, may repeat dose x1 if relaxation is inadequate.

5. **Protection / Positioning**
   Elevate head of stretcher, consider age of patient and airway anatomy for optimal positioning (illustration below); pad beneath head/shoulders to create "sniffing position", apply BURP (laryngeal manipulation) as necessary for visualization of airway anatomy.



Airway: Rapid Sequence Intubation (RSI) (Continued)

Indication

6. **Placement with Proof**
   Perform direct laryngoscopy or video laryngoscopy and place appropriately sized ET tube following **Airway: Endotracheal Intubation** protocol.

   A. If first intubation attempt is unsuccessful, re-oxygenate for at least 30-60 seconds using BVM until adequate saturation is achieved.
   B. Consider cause for unsuccessful intubation attempt(s); modify technique/address the problem; consider rescue airway (iGel).
   C. If multiple intubation attempts fail and ventilation/oxygenation cannot be achieved with manual BVM ventilation, or rescue airway; consider failed airway options; see **Airway: Surgical / Needle Cricothyrotomy** protocols as indicated.
   D. Intubation Successful: Document depth in cm at the teeth; depth should be close to 3 x the size of the ET tube (i.e., 8.0 ET tube adult = 24cm at the teeth).
   E. Primary Confirmation: Lung sounds, negative over epigastrium, mist in the tube, chest rise and fall and good compliance with ventilation.
   F. Secondary Confirmation: Monitor ETCO2 waveform capnography.

7. **Post-Intubation Management**
   Intubation and ventilation is painful provide and maintain adequate sedation AND analgesia to the patient during transport at all times, consider the following medication options:
   Short Transport Times (<20 minute): IV push/bolus dosing options
   Midazolam 2-5mg q15 minutes
   Lorazepam 2-4mg q30 minutes
   Ketamine 0.5-1mg/kg q15 minutes
   Fentanyl 1-2mcg/kg q10 minutes up to -4mcg/kg total

   Long Transport Times (>20 minutes): Consider Midazolam infusion after initial IV bolus.
   Midazolam Infusion, IV Pump ONLY; mix 10mg Midazolam in 100ml NS = 0.1mg/ml.
   - Adult <100kg: **2mg/hr**
   - Adult ≥100kg: **4mg/hr**

   If sedation is inadequate after 5-10 minutes, increase infusion by 1/mg/hr, up to a maximum infusion rate of 10mg/hr, may administer Midazolam 1-2mg IV push in between infusion titrations to ensure ventilation compliance.
   - Pediatrics: **50mcg/kg/hr** after initial IV bolus (0.05-0.1mg/kg)

   If sedation inadequate after 5-10 minutes, increase infusion by 10mcg/kg/hr, up to a maximum infusion rate of 100mcg/kg/hr, may administer Midazolam 50mcg/kg IV push in between infusion titrations to ensure ventilation compliance.
   Consider simultaneous **Fentanyl Infusion**, see **General Pain Management** protocol; to potentiate Midazolam infusion; especially for mechanically ventilated patients.

Airway: Rapid Sequence Intubation (RSI) (Continued)

Indication

Consider long term musculoskeletal paralysis for the following situations/clinical conditions:

- Multiple doses of sedation/ analgesia are ineffective
- Patient is threatening/compromising security, of the airway (ETT)
- Transport time is ≥ 20 minutes
- Long term paralysis is needed to ensure compliance with mechanical ventilator
- Paramedic's clinical judgment of benefit to the patient

Rocuronium **1mg/kg**, repeat dose at 0.5mg/kg if needed q30min, continue sedation and analgesia regimen as indicated for patient comfort, assumed pain, and compliance.

If, after ETT placement, the quality of ventilation and oxygenation worsens (desaturation, poor ventilation compliance, etc.). Assess for **"DOPE"** and troubleshoot:

D - Dislodgement of tube out of trachea, or displacement into right main stem
O - Obstruction; mucous plug, blood/emesis, requiring suction or kink in vent tubing
P - Pneumothorax; re-assess lung sounds
E - Equipment failure' tubing disconnected, oxygen regulator leak, etc.

Documentation Check List

Justification for decision to RSI, medications administered, complications, failed intubation attempts, visualization of cords and confirmation of tube placement including ETCO2.

- Airway assessment (MOANS / LEMON)
- Justification for RSI, (patient not protecting airway, predicted clinical course, etc.)
- All medication and dose administered
- Intubation complications/failed intubation attempts
- Visualization of cords and confirmation of tube placement
- ETCO2/waveform capnography
- Reconfirmation of tracheal tube placement with any patient movement

Airway: Supra-glottic Device / I-Gel

Indication

Patient is unconscious and unresponsive; may be used as primary advanced airway or rescue device when placement of ETT has failed.

Contraindications

Spontaneous respirations, intact gag reflex, facial trauma or distorted airway prevents glottic seal.

Size Chart

I-Gel Size	Patient Size	Patient Weight (Kg)	Patient Weight (lbs.)
Pink – 1	**Neonate**	**2-5**	**4-11**
Blue – 1.5	**Infant**	**5-12**	**11-26**
Gray – 2	**Small Pediatric**	**10-25**	**22-55**
White – 2.5	**Large Pediatric**	**25-35**	**55-77**
Yellow – 3	**Small Adult**	**30-60**	**66-132**
Green – 4	**Medium Adult**	**50-90**	**110-198**
Orange – 5	**Large Adult**	**90+**	**198+**

Management

Intervention Sequence

1. Select appropriate size I-Gel, reference chart above.
2. Place a small layer of water-based lubricant onto the I-Gel along the integral bite block, back, sides, and front of the cuff.
3. Inspect carefully and confirm there are no foreign bodies or large amounts of lubricant obstructing the distal opening.
4. Grasp the lubricated I-Gel firmly along the bite block (near the BVM adapter).
5. Position the device so that the I-Gel cuff outlet is facing towards the chin of the patient.
6. Place patient in the sniffing position with head extended and neck slightly hyperextended.
7. Gently press down on the patients chin to open the mouth. It is not necessary to insert fingers or thumbs into the patient's mouth during the insertion process.
8. Introduce the leading tip into the mouth of the patient in a direction towards the hard palate.
9. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until resistance is felt. Sometimes a feeling of 'give way' is felt before the end point of resistance is met, this is due to the passage of the bowl of the I-Gel through the faucial pillars. It is important to continue with insertion until definitive resistance is met. Do not repeatedly push the I-Gel down or apply excessive force.
10. The tip of the airway should now be located into the upper esophageal opening and the cuff should be located against the laryngeal framework (over the glottic opening), and the patient's teeth should be resting on the integral bite block (near the BVM adapter).
11. Apply BVM and ventilate, assess for proper placement and adjust as needed.

Airway: Mechanical Ventilation (Pneumatic Ventilator)

Indication

If time and resources permit, consider placing intubated patients on a ventilator to improve airway protection and provide better control of breathing rate, tidal volume, and overall patient comfort. If ventilator is equipped with CPR mode it may be utilized during CPR.

Management

Basic Mechanical Ventilation Setup:

1. Ensure ventilator is connected to oxygen supply
2. Set high pressure alarm to appropriate setting (35-40)
3. Select FiO2- 50% or 100% on ventilator based on patient need
4. Determine ideal (predicted) body weight based on height of patient (reference charts)
5. Select appropriate tidal volume (4-8ml/kg) based on ventilation strategy
6. Calculate minute volume: 120ml/kg/min (normal metabolism requires 60ml/kg/min, however double minute volume to account for dead space in ETT and vent tubing. Consider doubling again (240ml/kg/min) for sepsis and other hypermetabolic disease processes that require higher minute volumes due to increased oxygen demand.
7. Divide minute volume by tidal volume (reference chart below) to get respiratory rate
8. Initiate ventilation with these settings, apply PEEP valve or adjust internal PEEP if capable and titrate as necessary for oxygenation and patient response.

MALE QUICK REFERENCE FOR TIDAL VOLUME

HEIGHT	INCHES	PBW	8 mL/KG	6 mL/KG	4 mL/KG
4'6"	54	36.2	290	220	150
4'7"	55	38.5	310	230	160
4'8"	56	40.8	330	250	170
4'9"	57	43.1	350	260	170
4'10"	58	45.4	370	270	180
4'11"	59	47.7	380	290	190
5'0"	60	50.0	400	300	200
5'1"	61	52.3	420	320	210
5'2"	62	54.6	440	330	220
5'3"	63	56.9	460	340	230
5'4"	64	59.2	480	360	240
5'5"	65	61.5	490	370	250
5'6"	66	63.8	510	390	260
5'7"	67	66.1	530	400	270
5'8"	68	68.4	550	410	280
5'9"	69	70.7	570	430	290
5'10"	70	73.0	590	440	290
5'11"	71	75.3	600	450	300
6'0"	72	77.6	620	470	310
6'1"	73	79.9	640	480	320
6'2"	74	82.2	660	500	330
6'3"	75	84.5	680	510	340
6'4"	76	86.8	700	520	350

KG = kilogram; mL = milliliter; PBW = predicted body weight

FEMALE QUICK REFERENCE FOR TIDAL VOLUME

HEIGHT	INCHES	PBW	8 mL/KG	6 mL/KG	4 mL/KG
4'6"	54	31.7	260	190	130
4'7"	55	34.0	270	210	140
4'8"	56	36.3	290	220	150
4'9"	57	38.6	310	230	160
4'10"	58	40.9	330	250	170
4'11"	59	43.2	350	260	180
5'0"	60	45.5	370	280	180
5'1"	61	47.8	380	290	190
5'2"	62	50.1	400	300	200
5'3"	63	52.4	420	320	210
5'4"	64	54.7	440	330	220
5'5"	65	57.0	460	340	230
5'6"	66	59.3	480	360	240
5'7"	67	61.6	500	370	250
5'8"	68	63.9	510	390	260
5'9"	69	66.2	530	400	270
5'10"	70	68.5	550	410	280
5'11"	71	70.8	570	430	290
6'0"	72	73.1	590	440	290
6'1"	73	75.4	610	450	300
6'2"	74	77.7	620	470	310
6'3"	75	80.0	640	480	320
6'4"	76	82.3	660	500	330

KG = kilogram; mL = milliliter; PBW = predicted body weight

Airway: Surgical Cricothyrotomy

Indication

Life threatening airway collapse, including upper airway obstruction, where traditional measures to ventilate and oxygenate the patient through manual ventilation with BVM, tracheal intubation, and supra-glottic airway devices have all failed.

Contraindications

Patients under 8 years of age, use **Needle Cricothyrotomy**

Management

Preparation:

6.0 ET tube cut off just above the balloon port. (May use full size tube if needed)
Bougie
Scalpel
Trachea hook
Antiseptic swab
10ml Syringe
Suction equipment
Securing device

Intervention Sequence

1. Provide adequate sedation/pain management prior to procedure if time permits.
2. Place patient supine, hyperextend patient's neck. Be cautious in trauma patients to protect c-spine, however need for advanced airway takes precedence.
3. Have suction and supplies available and ready.
4. Locate the cricothyroid membrane utilizing anatomical landmarks.
5. Prep the area with antiseptic swab.
6. Manually stabilize the cricothyroid cartilage with thumbs and index finger.
7. Make a vertical incision in the skin approximately 2-3 cm in length straight down through the cricothyroid membrane into the trachea.
8. With scalpel still in place, slide trachea hook down beside scalpel into trachea.
9. Take control of the trachea, pulling against the weight of the body toward the patient's head and remove the scalpel.
10. Insert bougie into trachea
11. Insert a cuffed 6.0 ET tube or an appropriate sized, cuffed ET tube over the bougie.
12. Ensure the tracheal hook does not tear ET tube cuff during insertion.
13. Inflate the cuff and ventilate the patient. Leave the trachea hook in place until the tube placement is verified.
14. Auscultate for lung sounds bilaterally and for absence of epigastric sounds.
15. Place ETCO2 monitoring device on patient.
16. Secure ET tube and continue appropriate ventilation.
17. Reassess airway frequently throughout the remainder of patient care.

Airway: Needle Cricothyrotomy

Indication

Patients under 8 years of age or adults when a surgical airway is not obtainable, use needle Cricothyrotomy for passive oxygenation. Indicated for life threatening airway collapse, including upper airway obstruction, severe facial or nasal injuries, anaphylaxis, chemical inhalation injury or when other means of establishing a secure airway have failed.

Management

Preparation:

Scalpel
IV catheter, 12-16g
10ml syringe
Antiseptic solution
Sterile gloves and dressings
BVM
2-5mm ET tube adapter
Jet ventilation tubing (meconium aspirator and cut down suction tubing)

Intervention Sequence

1. Provide adequate sedation/pain management prior to procedure if time permits.
2. Place patient supine, hyperextend patient's neck. Be cautious in trauma patients to protect c-spine, however need for advanced airway takes precedence.
3. Locate the cricothyroid membrane utilizing anatomical landmarks.
4. Prep the area with antiseptic swab.
5. Manually stabilize the cricothyroid cartilage with thumbs and index finger.
6. If needed make a vertical incision through the skin approximately 0.5-1cm in length over the membrane. If an incision is not needed, skip to step 8.
7. Dab incision as needed with sterile 4x4s to control capillary oozing.
8. Insert needle with attached 10ml syringe containing saline through the midline of the membrane at a 45–60-degree angle toward the patient's chest.
9. Air will enter the syringe when the needle is in the trachea, look for bubbles.
10. Advance the catheter over the needle toward the carina, remove needle and syringe.
11. Attach 2.5-3mm ET tube adapter to the hub of the needle
12. Hold the catheter in place and attach BVM device to the ET tube adapter
13. Ventilate with BVM and 100% oxygen
14. Conform successful cannulation with normal confirmation techniques including ETCO2

Transtracheal Jet Ventilation

Optimal ventilation is achieved with transtracheal jet ventilation. Deliver ventilations at a ratio of 1:4 (1 second of oxygen/ventilation, 4 seconds to allow for passive exhalation, repeat sequence). If catheter becomes occluded, irrigate with 2ml of sterile NS. Consider placement of second catheter to aid with exhalation.

Airway: Tension Pneumothorax and Pleural Decompression

Indication

Signs and symptoms of suspected spontaneous or traumatic tension pneumothorax and procedure for pleural decompression.

Management

Assessment

Severe respiratory distress
Signs of imminent failure
Decreased lung sounds on affected side
Distended neck veins
Poor ventilation compliance (increased resistance to positive ventilation)
Asymmetrical chest rise
Shock
Patient has suffered blunt force or penetrating injury and subsequently gone into cardiac arrest

Intervention Sequence

Decision to proceed with pleural decompression has been made:

Procedure:

1. Provide adequate sedation/pain management prior to procedure if time permits.
2. Locate insertion site at 2nd intercostal space, mid clavicular line of affected side.
3. Cleanse site with antiseptic
4. Insert a 10, 12, or 14 gauge needle/catheter or an MPD approved thoracentesis device (i.e., Turkel, COOK, ARS etc.) over the superior aspect of the 3rd rib. Alternative location is 5th intercostal space mid-axillary
5. If blood is noted, consider hemothorax
6. Advance catheter over needle, observe for rush of air
7. Auscultate breath sounds and observe for immediate improvement in patient status
8. Consider adding one-way valve to the end of the catheter

Additional options to aid in placement:

Attempt to aspirate with an attached syringe as you advance
If under tension air will fill the syringe
Add 2-3 ml of Normal Saline to the syringe, giving you a visual clue that air is escaping the chest during insertion.
If no air returns and still under tension relocate and try again

Hypertension / Emergency Crisis

Indication

Hypertension not related to pregnancy with signs of end organ failure or suspected stroke.

Emergency Crisis: SBP > or equal to 200mmHg or diastolic BP > or equal to 120 mmHg and signs of end organ compromise: CHF, aortic dissection, pulmonary edema, unstable angina, changes in mental status, CNS changes, renal insufficiency / failure.

Management

Assessment

Presenting symptom may include headache, blurred vision, vertigo, or difficulty with balance, ringing in ears, or nausea and vomiting.
History of HTN or medication list indicates ACE inhibitors and beta blockers.
Consider questioning patient medication compliance
Determine clinical significance of blood pressure
Candidate for thrombolytic therapy, see **Stroke** protocol

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Establish IV access
Monitor cardiac rhythm
Transport without delay
Observe closely
TREAT THE PATIENT, NOT THE BLOOD PRESSURE

Transport Considerations

Contact Medical Control as needed

Pharmacology

Labetalol **5-10mg** IV over 2 min, repeat as indicated to achieve SBP <180 and/or relief of symptoms, contact Medical Control as needed. Overall goal in beta blocker therapy is to reduce blood pressure slowly. Contraindicated for bronchial asthma, bradycardia, hypotension

Nitroglycerin **0.4mg** SL Tab or Spray; contraindicated if SBP <90 mmHg, may be ordered by Medical Control for select cases. Never use Nitroglycerine for antihypertensive therapy if stroke is suspected.

Stroke / CVA

Indication

Positive BE-FAST scan or any neurologic deficit suggesting stroke.

Thrombolytic (TPA) therapy may be indicated for patients whose onset of symptoms is <3 hours. This protocol follows guidelines for treatment of hypertension in the setting of a stroke. Scene and transport time should be minimized as much as possible to keep patient within the thrombolytic window.

Management

Assessment

Determine patient baseline; do not dismiss family or caretaker's inability to describe what is wrong with the patient other than stating, "Something is different today."

Prehospital Stroke Scale (BE-FAST)	
Balance	Evaluate for sudden loss of balance and/or abnormalities in ability to stand/walk; any fall occurring around the time of onset of symptoms is significant
Eyes	Sudden losses of vision or trouble seeing in one or both eyes, blackened, blurred, or double vision (diplopia).
Face	Have patient show teeth, grimace or smile, look for asymmetry (uneven face, facial drooping, assess ability furrow brow
Arms	Have patient close eyes and hold arms out, look for unilateral arm drift
Speech	Speech abnormalities (slurred words, dysarthria), receptive / expressive aphasia
Time	Determine how long the symptoms have been present and when the patient was last seen normal (establish normal baseline).

Intervention Sequence

Support ABC's, oxygen for SPO2 <94%
Perform BE-FAST scan and blood glucose check
Establish vascular access, monitor cardiac rhythm
Intubate if required, see RSI protocol
Transport without delay

Transport Considerations

Consider candidate for reperfusion / thrombolytic therapy. Notify receiving facility of need for CT (stroke activation). Refer to Washington State Stroke Triage Destination Procedure, South Central Region Patient Care Procedure #5.3, Columbia County Operating Procedure #5.3, or Walla Walla County Operating Procedure #5.3. Give dextrose cautiously in lower doses to address mental status due to hyperglycemia.

Pharmacology

Labetalol **5-10mg** IV over 2 min if SBP> 190 or DSP>120; not all patients will meet this criterion but may still benefit from beta blocker therapy, repeat as indicated. The goal in beta blocker therapy in the pre-hospital setting is to begin lowering blood pressure slowly to decrease timeframe to TPA administration: **SBP180 or lower required before receiving thrombolytic drugs (TPA) in the emergency department.** Labetalol is contraindicated for bronchial asthma, bradycardia, and hypotension.

Abdominal Pain

Indication

Generalized or localized abdominal pain, acute abdomen.

Management

Assessment

Onset, Provocation, Quality, Radiation, Severity, Time (OPQRST)
1-10 Numeric Pain Scale
Consider atypical presentation of cardiac event
Observe for palpable mass
Bowel tones / silent abdomen
Ascites or history of hepatic impairment
Observe for guarding
Rebound tenderness
Distension / rigidity
Discoloration / signs of internal bleeding
Rash or signs of underlying infection
Previous episodes or exacerbation of chronic condition
Last menstrual period
Possibility of pregnancy

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Focused abdominal exam
Establish IV access, large bore if hypovolemia suspected
Monitor cardiac rhythm
Consider pain control; be cautious of blood pressure (Nitrous is contraindicated)
Treat nausea and vomiting as indicated, see **Nausea / Vomiting** protocol
Transport without delay and monitor closely

Transport Considerations

Position of comfort is most appropriate
Hypovolemia /shock, see **Shock** protocol
Be aware that cardiac ischemia can present as abdominal pain especially in the elderly.

Pharmacology

Fentanyl **0.5-1mcg/kg**, may repeat up to 3mcg/kg as needed for continued pain, monitor respiratory drive and vital signs, and withhold further dosing if patient develops hypotension or adverse side effects.
Pediatrics: 1mcg/kg, consult Medical Control for further dosing if indicated

Nausea / Vomiting

Indication

Nausea and/or vomiting, motion sickness.

Management

Assessment

Duration
Provocation
Quantity
Color, blood tinge
Esophageal varices
Cyclic vomiting syndrome
Question marijuana use

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Treat hypovolemia/shock as indicated, see **Shock** protocol
Monitor cardiac rhythm
Transport without delay
Observe closely

Transport Considerations

PPE / BSI for crews
Position of comfort is most appropriate
Contact Medical Control as needed

Pharmacology

Ondansetron 4mg IV/IM/IO/ODT (oral disintegrating tablet)
May repeat dose x1 for continued symptoms, **8mg max.**
Pediatrics: Children <12 years old or <40kg, 0.1mg/kg, consult with Medical Control.

Long transport times with intractable nausea and vomiting unresponsive to Ondansetron, may consider additional antiemetic therapy and mild sedation for adults; start with small doses and titrate to effect:

Diphenhydramine 12.5mg-25mg (max)

Lorazepam 0.5-2mg

Midazolam 1-2mg

Seizure / Convulsions

Indication

Seizures / convulsions of any type; **Generalized seizures:** tonic-clonic/grand mal, atonic, myoclonic; **Focal/Partial seizures:** simple, complex, clonic, tonic, absence/petit-mal.

Management

Assessment

Duration and description of seizure activity
Trauma secondary to seizure or fall
Postictal status often with the presence of incontinence
History of seizure disorder and medication compliance
Concurrent illness / febrile seizure
Drug or alcohol withdrawal symptoms mistaken as seizures (severe tremors)
CIWA (Clinical Institute for Withdrawal Assessment)

Intervention Sequence

Support ABC's and apply oxygen for SPO2 <94%, utilize suction/NPA/OPA as indicated
Protect patient from self-inflicted trauma during seizure
Establish IV access and check blood glucose; see **Hypo**/**Hyperglycemia** protocol
RSI as indicated for status seizure unresponsive to benzodiazepines

Transport Considerations

Patients experiencing seizures lasting greater than 5 minutes, having reoccurring seizures or experiencing new onset of seizure without prior history SHOULD BE TRANSPORTED
Position of comfort is most appropriate
Remove excess clothing of febrile patients

Pharmacology

Actively seizing and no IV established:
Midazolam **5-10mg** intra-nasal (mucosal atomizer)
Lorazepam **2mg** IM or **Midazolam** **5mg** IM if intra-nasal ineffective or IM chosen as first route
Pediatric: **Midazolam** **0.2mg/kg** IM, IN or **Lorazepam** **0.1mg/kg** rectally, IM, IN, or IO

IV established:
Lorazepam **1-4mg**
Pediatric: **Lorazepam** **0.1mg/kg**
May repeat dosing up to 10mg if seizure persists (status epilepticus) or move to different benzodiazepine (Midazolam), consult Medical Control as needed.

Magnesium Sulfate **1-4g** for seizures are secondary to eclampsia, consult Medical Control if SBP>160 or DBP>110 or if complicated pregnancy or seizures persist despite treatment.

Acetaminophen **20mg/kg** rectal suppository for pediatric seizures associated with fever >103, explain all interventions appropriately to parents/legal guardians.

Psychiatric / Behavioral Disorders

Indication

Mentally unstable patients who exhibit signs of potential harm to themselves or others; patients with suicidal thoughts or actions.

Management

Assessment

Consider causes of behavior history
Catatonia / Flat affect
Delusions / Hallucinations
Speech patterns / Suicidal ideation
Level of cooperation / appropriateness of answers
Do not dismiss medical complaints from patients with a psychiatric disorder

Intervention Sequence

SCENE SAFETY- PROTECT YOURSELF AND YOUR CREW
If the patient is a danger to self or others, request CRT evaluation

Suicidal Thoughts or Actions:

Do not leave patient alone
Remove any dangerous objects
Verbal coaching and encouragement of the patient to seek help is often difficult, remember patient advocacy and compassion.

Violent Patients:

Consider your own safety and limitations of the situation
Patients judged as unsafe for transport should be sedated
Restrain in lateral recumbent position or supine as needed
Extreme cases of excited delirium such as patients on PCP may result in cardiac arrest
Physical restraint and chemical restraint are ideally done simultaneously
Never leave a psychiatric patient alone or insert yourself in a threatening situation
Request law enforcement assistance as needed for all violent patients
Utilize soft restraints, spit hoods, and law enforcement as needed

Pharmacology

Lorazepam **1-4mg** IM/IN, consider other therapies if no positive change.
Midazolam **2-10mg** IM/IN, utilize in conjunction with Haloperidol as needed.
Haloperidol **2.5-5mg** IM only, up to 10mg, drug of choice for a patient with known schizophrenia or other psychotic disorder, onset is slow, approximately 10-20minutes.
Ketamine **1-2mg/kg** deep IM, preferably in large muscle such as hip/buttocks, up to 4mg/kg, contraindicated in schizophrenia, typical dosing for adult is 250mg x2 (max 500mg).

Special Considerations

Suicidal patients must be transported to definitive care; this could mean the ER or an alternate destination per the **Transport to Alternate Destinations** protocol. Contact Medical Control as needed.

Transport orders written by a county mental health professional must accompany patient.
Emergencies arising during out of area transports will be treated according to protocols.

Restraints may be used during transports but must be checked and documented every 10 minutes to ensure circulation is not compromised.

Physical Restraint

Indication

Violent, agitated, combative, or excited delirium patients whose behavior requires immediate physical restraint in order to establish and maintain patient and provider safety.

Management

Assessment

Controlling the patient and provider safety takes precedence over any other intervention.
Support ABC's as best as possible.

If the scene becomes unsecure and you can leave, back out and wait for law enforcement. If for some reason backing out is not an option or your way out of the scene is obstructed, restraints may be deployed.

Intervention Sequence

Deploy restraints as quickly as possible.
Coordinate efforts with multiple responders on scene to improve overall safety and efficiency of restraint process.
Consider chemical restraint in conjunction with physical restraint, see **Behavioral / Psychiatric** protocol.
Once control of the patient has been accomplished switch over to soft restraints, especially if patient is to be transported on the stretcher and if transport time is long.

Transport Considerations

Circulation must be checked every 10 minutes and documented.
If the patient is chemically or physically restrained ventilations should be assessed every 5 minutes or if possible, continuously monitored electronically.
In situations where the patient is under arrest and handcuffs are applied by law enforcement:

The patient will not be cuffed to the stretcher
A law enforcement officer shall accompany the patient in the ambulance if the handcuffs are to remain applied
A law enforcement officer may elect to follow the ambulance in the patrol car if the patient has been restrained with restrains other than handcuffs

Hypotension / Shock

Indication

Hypotension with signs and symptoms of shock.
Post ROSC BP < 90

Management

Assessment

Decreased LOC/GCS
HR> 110 bpm, SBP<90 mmHg
Delayed capillary refill or cool/moist skin

Shock Type	Etiology of Shock / Reference Protocol
Cardiogenic	Observe for signs symptoms of heart failure; see **CHF / Acute Pulmonary Edema** protocol, history of cardiac surgery, renal disease, rhythm disturbances, post cardiac arrest, acute MI, shortness of breath/dyspnea, lung sounds present with crackles, JVD, hypo/hypertension (acute vs. chronic), tachycardia, diaphoresis.
Distributive	Acute anaphylaxis, neurogenic shock (CNS/spinal cord injury), aggressively treat hypotension and maintain cerebral perfusion as indicated, observe for signs and symptoms of infection; see **Sepsis / SIRS** protocol.
Hypovolemic	Extreme thirst, vomiting, diarrhea, or suspected blood loss. Hypotension with tachycardia (if not on beta blockers), diaphoresis, cool/pale skin, flat neck veins/poor skin turgor, dry mucous membranes, consider permissive hypotension if signs and symptoms related to traumatic blood loss (PHTLS), refer to **Trauma: Hemorrhagic Shock** protocol.
Obstructive	Tension pneumothorax, observe for asymmetrical chest (hyperinflation on one side) or absent unilateral breath sounds, respiratory distress or hypoxia, signs of shock including tachycardia and hypotension, JVD, possible tracheal deviation above the sternal notch (late sign), also consider cardiac tamponade and pulmonary embolism (PE); observe for S1Q3T3 pattern on ECG.

Pharmacology

ROSC patients give Push Dose Epinephrine immediately for BP < 90 as a bridge to Norepinephrine.
Fluid challenge: 20-30ml/kg for SBP<90, repeat as indicated.
Pediatrics: 20ml/kg

Push Dose Epinephrine (Epi 1:100,000): 20mcg every 2 minutes as needed to maintain BP > 90 or until Norepinephrine or Epinephrine drip is infusing with desired effects.

SBP<90 mmHg despite adequate fluid resuscitation
Norepinephrine **2-4mcg/min**, titrate infusion to SBP>90, **up to 30mcg/min**, deliver via IV pump if available, however -drip (60gtt) IV tubing may be used, titrate slowly as Norepinephrine is a potent vasopressor. Blood pressure should be taken with every titration in drip rate.

Epinephrine infusion as indicated, see Allergic Reaction / Anaphylaxis protocol.

Sepsis / SIRS

Indication

Identification and management of patients with underlying infection with systemic inflammatory response syndrome (SIRS) or full sepsis/shock.

Management

Assessment

Identification – If **2 or more** of the following criteria are met, suspect developing SEPSIS, and treat accordingly (activate **SEPSIS ALERT**) if destination/local area has this capability/protocol:

1. **Suspected or known source of infection**
2. **Hypotension**: SBP<90 or mean arterial pressure (MAP) <65.
3. **Tachycardia**: Sustained HR>90
4. **Tachypnea**: Increased work of breathing or RR>20
5. **Temperature**: considered significant finding suggestive of underlying infection if <96.8F or 100.4F or greater.
6. **New onset altered mental status** or increasing mental status changes with previously altered mental status.
7. **Serum lactate level >4** (if lab values available)
8. **ETCO2 25mmHg** or lower.

Intervention Sequence

Standard PPE, especially masks (preferably worn by providers and the patient)
Definitive prehospital care is rapid identification, intervention, and transport for antibiotics.

Pharmacology

Fluid challenge: 20-30ml/kg for SBP<90, repeat as indicated.
Pediatrics: 20ml/kg

If patient is hemodynamically unstable consider **Push Dose Epinephrine (Epi 1:100,000)**, 20mcg every 2 minutes as needed to maintain BP > 90 or until Norepinephrine or Epinephrine drip is infusing with desired effects.

If SBP<90 mmHg, MAP<65, or age-appropriate hypotension after fluid challenge:
Norepinephrine **2-4mcg/min**, titrate infusion to SBP>90, **up to 30mcg/min**, deliver via IV pump if available, however -drip (60gtt) IV tubing may be used, titrate slowly as Norepinephrine is a potent vasopressor. Blood pressure should be taken with every titration in drip rate.

If patient requires substantial volume replacement (>20ml/kg) AND vasopressor for continued hypotension/inadequate end organ perfusion (MAP<65), AND meets sepsis identification criteria above, may also administer:
Methylprednisolone **125mg**
Pediatrics: 1-2mg/kg IV up to a max of 125mg.

Documentation

Mean arterial pressure (MAP) should be documented in any case where suspected infection/SEPSIS is causing hemodynamic instability, a MAP<65 considered inadequate organ perfusion.

Normal MAP: 65-110mmHg. MAP Calculation: SBP + 2(DBP) divided by 3

Vaginal Bleeding

Indication

Vaginal bleeding of any cause.

Management

Assessment

Trauma or sexual assault involved
Placenta abruption (may be dark in color with severe pain)
Placenta Previa (bright red blood and usually painless)
Spontaneous miscarriage
Ectopic pregnancy
Uterine fibroids
Rupture of ovarian cyst

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
SBP <90, see **Shock** protocol
Establish large bore IV access
Keep patient warm
Transport without delay

Pharmacology

Fluid challenge: 20-30ml/kg for SBP<90, repeat as indicated.

Tranexamic Acid (TXA) **1g** IV, IO mixed in 100 or 250ml bag of NS or D5W administered over 10 minutes, preferably via IV pump if available.

Transport Considerations

Contact Medical Control without delay
If bleeding is associated with childbirth, see **Active Labor** **and** **Hemorrhagic Shock** protocols
Preserve tissue fragments (if possible)

Documentation Considerations

Estimated blood loss
Presence of tissue
Color of blood
Gravid / Para
Last menstrual period
Possibility of trauma or assault

Active Labor: Assisting Delivery

Indication

Active labor with precipitous delivery.

Management

Assessment

Previous vaginal births or C-sections
Prenatal care received
Complications with pregnancy
Frequency of contractions
Fetal heart tones
Edema or hypertension

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
SBP< or equal to 90 mmHg, see **Shock** protocol
Establish large bore IV access
Keep patient warm

Active Labor without Crowning:

1. Left lateral position
2. Transport without delay

Active Labor with Crowning:

1. Prepare for immediate delivery on scene if delivery is imminent
2. Open OB kit and don PPE
3. Control delivery and support head with rotation
4. If cord is wrapped around neck, slip cord over head and shoulder, if unable clamp cord 2 inches apart and cut cord.
5. As head delivers, bulb suction mouth and nares
6. Guide head upward to deliver lower shoulder, then downward to deliver upper shoulder.
7. Control delivery of trunk and legs, do not drop baby.
8. Bulb suction mouth and nose again.

Active Labor with Abnormal Presentation:

1. Contact Medical Control without delay
2. Foot, hand, or cord presentation: elevate hips, place mother in knee-chest position or extreme Trendelenburg position.
3. Buttocks breech, support legs and trunk.
4. Arms before head, lower body to help head pass, as hairline appears, raise body by ankles upward and the shoulder should deliver.
5. Prevent cord compression by gently lifting head and body off cord with gloved hand, observe cord for pulsations.
6. If delivery is delayed and baby is attempting to breath, form a V with your fingers to hold vaginal wall away from baby's face.

Active Labor: Post-Partum Care

Indication

Post-partum care for newborn. All providers will follow current Neonatal Resuscitation protocols (NRP or equivalent (i.e., STABLE program). See algorithm for resuscitation as indicated for cardio-pulmonary arrest in the newborn.

Management

Assessment

Normal fetal heart rate: 120-160
Assess **APGAR** score at 1 and 5 minutes post-delivery

Indicator		0 Points	1 Point	2 Points
A	Activity (muscle tone)	Absent	Flexed arms or legs	Active
P	Pulse	Absent	< 100	> 100
G	Grimace (reflex irritability)	Floppy	Minimal response to stimulation	Quick response to stimulation
A	Appearance (skin color)	Blue, pale, cyanotic	Pink centrally, blue peripherally	Pink and healthy (head to toe)
R	Respiration	Absent	Slow and irregular	Vigorous and strong cry

Intervention Sequence

Suction mouth, nares, and then clamp and cut cord, support ABC's of mother and baby
Warm, dry, and stimulate baby. Assess for cry, meconium, and acrocyanosis.
See NRP algorithm for resuscitation as indicated for cardio-pulmonary arrest in the newborn
Note exact time of birth
Transport without delay
Massage fundus of mother
Place baby to breast to promote placental delivery
Active bleeding during delivery >250ml:
Adult fluid challenge: 20-30ml/kg IV, consider second line
Contact Medical Control without delay

Pharmacology

Contact Medical Control for all cases involving significant/uncontrolled vaginal hemorrhage, request orders for the following medications and further care, (Emergency department may transfer you to consult with OB specialist in the hospital):

Oxytocin **10Units** IM injection followed by continuous infusion: 10Units placed in 1000ml NS, run at TKO with standard (10gtt) tubing (10milliunits/min) or via IV pump if available.

Tranexamic Acid (TXA) **1g** IV, IO mixed in 100 or 250ml bag of NS or D5W administered over 10 minutes, preferably via IV pump if available.

Active Labor: Post-Partum Care (Continued)

Indication

Post-partum care for newborn. All providers will follow current Neonatal Resuscitation protocols (NRP or equivalent (STABLE program). See algorithm for resuscitation as indicated for cardio-pulmonary arrest in the newborn.

Management

Utilize the following **STABLE** chart to guide continued care following delivery or resuscitation of any newborn patient **(0-28 days old)**, assess and treat appropriately, utilize Medical Control as needed.

Indicator (STABLE)		Treatment / Pharmacology
S	Sugar/Safety	IF blood sugar is **<50** in newborn, administer **2ml/kg Dextrose 10%** slow IV/IO push. Recheck sugar in 10 minutes. Repeat dose if blood sugar is still **<50 and contact MCC.** IF prolonged transport and IV pump available, start Dextrose 10% maintenance infusion via IV pump at **80ml/kg/hr.** Do not use any concentration higher than 10% as this may cause hydrocephalus.
T	Temperature Control	Maintain warmth of newborn, utilize skin-to-skin contact with mother if newborn is healthy; if condition of newborn is “sick” and/or requires ongoing interventions, utilize thermal mattress, insulated hot packs, plastic wrap/blanket etc. as necessary.
A	Airway	Cuffed ET Tube (preferred over Uncuffed): Age/4+3. Positive Pressure: 1 breath every 2-3 seconds. Provide ONLY enough tidal volume to produce observable chest rise, allow for complete exhalation between breaths.
B	Blood Pressure	10ml/kg/ fluid bolus Umbilical venous access (UVC) (16-18gauge) Butterfly catheters for peripheral/scalp vein access (21-25 gauge) Evaluate skin color, monitor for changes
L	Lab Work	Limited for pre-hospital analysis, protect patient from exposure to sources of infection as much as possible. Identify and treat neonatal sepsis.
E	Emotional Support	Assign crewmember(s) to provide support and assistance to the family to cope with the stress of the situation, especially newborns requiring advanced interventions/resuscitation/transport.

Documentation / Communication

Closed loop communication during any newborn resuscitation
Utilize Medical Control as needed for any assistance/guidance with patient care
Report oxygen flow rate required during transport to maintain adequate Sp02 saturation

Altered Mental Status

Indication

Unresponsive patients with decreased level of consciousness of known or unknown cause.

Management

Assessment

Decreased AVPU/ LOC/GCS
Unusual odors on breath (alcohol, ketoacidosis)
Observe patient for medic-alert tags, needle track marks, evidence of trauma
Observe environment for signs of overdose
Consider postictal state from seizure
Check pupils for reactivity, equality, and size

Consider ALL possible causes of altered mental status: **(AEIOU/TIPS)**
(Also consider causes not listed):

Alcohol, acidosis, arrhythmias
Epilepsy, endocrine, environmental, electrolytes
Infection (sepsis/sirs)
Overdose, opiates, oxygen (hypoxia)
Uremia (toxemia, renal disease)
Trauma, tumor
Insulin, (hypo/hyperglycemia)
Psychosis, poisoning
Stroke, seizure, syncope

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Cardiac monitor, follow ACLS algorithms as indicated
Blood glucose check; see **Hypo**/**Hyperglycemia** protocol as indicated
SBP <90, see **Shock** protocol
Consider Naloxone if unresponsive with respiratory depression and suspected opiate overdose, see **Overdose: Sedatives/Hypnotics** protocol

Transport Considerations

Keep patient warm
Consider flash pulmonary edema with Naloxone administration in opiate dependent patients, be prepared to restrain combative patients, see **Restraint** protocol

Documentation considerations

Glasgow Coma Scale, pupil size and reactivity
Clinical response to dextrose or Naloxone
Signs of drug use or trauma

Adrenal Insufficiency/Crisis

Indication

Identification and management of patients with acute or chronic adrenal insufficiency.

Management

Assessment

Adrenal insufficiency results when the body (adrenal glands) does not produce the essential life-sustaining hormones cortisol and aldosterone, which are vital to maintaining blood pressure, cardiac contractility, water, and salt balance. Chronic adrenal insufficiency can be caused by several conditions:

1. Congenital or acquired disorders of the adrenal gland (Addison's disease).
2. Regular use of steroids (COPD, asthma, rheumatoid arthritis, and transplant patients).
3. Acute adrenal insufficiency can result in refractory shock or death in patients currently on a maintenance dose of a steroid who experience illness or trauma and are not given a "stress dose", and as necessary, supplemental doses of steroids.

A "stress dose" of steroids is a supplemental dose given to patients with known chronic adrenal insufficiency and has the following illnesses/injuries:

1. Altered mental status
2. Shock (any cause, except for cardiogenic shock/heart failure).
3. Fever 100.4°F or greater and appears sick.
4. Multi-system trauma.
5. Drowning.
6. Environmental hyperthermia or hypothermia.
7. Multiple long-bone fractures.
8. Vomiting/diarrhea accompanied by dehydration.
9. Respiratory distress or sustained tachycardia
10. Severe burns, 2nd or 3rd degree >5% BSA
11. Hypoglycemia

Pharmacology

If patient has known history of adrenal insufficiency, AND presents with severe signs and symptoms as described above, treat symptomatically, and consider:

Fluid challenge: 20-30ml/kg for SBP<90, repeat as indicated.
Pediatrics: 20ml/kg

Methylprednisolone **125mg**
Pediatrics: 1-2mg/kg IV up to a max of 125mg.

Syncope

Indication

Syncope with collapse, unconsciousness with or without return of consciousness.

Management

Assessment

Witnessed or unwitnessed
LOC/GCS
History of anxiety
Respiratory rate, hyperventilation, carpal-pedal spasms
Diabetic/blood glucose
Cardiac, ECG interpretation
Vasovagal response
Hypovolemia
Vasodilatation
Arrhythmias
Fatigue
Heart Disease
Heat Stroke / environmental factors

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Consider taking orthostatic vital signs
Identify and correct reversible causes
Arrhythmias present, follow appropriate ACLS protocol
SBP< or equal to 90mmHg, see **Shock** protocol
SBP> 90mmHg supportive measures

Transport Considerations

Patient in position of comfort
Monitor cardiac rhythm
Monitor LOC for changes
Keep patient warm

Documentation Considerations

Activity prior to change in LOC
Seizure activity
Medications and recent changes in medications
Drug use
Hyperventilation syndrome

Hyperkalemia

Indication

Management of suspected or known hyperkalemia with severe signs and symptoms of cardiovascular impairment.

Management

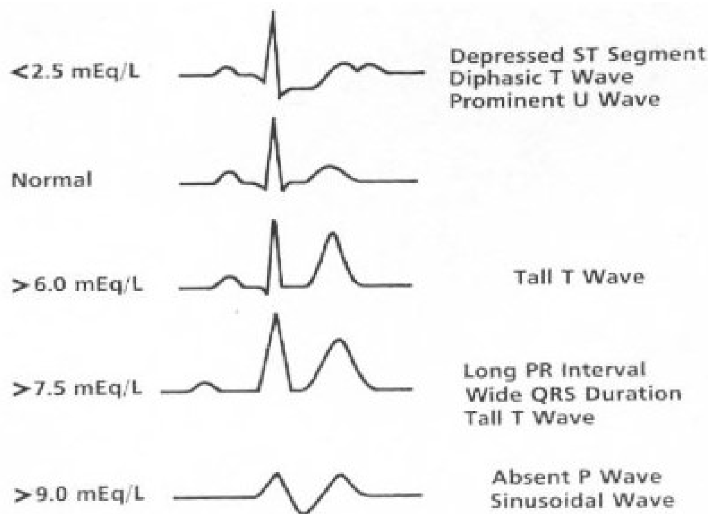
Assessment

Predisposing factors for hyperkalemia:

Chronic or acute renal failure (dehydration, shock, nephrotoxins, obstruction, etc.)
Weekly hemodialysis, crush injury/compartment syndrome; electrophysiological effects of hyperkalemia are proportional to both the potassium level and its rate of increase.

High serum potassium levels disrupts the appropriate balance across the cellular membrane of the myocardium and in toxic levels will suppress and impair electrical activity in the heart.

Serum Potassium ECG Changes:



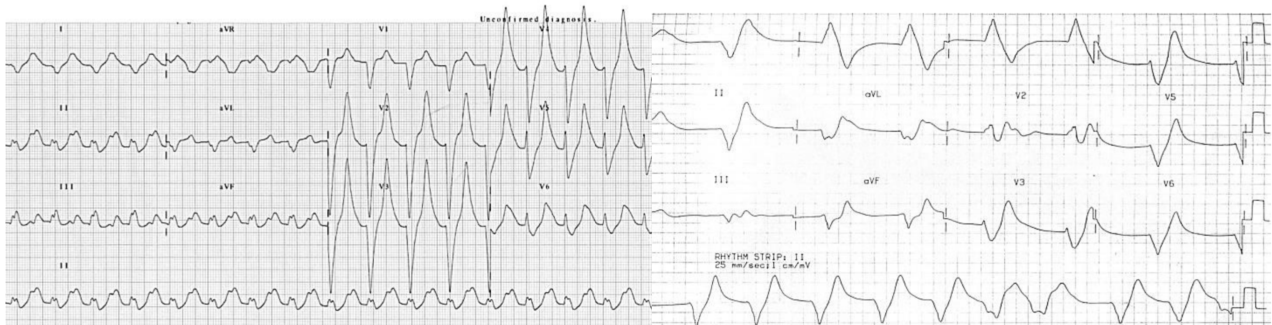
Mild (5.5-6.5 mEq/L) Peaked T waves, increased PR interval, decreases in P wave amplitude.

Moderate (6.5-8.0 mEq/L) Loss of P waves, widening QRS (>120ms), ST segment elevation, ectopic beats, and escape rhythms.

Severe (>8.0 mEq/L) Profound widening of QRS (often >240ms), evidence of "sine wave", axis deviation, bundle branch blocks, fascicular blocks, often leads to cardiac arrest (ventricular fibrillation) if left untreated.

ECG Examples of Severe Hyper-K:

Potassium 9.3mEq/L Potassium 9.9mEq/L "Sine Wave"



Hyperkalemia

Management – Continued

Intervention Sequence

Support ABC's, oxygen for SPO2 <94%
Monitor cardiac rhythm and expedite transport

Pharmacology

If patient presents as hemodynamically unstable, AND personal history predisposing patient to hyperkalemia, AND 12 lead ECG findings are consistent with moderate to severe hyperkalemia, consult Medical Control and consider the following medications:

Calcium **10% Injection 1-2g slow IV push, (ideally infused over 3-5 minutes)** may use calcium chloride or calcium gluconate depending on manufacturer availability and/or agency preference.

Sodium Bicarbonate **1mEq/kg** for treatment of assumed state of metabolic acidosis, do not mix with Calcium chloride, flush IV line of calcium thoroughly before administering.

Albuterol Sulfate **2.5mg nebulized** with 6-8 L/oxygen, Medical Control may order continuous albuterol treatment for duration of transport (up to a max dose of 20mg).

If patient is being transferred from one facility to another for ongoing treatment and/or hemodialysis, the sending facility may authorize additional medications to be administered in route including continuous insulin and Dextrose infusions.

Home Hemodialysis Patients

Some patients are now doing UNATTENDED home hemodialysis. In the event EMS is called to a patient who is unable to disconnect themselves from the machine, and no one else is available to assist with disconnecting the patient, perform the following steps to disconnect the patient from the machine for transport:

1. Push the **STOP** button on the front of the machine and unplug the machine's power cord.
2. Identify and close the 4 clamps on the tubing. If clamps are not on the tubing, use Kelly clamps or plastic clamps (which will usually be on or near the dialysis machine) to clamp off the 2 tubes both above and below the Luer lock disconnects.
3. If you are trained to do so, and you have sterile caps or sterile syringes, or they are on or near the dialysis machine, then swab each disconnect end-connector with alcohol and attach the cap or syringe.
4. You will now have two needle-tubing pieces still inserted into the patient's fistula. GENTLY tape the tubing to the patient's arm, and then LOOSELY wrap gauze around the arm. DO NOT apply a pressure dressing.
5. **If you accidentally pull a needle out of the fistula you will have to apply firm manual pressure (again, NOT a pressure dressing) to that bleeding point for 20 minutes.**

Hypoglycemia

Indication

Patients with a decreased LOC secondary to a low blood sugar

Management

Assessment

Altered LOC, Weakness, fatigue, or stroke-like symptoms
Tachycardia, profound diaphoresis
Known history of insulin dependent or diet-controlled diabetes.
Pregnancy, consider gestational diabetes
Blood glucose less than or equal to 60 mg/dL in adults is considered low and is likely to cause serious signs and symptoms requiring intervention.

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Blood glucose check and vital signs
Monitor cardiac rhythm
Treat hypoglycemia if indicated by signs and symptoms

Transport Considerations

It may be indicated to transport patients who are not sure why their glucose dropped to a level that required EMS intervention. Inability to explain the episode indicates a need for evaluation.

Pharmacology

If patient is alert enough to swallow and manage their own airway and follow commands, administer oral glucose or a sugar containing drink, encourage patient to eat carbohydrate and protein containing food to sustain blood sugar and support normalization.

IV established with patient **NOT ALERT** and oral glucose contraindicated:
Dextrose **50% - 25g** IV, IO or Dextrose **10%,** up to 250ml (25g dose); may repeat dose after 10 minutes if patient remains altered with glucose reading <70.

Pediatric: Dextrose **0.5-1g/kg** IV, IO up to 25g
Neonate: 2ml/kg Dextrose 10%
1 month – 8-years-old: 5-10ml/kg Dextrose 10% or **2-4ml/kg** Dextrose 25%
>8-year-old use 50% concentration
IV not established:
Glucagon **1mg** IM; if no improvement with Glucagon, consider Dextrose **50% -25g** IO route.

Documentation

Dosing recommended by height/weight (Broselow tape)
Blood glucose before and after treatment
Compliance with insulin regimen.
Recommendations to follow up with their doctor for education

Hyperglycemia

Indication

Patients with signs and symptoms of hyperglycemia.

Management

Assessment

Altered LOC
Fruity odor on breath (ketones)
May mask or be mistaken as ETOH intoxication
Irregular or deep breathing (Kussmaul pattern)
Visual disturbances
Seizure activity
Weakness, fatigue
Tachycardia, tachypnea
Intractable nausea and vomiting
Polyuria, polyphagia, polydipsia
Known history of insulin dependent diabetes
Poor compliance with insulin administration
Consider HHNS (Type 2 diabetes complication, glucose levels often >600mg/dL.)
Peripheral vascular disease
Diabetic neuropathy
Renal disease
Diabetic ulcers leading to sepsis/ amputation

Intervention Sequence

ABC's, support ventilation as necessary
Blood glucose check and vital signs
If patient is not alert, establish IV access
Monitor cardiac rhythm
Treat symptomatically; see **Nausea / Vomiting** protocol
Transport without delay

Pharmacology

If patient exhibits signs and symptoms of hypovolemia or ketoacidosis, consider aggressive fluid resuscitation. **Blood glucose levels >400mg/dL, consider second large bore IV line or single large bore line on pressure bag.**

Fluid challenge: 20-30ml/kg, monitor for improvement.
Pediatric: 20ml/kg.

Hypothermia

Indication

Prolonged exposure to cold weather with associated signs and symptoms of hypothermia.

Management

Assessment

Duration and nature of exposure
Mechanisms of heat loss
Decreased LOC/GCS, altered mental status, confusion
Fatigue
Skin color changes: cyanosis or mottling
Core body temperature

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Take body temperature
Keep patient warm and offer reassurance
Actively rewarm until core body temperature > 35 degrees Celsius / 95 degrees Fahrenheit, may consider using hot packs, multiple blankets, and radiant heat sources such as warming beds and use high heat in patient compartment ambulance heating system.
Intubate if required, see **RSI** protocol

For cardiac arrest, determine core body temperature measurement during resuscitation:

<30 degrees Celsius / 86 degrees Fahrenheit: Limit to 3 shocks, actively rewarm, and withhold ACLS medications.
>30 degrees Celsius / 86 degrees Fahrenheit: Continue ACLS with unlimited shocks

Transport Considerations

Consider need for transport to trauma center if trauma is a component of the incident, such as a vehicle rollover into a cold body of water.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1.**

Pharmacology

Consider warmed IV fluid challenge 20-30ml/kg, IV fluid should be at least 43 degrees Celsius
Pediatric: 20ml/kg.

Hyperthermia

Indication

Patients with an elevated body temperature, suspected heat exhaustion or heat stroke causing serious signs and symptoms.

Management

Assessment

Duration and nature of exposure
Decreased LOC/GCS, altered mental status, confusion
Fatigue
Skin color changes: flushing, red
Diaphoresis or dry hot skin
Core body temperature

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Move patient to cool environment (shade, air-conditioned house, cool ambulance)
Take off any excess clothing
Take body temperature (normal temp is 98.6 F/ 35 C)

Cooling Measures:

Apply moist dressings
Apply cool packs to arm pits and groin
If available spray down patient with mist and fan to cause evaporation and cooling
SBP<90, see **Shock** protocol
Establish IV access
Blood glucose check
Monitor cardiac rhythm follow ACLS as indicated
Transport without delay
Monitor patient's response to IV fluids closely. BP will usually return to normal quickly.

Transport Considerations

Guard against lowering body temperature too low so as to cause the patient to shiver. Be prepared for seizure activity and otherwise treat symptomatically.

Pharmacology

Consider cooled IV fluid challenge 20-30ml/kg. Do not overload patient with IV fluids.
Pediatric: 20ml/kg.

Special Considerations

If responding to a school sponsored athletic event where an Athletic Trainer has the patient in either a cold-water immersion tub or the trainer is using the tarp-assisted cooling with oscillation (TACO) method to cool the patient, ALS may stay on scene and work with the trainer to reduce the patient's temperature, if in the Paramedic's clinical judgment this will benefit the patient.

Overdose and Poisoning

Indication

General management of patients with confirmed or suspected overdose and poisoning.

Management

Assessment

Internal Contamination:

Substance ingested
Time of consumption
Amount consumed

External Contamination:

What was the patient exposed to?
Chemical burns?
Contact with mucous membranes, mouth, or eyes?
Consider contraindications for flushing with water due to possible reaction:
(Not limited to this list)

1. Phosphorus
2. Sodium metal
3. Phenol
4. Hydrochloric acid
5. Sulfuric acid
6. Ammonia
7. Hydrogen cyanide

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Remove contaminated clothing
Gross DECON of patient
Flush contaminated skin and eyes with copious amounts of water
If patient is not alert, see **Altered Mental Status** protocol and/or appropriate overdose protocol
Intubate if required, see **RSI** protocol
Transport without delay, ensuring not to bring contaminant into the ambulance or hospital. Take photos of substances as necessary.

Special Considerations

Contact Poison Control: 1-888-222-1222

If time permits, providers may contact poison control while enroute to the incident and request patient care recommendations based on dispatch information.
Request HAZ-MAT response if indicated, notify hospital of HAZ-MAT activation without delay.
Contact Medical Control as indicated for additional management recommendations and specific treatments.

Overdose: Carbon Monoxide Poisoning

Indication

Prolonged exposure to carbon monoxide with or without signs and symptoms.

Management

Assessment

Duration and nature of exposure
Decreased LOC/GCS, altered mental status, confusion
Mild headache, CNS disturbances
Dyspnea/respiratory failure
Fatigue
Nausea and/or vomiting
Ataxia
Syncope
Seizures
Incontinence
Skin color may be bright red

Intervention Sequence

ABC's and supportive care
Oxygen - HIGH FLOW 15L/min NRB mask
Establish IV access
Monitor cardiac rhythm
If cardiac monitor equipped with CO probe, consider obtaining PPM reading
Shield SPO2 and CO probes from light for most accurate readings
Transport without delay
Observe closely for signs of deterioration
Treat symptomatically
Intubate if required, see RSI protocol

Special Considerations

Do not expose crews to CO
Position patient to facilitate breathing
Consider air transport if indicated
Notify receiving hospital of possible need for hyperbaric chamber
Carboxyhemoglobin levels of 15-40% will usually show variable signs and symptoms of mild to moderate severity. Carboxyhemoglobin levels >40% usually leave the patient significantly altered and in severe distress.

REMEMBER- SPO2 monitors do not distinguish Carbon Monoxide (CO) from oxygen. A patient with carboxyhemoglobin levels of >20%, the best possible TRUE SpO2 will be 80% (as 20% of the hemi-receptor sites are bound by CO) and yet cardiac monitors will read 100%. Use CO probe monitor has this capability and if indicated.

Overdose: Sedatives / Hypnotics

Indication

General management of suspected or confirmed overdose of sedatives.

Management

Assessment

Opiate / Narcotic Overdose:

CNS & respiratory depression
Drowsiness
Nausea / Vomiting
Pinpoint pupils
Coma
Cyanosis
Bradycardia

Barbiturate Overdose:

CNS and Respiratory depression
Confusion
Stupor
Coma
Ataxia
Vertigo
Headache
Hypotension
Cardiovascular collapse
Hypothermia / Hyperthermia

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Establish IV access
Blood glucose check
Consider Naloxone
Document medication patient took
Intubate if required, see **RSI** protocol

Pharmacology

Naloxone 0.4-2mg IV, IM or intra-nasal atomizer to reverse respiratory depression suspected due to opioid overdose, repeat as needed to restore respiratory drive. **If no respiratory depression with hypoxia- WITHHOLD Naloxone**. If no positive change in respiratory drive after 2mg, suspect polypharmacy or other underlying causes, do not delay aggressive airway management and RSI as indicated for airway control, patient, and provider safety.
Pediatric: 0.01mg/kg, refer to Broselow tape as necessary

Activated Charcoal 50g oral, if airway is protected and patient is conscious and cooperative with providers to drink contents of tube, consult Medical Control for appropriateness of administration.

Overdose: Tricyclic Antidepressant (TCA)

Indication

General management of suspected or confirmed overdose of tricyclic antidepressant medication (TCA).

Common TCA Medications

Amitriptyline (AmitrilElavil, Endep, Emitrip, Enovil, Etrafon, Limbitrol, Triavil), Amoxapine (Asendin), Desipramine (Norpramin), Doxepin (Sinequan), Imipramine (Tofranil), Maprotiline (Ludiomil), Nortriptyline (Aventyl, Pamelor) Protriptyline (Vivactil), Trimipramine (Surmontil)

Management

Assessment

Signs and symptoms of TCA overdose are related to the cardio toxic effects of sodium and potassium channel blockade in the central nervous system and the myocardium. **Two of the most common complications are seizures and ventricular arrhythmias.** Additional symptoms include tachycardia, drowsiness, dry mouth, nausea and vomiting, urinary retention, agitation, hypotension, hypoventilation, decreased LOC, hallucinations, and cardiovascular collapse.

ECG Changes:

Ventricular conduction delay - QRS >100ms and prolonged QT interval >440ms
QRS>100ms is predictive of seizures
QRS>160ms is predictive of impending ventricular arrhythmias (VF/VT)

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Monitor cardiac rhythm, obtain 12 lead ECG and trend for changes
Treatment for severe cases is focused on airway management and reversing sodium channel blockade, worsening metabolic acidosis and hypotension.
See **Seizure** protocol as indicated
ACLS antiarrhythmic drugs and beta blockers are contraindicated in ventricular arrhythmia due to TCA overdose as this will worsen patient condition.

Pharmacology

Fluid challenge 20-30ml/kg, repeat as needed, consider vasopressor as indicated for continued hypotension.

Sodium Bicarbonate 1mEq/kg for confirmed TCA overdose with widening QRS >120ms, hypotension, altered LOC, ventricular arrhythmias and other signs and symptoms of cardiovascular collapse, consult Medical Control for further treatment if ineffective.

Activated Charcoal 50g oral, if airway is protected and patient is conscious and cooperative with providers to drink contents of tube, consult Medical Control for appropriateness of administration.

Overdose: Beta Blocker / Calcium Channel Blocker

Indication

General management of suspected or confirmed overdose of beta blockers or calcium channel blockers.

Common Beta Blocker Medications

Acebutolol (Sectral), Atenolol (Tenormin), Betaxolol (Kerlone), Bisoprolol (Zebeta,Ziac), Carteolol (Cartrol), Carvedilol (Coreg), Labetalol (Normodyne,Trandate), Metoprolol(Lopressor,Toprol-XL), Nadolol (Corgard), Nebivolol (Bystolic), Penbutolol (Levatol), Pindolol (Visken), Propanolol(Inderal), Sotalol(Betapace), Timolol (Blocadren)

Common Calcium Channel Blocker Medications

Amlodipine (Norvasc), Diltiazem (Cardizem, Tiazac),Felodipine, Isradipine, Nicardipine, Nifedipine (Adalat CC, Procardia), Nisoldipine (Sular), Verapamil (Calan, Verelan)

Management

Assessment

Beta blocker overdose: Signs and symptoms of overdose are related to the cardio toxic effects of beta receptor blockade. Common symptoms include hypotension, bradycardia and altered LOC.

Calcium channel blocker (CCB) overdose: Signs and symptoms are similar to beta blocker toxicity, such as hypotension and conduction disturbances, bradycardia and varying degrees of atrioventricular block.

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Monitor cardiac rhythm, obtain 12 lead ECG and trend for changes
Consult Medical Control for the following advanced therapies for refractory symptoms:

Pharmacology

Fluid challenge 20-30ml/kg, repeat as indicated for hypotension.

Atropine **1mg**, repeat up to 3mg (ACLS), consider vasopressor or additional antidotes below
Pediatric: 0.05 mg/kg IV, repeat as needed

Calcium **10% Injection 1-2g** slow IV push, (ideally infused over 3-5 minutes) for CCB overdose; calcium chloride or gluconate may be used depending on availability and/or agency preference.

Glucagon **1-5mg IV,** for beta blocker and/or calcium channel blocker toxicity refractory to Atropine and/or vasopressor infusion.

Activated Charcoal **50g oral,** if airway is protected and patient is conscious and cooperative with providers to drink contents of tube, consult Medical Control for appropriateness of administration.

Overdose: Organophosphate Exposure

Indications

Severe signs and symptoms secondary to exposure to organophosphates such as insecticides, nerve agents or medications.

Management

Assessment

Signs and symptoms of organophosphate are related to increased parasympathetic tone causing excessive diuresis; remember the acronym (**SLUDGE):**

Salivation

Lacrimation

Urination

Defecation

Gastrointestinal

Emesis

Intervention Sequence

SCENE SAFETY - PROTECT YOURSELF AND YOUR CREW
Support ABC's
Oxygen for SPO2 <94%
Establish IV access; consider second line

Transport Considerations

Position of comfort
Assure appropriate DECON is set up and ready to be performed
See **HAZ-MAT** protocol as indicated
Notify receiving hospital of possible need for additional DECON

Pharmacology

Atropine for Parasympatholytic (anti-cholinergic) properties; large doses repeated throughout the duration of care may be required for severe cases

Atropine **1-5mg** repeat as needed until SLUDGE is relieved, no maximum dose.
Pediatric: 0.05 mg/kg IV, repeat as needed

Documentation

Chemical involved in exposure
Mechanism of exposure
Response to treatment
Communication with Medical Control or poison control

Trauma: General Approach

Indication

Patients involved in any traumatic incident with sustained injuries. Refer to current PHTLS protocols or other MPD trauma approved training as indicated.

Management

Assessment

MOI - Mechanism of Injury
Isolated or multisystem involvement
Obvious signs and symptoms of pain and disability
Suspected internal injuries based on presentation, mechanism, although underlying injuries may be present with no clinical signs and symptoms.
Trauma is rarely isolated to one system or body region, suspect and search for multiple injuries.

Placement of an advanced airway and controlled ventilation should be considered if any of the follow parameters are met (yet not limited to):

Decreased LOC / GCS <8 (CNS injury / shock)
Airway swelling, inability to manage secretions patient is aspirating
Uncontrolled airway with trismus (lock jaw)
Respiratory rate < 10 > 29
Obvious signs of fatigue or impending respiratory failure
Seizures secondary to trauma
SPO2 <90% despite therapy
Anticipated clinical course

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
TREAT LIFE THREATS IMMEDIATELY (uncontrolled bleeding, tension pneumothorax, etc.)
Apply direct pressure, wound packing, hemostatic dressings, and tourniquets as indicated.
Conduct rapid trauma exam and expedite transport for unstable patients
Establish large bore IV access; consider anticipated clinical course and need for secondary IV access, spike saline bags with blood tubing for transition to blood transfusion in hospital.
Treat severe pain and discomfort aggressively, see **General Pain Management** and **Pain Management in Severe Trauma** protocols as indicated.
Keep patient warm and offer reassurance
See **Shock** protocol as indicated
Intubate if required, see **RSI** protocol
If blunt force or penetrating trauma injury to the upper torso with rapid decline in vital signs or resulting cardiac arrest perform bilateral needle decompressions. Follow the **Tension Pneumothorax and Pleural Decompression** protocol.

Transport Considerations

State of Washington Trauma Criteria defines pediatric patient as age 14 or younger
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1.**

Trauma: Spinal Cord Injury

Indication

Signs and symptoms of spinal cord injury.

Management

Assessment

MOI - Mechanism of Injury
Decreased LOC/GCS
Suspected spinal cord involvement due to mechanism: significant injury above clavicles
Obvious signs and symptoms of neurologic disability such as paralysis, weakness, numbness, tingling in extremities (paresthesia), point tenderness over spine.
Trauma is rarely isolated to one system or body region, suspect and search for multiple injuries.

Intervention Sequence

Support ABC's
Oxygen for SPO2 <94%
Trauma exam with emphasis on neurological status
Consider need for spinal precautions, see **Spinal Precaution** protocol
Establish large bore IV access; consider anticipated clinical course and need for secondary IV access for treatment of neurogenic shock
Keep patient warm and offer emotional support for patients experiencing paralysis
Repeat neurological exams to monitor for changes
OBSERVE CLOSELY FOR HYPOTENSION; refer to **Shock** protocol as indicated (Neurogenic)
Intubate if required, **RSI** protocol

Transport Considerations

Consider need for transport to trauma center.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1.**

Trauma: Spinal Precautions

Indication

Care for patients with suspected spinal column injury.

"Spinal immobilization" once described the practice of securing a patient supine on a rigid back board with the use of adjuncts such as head blocks, various straps, tape, buckles, etc. in an effort to "splint" the spinal column and protect from further injury due to manipulation of the spine. Substantial evidence exists that indicates these practices result in more harm than good. Frequently documented outcomes include patient agitation, claustrophobia, increased pain, unnecessary radiography, pressure sores and tissue ischemia, aspiration, and respiratory compromise.

This practice is <u>NOT APPROVED</u> for any routine application in Walla Walla and Columbia Counties.

Backboard Indications: Rigid backboards (including scoop stretcher) are only to be used as extrication and transfer tools to move patients, such as from a vehicle or area of entrapment to the stretcher. Additionally, they may be useful in mass casualty incidents and physically carrying multiple patients.

One Exception: Critical trauma patients may be left on a backboard during transport if CPR is anticipated after beginning transport (provides additional hard surface to maximize CPR quality).

Management

<u>New Focus of Traumatic Spinal Care: "Limited Spinal Motion"</u>

Consider patients at risk for spinal injury based on the criteria below:

Altered level of consciousness, drug or alcohol intoxication, inability to communicate, spinal column pain and/or tenderness, neurologic complaints (numbness, tingling, or motor weakness), anatomic deformity of the spine, distracting injury (injuries so severely painful that neck examination is unreliable), multisystem traumas, long bone fractures, and crush injuries, provider's clinical judgement suggests spinal precautions are indicated.

Intervention Sequence

If any one of the above conditions exists, perform "Limited Spinal Motion":

1. Measure and apply appropriately sized cervical collar
2. If patient is placed on a backboard during extrication from a vehicle, place backboard on the edge of the stretcher and coordinate a slow and controlled transfer to the soft stretcher and minimize unnecessary manipulation of the spine
3. Allow patient to assume position of comfort on soft stretcher mattress
4. Encourage limited movement to the patient and assist with padding of void spaces such as below knees or against hips with towels and blankets as needed
5. Promote patient comfort with positioning, utilize pain control medications as indicated

Limited spinal motion may be omitted if

1. Normal neurological exam in cooperative patient
2. Fully alert and oriented
3. Absence of communication barrier, intoxication, or emotional condition
4. Absence of neck/back pain or tenderness with exam
5. Absence of distracting injuries

Trauma: Athletic / Sports Injury

Indication

Care for patients with possible spinal injuries during athletic / sports events.

Management

Assessment

Nature of injury
Consider chief complaint such as neck or back pain, see **Spinal Precaution** protocol
Assess neurologic status (PMS distal to injury)
Localized injury to extremities
Pain or tenderness to palpation
Memory loss or signs of concussion

Intervention Sequence

Lying Supine

If necessary, remove face mask from helmet for airway control leaving helmet in place. If helmet is removed, shoulder pads should be removed as well to prevent hyper extension/flexion of the head/neck. If one is removed and not the other padding must be utilized to avoid hyper extension/flexion.
Keep patient still
Assess and support ABC's
If necessary, prepare jersey and shoulder pads for removal
Cut jersey from centerline to arms
Cut center laces of shoulder pads
Perform trauma exam
Move each extremity through voluntary range of motion
Splint fractures as indicated, see **Trauma: Orthopedic** protocol
Determine if patient requires cervical spine immobilization
Move patient to long backboard for transfer to stretcher

Transport Considerations

Consider need for transport to trauma center.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1**.

Special Considerations

If an athlete can ambulate to the sideline under their own power, a more extensive examination by a medical professional should be performed either on the sideline or in the locker room before the athlete resumes participation. Coordinate patient care with sports trainers, school athletic directors, and anyone else responsible for implementing athletic protocols specific to concussion other sports related injuries.

Trauma: Facial

Indication

Patients involved in any traumatic incident with sustained injuries to the face.

Management

Assessment

MOI - Mechanism of Injury
Assess for obstruction of airway and breathing
Evaluate for changes before and after treatment
Obvious signs and symptoms of pain and disability
Airway and respiratory effort before and after treatment
Fontanels in infants

Intervention Sequence

Active Bleeding:

Apply direct pressure
Use pressure points if needed
Dress wounds

Broken or Missing Teeth:

Remove any dislodged teeth from mouth
If you find any intact missing teeth:

1. Pick them up by the crown (protect the root)
2. Place it in normal saline or milk for transport to hospital
3. If transport time > 20 minutes from receiving hospital, contact Medical Control

Impaled Cheek:

Remove impaled object if it is obstructing adequate breathing

Fractured Mandible:

Apply Kerlex bandage to secure mandible
Do not compromise airway

Fractured Maxilla:

Maintain airway
Apply cold pack

Transport Considerations

Consider need for transport to trauma center.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1**.
Cervical spine immobilization as needed

Pharmacology

General Pain Management protocols as indicated.

Trauma: Head Injury

Indication

Trauma to the head with associated signs and symptoms.

Management

Assessment

MOI - Mechanism of Injury
Decreased LOC / GCS
Agitation or combative behavior
Loss of short-term memory
Obvious signs of trauma, bleeding, deformity
Note any fluid from ears or nose
Observe for Cushing's Triad indicating increased ICP/intracranial hemorrhage:

1. Bradycardia
2. Hypertension
3. Irregular respiratory pattern

Intervention Sequence

Active scalp bleed - apply direct pressure
Support ABC's
Oxygen for SPO2 <94%
SBP <90, see **Shock** protocol
SBP > than 90 mmHg, supportive care
Keep patient warm
Consider cervical spine immobilization
Clear fluid from nose or ears may be checked with glucometer
Preventing secondary brain injury from hypoxia and hypotension is the primary focus of treatment with head injuries in the prehospital setting
Intubate if required, see **RSI** protocol
Nasal intubation is contraindicated

Transport Considerations

Transport without delay
Consider need for transport to trauma center.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1.**

Pharmacology

General Pain Management protocols as indicated.

Trauma: Eye Injury

Indication

Patients involved in any traumatic incident with sustained injuries to eye.

Management

Assessment

MOI - Mechanism of Injury
Assess for obstruction of airway and breathing
If management of and eye injury is complicated by the presence of contact lenses (i.e., chemical burns) contact lenses may need to be removed

Intervention Considerations

Impaled Object:

Do not remove an impaled object from the eye
Dress the affected eye(s) and secure the object in place as best as possible
Patch the unaffected eye
Offer reassurance and orientation as needed
Encourage patient to limit eye movements

Corneal Abrasion:

Gently irrigate with normal saline
Patch both eyes

Non-Penetrating Foreign Body:

Inspect inner surface of upper and lower lids and conjunctive
Irrigate gently with copious amounts of normal saline

Chemical Burn:

Flush affected eye(s) with normal saline or water until patient is asymptomatic, being careful not to expose unaffected eye.

Blunt Force Trauma:

Elevate head of stretcher to 40 degrees
Look for blow out fracture of orbit and hyphemia

Transport Considerations

Consider need for transport to trauma center.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1**.

Pharmacology

General Pain Management protocols as indicated.

Trauma: Chest

Indication

Patients involved in any traumatic incident with sustained injuries to the chest.

Management

Assessment

MOI - Mechanism of Injury
Consider cervical spine precautions

Sucking Chest Wound:

Apply occlusive chest seal
Monitor closely for tension pneumothorax

Penetrating Injury:

Check for entrance and exit wounds
Injury instrument
Size, shape, caliber
Distance from muzzle

Motor Vehicle Accident:

Details of vehicle and scene
Condition of steering wheel and windshield
Roll over or ejection
Fatality in same vehicle
Airbag or seatbelt use

Flail Chest Injury:

Splint / stabilize injury as best as possible
Assist ventilations with positive pressure as needed
Consider pain control to help with breathing quality

Intervention Sequence

ASSESS BREATHING AND LUNG SOUNDS WITHOUT DELAY
See **Pleural Decompression** protocol if indicated
SBP <90, see **Shock** protocol
Establish IV access, consider second line
Transport without delay

Transport Considerations

Consider need for transport to trauma center.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1**.

Pharmacology

General Pain Management protocols as indicated.

Trauma: Abdominal

Indication

Patients involved in any traumatic incident with sustained injuries to the abdomen.

Management

Assessment

MOI - Mechanism of Injury
Consider internal bleeding
Blunt force or penetrating
Consider associated quadrants of injury and underlying anatomy
Auscultate 4 quadrants
Inspect and palpate quadrants for distention and tenderness
Observe for guarding, pain
Ecchymosis and seatbelt contusions

Penetrating Injury:

Check for entrance and exit wounds
Injury instrument
Size, shape, caliber
Distance from muzzle

Motor Vehicle Accident:

Details of vehicle and scene
Condition of steering wheel and windshield
Roll over or ejection
Fatality in same vehicle
Airbag or seatbelt use

Evisceration:

Cover the exposed tissue with sterile dressing soaked in saline
Do not reduce or attempt to reinsert abdominal contents

Intervention Sequence

SBP <90, see **Shock** protocol
Establish IV access, consider second line
Consider pain control
Transport without delay

Transport Considerations

Consider need for transport to trauma center.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1.**

Pharmacology

General Pain Management protocols as indicated.

Trauma: Orthopedic

Indication

Patients involved in any traumatic incident with sustained fractures, sprains, strains, and dislocations.

Management

Assessment

MOI - Mechanism of Injury
Obvious signs and symptoms of pain and disability
Deformity, angulated extremities
Evaluate for crepitus and muscle spasms
Assess for distal pulses and sensation

Intervention Sequence

Cervical spine immobilization as indicated
SBP <90, see **Shock** protocol
Establish IV access, consider second line

S	Stabilize/splint injury; immobilize the joint above and below the injury
P	Pharmacology; analgesia and anxiolytics as indicated
L	Lift/elevate extremity as indicated to reduce swelling/pain/bleeding
I	Ice/cold compress
N	Neurovascular assessment; circulation, motor, sensory checks
T	Talk, communications with the patient, distraction from injury

Transport Considerations

Consider need for transport to trauma center.
Consider air medical transport for remote incidents and/or expedited transport.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1.**

Loss of Circulation: Alignment Procedure

Fractures may result in loss of distal circulation; this is a critical finding and depending on transport time, it may be necessary to attempt field reduction. Contact Medical Control if needed for assistance.

Procedure: Apply gentle axial traction to the extremity, move in smooth continuous motion to anatomical position to restore circulation distally and to immobilize adequately, use pain and sedation control as indicated.

Pharmacology

General Pain Management and **Pain Management in Severe Trauma** protocols as indicated.

Trauma: Pelvis

Indication

Patients involved in any traumatic incident with suspected pelvic fracture.

Management

Assessment

MOI - Mechanism of Injury
Blunt force trauma at the waist or lower back
Obvious signs and symptoms of pain and disability
Signs and symptoms of hypovolemic shock
Painful palpation
Difficulty or inability to move legs
Feeling of lost rigidity and instability with palpation of hip joints

Intervention Sequence

SBP <90, see **Shock** protocol
Establish IV access, consider second line

Pelvic Stabilization, consider one of the following applications:

1. **Commercial Pelvic Binder (preferred stabilization method)** individual agencies are approved to carry and deploy any of the following devices:
   - **A. T-Pod System (Trauma Pelvic Orthotic Device)**
   - **B. SAM Pelvic Sling**
   - **C. Any other MPD approved device**
2. **Pelvic Sheet Wrap (if commercial device not available)**
   Wrap sheet around pelvis and secure ends to maintain compression and stabilization during transport.

Transport Considerations

Transport without delay, consider need for transport to trauma center.
Consider air medical transport for remote incidents and/or expedited transport.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1**.

Pharmacology

General Pain Management and **Pain Management in Severe Trauma** protocols as indicated.

Documentation Considerations

Time pelvic binder applied and any changes in vital signs (especially blood pressure) before and after application.

Trauma: Amputation

Indication

Any loss of limb including fingers, hands, feet, legs, or arms.

Management

Assessment

Uncontrolled bleeding
Pressure bandage or tourniquet
Blood exposure; protect yourself and your crew

Intervention Sequence

TREAT LIFE THREATENING HEMHORRAGE IMMEDIATELY (TOURNIQUET)
Apply bulky trauma dressings and tourniquet as necessary
SBP <90, see **Shock** protocol
Establish IV access, consider second line
Stump: cover with moist sterile dressing then cover with dry dressing and pressure wrap
Severed Portion: wrap in sterile dressing moistened with NS or sterile water and seal in plastic bag on ice. Assure there is no direct contact with ice.

Transport Considerations

These are time sensitive injuries, limit scene time as much as possible, expedite transport.
Consider need for transport to trauma center.
Consider air medical transport for remote incidents and/or expedited transport.
Refer to **Washington State Trauma Triage Destination Procedure**, **South Central Region Patient Care Procedure #5.1**, **Columbia County Operating Procedure #5.1**, or **Walla Walla County Operating Procedure #5.1**.
Active trauma system for any amputation above wrist or ankle
Keep patient warm

Pharmacology

General Pain Management and **Pain Management in Severe Trauma** protocols as indicated.

Documentation Considerations

Note time of amputation and mechanism involved
Bleeding disorders or anticoagulant therapy
Location of amputation
Estimate total blood loss

Trauma: Burns

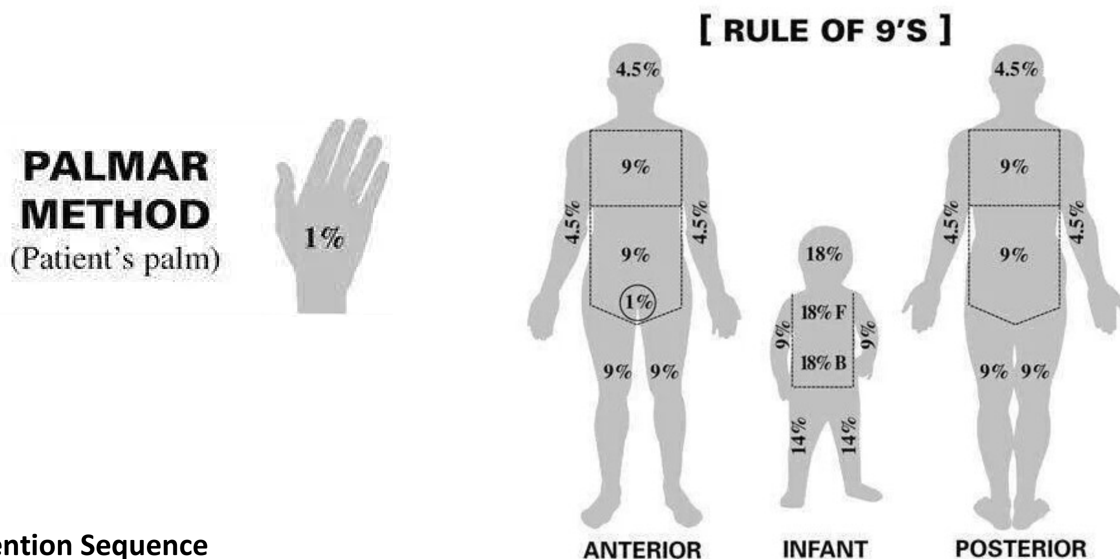
Indication

General management for burn patients.

Management

Assessment

Thermal: Remove from environment, evaluate for singed nares and soot around mouth
Chemical: Brush off and or/or dilute chemical without exposing rescuer, flush eyes with eye wash station or sterile water/normal saline for as long as the patient will tolerate, may use Morgan Lens if available.
Electrical: Make sure victim is de-energized, monitor for arrhythmias, anticipate seizure activity, and suspect internal injuries.
EVALUATE degree of burn and percentage of body surface area (TBSA) involved:



Intervention Sequence

STOP THE BURNING PROCESS
Support ABC's; consider early intubation for airway burns
Dress burns with dry sterile dressings and prevent unnecessary cooling, keep patient warm
Establish IV access, consider second line, and use Lactated Ringer's IV solution if available

Critical Burns: Any degree burn with 20% TBSA or greater or 3rd degree burns greater than 10% body surface area, or include hands, feet, genitalia, or circumferential burns are considered CRITICAL, activate the trauma system with the hospital destination. If hands or feet involved, separate digits with sterile gauze.

High risk for hypothermia: apply sterile burn sheets placed below and on top of patient, followed by warm blankets, minimize contact of broken skin with sources of infection.
Respiratory injury (burns to the mouth or throat).

Transport Considerations

Position of comfort
Keep patient warm (severe burns high risk for hypothermia)

Trauma: Burns (Continued)

Indication

General management for burn patients.

Pharmacology

General Pain Management and **Pain Management in Severe Trauma** protocols as indicated.

IV fluid administration for critical patients:

Administer **1 hour Parkland Formula** 0.25mL x Body Weight (kg) x TBSA (%) = total fluids to be infused in the first hour.

Use the chart below for quick reference of 1 hour infusion totals:

TBSA (Total body surface area) of patient	1 HOUR FLUID GOALS (ml) (Lactated Ringer's preferred if available)							
Weight (kg) ➡	**50kg**	**60kg**	**70kg**	**80kg**	**90kg**	**100kg**	**110kg**	**120kg**
20%	250ml	300ml	350ml	400ml	450ml	500ml	550ml	600ml
30%	375ml	450ml	525ml	600ml	675ml	750ml	825ml	900ml
40%	500ml	600ml	700ml	800ml	900ml	1000ml	1100ml	1200ml
50%	625ml	75ml	875ml	1000ml	1125ml	1250ml	1375ml	1500ml
60%	750ml	900ml	1050ml	1200ml	1350ml	1500ml	1650ml	1800ml
70%	875ml	1050ml	1225ml	1400ml	1575ml	1750ml	1925ml	2100ml
80%	1000ml	1200ml	1400ml	1600ml	1800ml	2000ml	2200ml	2400ml
90%	1125ml	1350ml	1575ml	1800ml	2025ml	2250ml	2475ml	2700ml

Trauma: Hemorrhagic Shock

Indication

Hemorrhagic shock secondary to multisystem trauma with anticipated need for massive blood transfusion in the hospital due to significant internal or external blood loss.

Management

Assessment

Criteria for Tranexamic Acid (TXA) administration:

Patient aged 16 years or older
Traumatic injury <3 hours old

Vital signs indicate hemorrhagic shock:

1. SBP 90mmHg or less
2. Sustained HR >110
3. All other hemorrhage control and treatment measures have been initiated (i.e., direct pressure, hemostatic dressings, tourniquet, IV fluids etc.)
4. Medical Control may authorize adjustments of these parameters for geriatric patients and other select cases as appropriate.

Pharmacology

Tranexamic Acid (TXA) **1g** IV, IO mixed in 100 or 250ml bag of NS or D5W administered over 10 minutes, preferably via IV pump if available.

Special Considerations

Pre-hospital radio/phone report must include TXA has been initiated. Document all cases receiving TXA thoroughly to include exam findings which support provider's decision to administer, preparation of medication, exact time TXA was initiated and any complications or specific orders from Medical Control.

Permissive Hypotension: Providers should only administer enough IV fluid (Lactated Ringers preferred in trauma) to achieve a **SBP 90mmHg**. The goal of IV fluid resuscitation in hemorrhagic shock is to maintain perfusion to vital organs and avoid dilution of clotting factors and natural coagulation.

Near Drowning

Indication

General management for victims of near drowning.

Management

Assessment

Duration of submersion
Temperature of water
Complaints of breathing difficulty
Traumatic injuries sustained
Any reported LOC
Height of fall or dive

Intervention Sequence

Remove victim from water without endangering self or others. This may need to be performed by trained rescuer with appropriate equipment, coordinate with Sherriff's Office, Dive Rescue, Coast Guard, or any other agency involved in the rescue as necessary.
Cervical spine immobilization as indicated
Support ABC's
Oxygen for SPO2 <94%
SBP <90, see **Shock** protocol
Establish IV access
Monitor cardiac rhythm follow ACLS as indicated
Remove wet clothing
Prevent further heat loss, use heat packs as needed
Keep warm and follow **Hypothermia** protocol as indicated
Consider NG tube
Support respiratory effort
Observe for pulmonary edema

Transport Considerations

Position of comfort
All near drowning victims should be examined by a physician

Sexual Assault

Indication

Any incident in which sexual assault is confirmed or suspected by patient or reporting party.

Management

Assessment

Scene and evidence protection
Nature of assault and associated complaints or injuries

Intervention Sequence

Offer reassurance and emotional support
Involve law enforcement on all incidents in which assault is suspected, if law enforcement is not automatically dispatched, ensure they are notified as final jurisdiction will rest on law enforcement where the assault took place.
Do not allow the patient to bathe, change clothes, or use the restroom.
Do not cut or remove patient clothes
If the patient is adamant about urinating, supply the patient with a specimen collection basin (disposable urinal), and encourage the patient not to wipe.
Transport to nearest appropriate facility.

Transport Considerations

Position of comfort
Protect patient modesty

Documentation Considerations

Detailed description of patient complaints, history, and scene
All actions taken including preservation of evidence and coordination with law enforcement
Destination and thorough report to receiving facility

Treatment of Prisoners

Indication

Any call to an individual in the custody of law enforcement or DOC.

Management

Intervention Sequence

RESPONDER SAFETY IS THE NUMBER ONE PRIORITY
Treat according to appropriate protocol
Assure informed consent
Remember confidentiality and privacy of medical information
Keep officers informed when appropriate
Do not leave patient/prisoner without Medical Control approval
If appropriate, law enforcement may transport minor injury or illness patients with approval from Medical Control

HAZ-MAT

Indication

Suspected hazardous materials incident, this protocol applies to all non-hazardous materials response personnel.

Management

Intervention Sequence

Determine material involved from HAZMAT team
Advise Medical Control of material involved and request direction for treatment
HAZMAT or Fire will be responsible for initial decontamination and patient packaging
Don personal protective equipment as directed by HAZMAT team
Receive packaged patient at decontamination corridor from HAZMAT or Fire and transfer to PREPARED ambulance
Treat as directed by Fire, HAZMAT and Medical Control

Ambulance Preparation:

Prepare ambulance as directed by HAZMAT or Fire
Remove all non-essential supplies/equipment
Drape interior and floor of vehicle with plastic as directed
Begin transport
Notify receiving facility: provide relevant information and ask for parking instructions
Do NOT enter ER without specific direction from the ER staff
After transferring the patient to ER staff, return to ambulance and remain inside. Do not move vehicle or allow others inside if there is a possibility of contamination
Contact the Incident Commander to determine how and where the vehicle should be decontaminated

EMS Personal Exposure:

If exposed at scene, disengage from operations, and prevent further exposure and report incident to Safety Officer or HAZMAT and wait for direction.
If exposed enroute to hospital, inform ER and await direction
After decontamination and treatment, receive clearance from HAZMAT group supervisor or ER MD and your supervisor before returning to duty

Special Considerations

Approach cautiously from upwind and uphill
Position your vehicle well away from the incident and headed away from the scene
Assume incident command if trained and within the responsibilities of the jurisdiction
Confirm HAZMAT, utilize ERG from a distance
Isolate the scene as safely as possible, minimize personal exposure
Keep others away from the scene, deny entry

Controlled Medications

Indication

To establish a protocol for the safety and security of controlled medications utilized by the Paramedics of Columbia and Walla Walla Counties. This protocol shall comply with state and federal laws and be supported by agency specific policies and procedures.

Medications

Etomidate (Not controlled substance by DEA schedule)
Ketamine (DEA Schedule III)
Lorazepam (DEA Schedule IV)
Diazepam (DEA Schedule IV)
Midazolam (DEA Schedule IV)
Fentanyl (DEA Schedule II)

Daily Inventory

1. At the start of each shift two personnel shall inventory all controlled medications that are currently in service on medic units.
2. Signatures or initials using agency approved recording systems shall indicate verification of inventory.
3. Missing drugs shall be reported immediately according to agency policies and procedures, and by DEA regulations and rules.

Use on Patient

1. Each drug unit (vial, ampule, or preload) used shall be recorded using agency approved systems.
2. All appropriate information shall be recorded.
3. Drugs shall only be replaced once the appropriate agency specific policies and procedures have been followed allowing for replacement of the appropriate drug.
4. All wasting of drugs shall be witnessed by agency approved personnel.
5. Controlled drugs shall be used only as directed by protocol or by online medical control.
6. Document use of all controlled medications via agency approved recording system.

Broken Vial

1. Each drug unit (vial, ampule, or preload) broken shall be recorded using agency approved systems.
2. All appropriate information shall be recorded.
3. Drug shall only be replaced once the appropriate agency specific policies and procedures have been followed allowing for exchange for the appropriate drug.
4. A witness to the broken vial should complete information in the appropriate agency specific system.

External Jugular Cannulation for IV access

Indication

IV access is needed and peripheral access is not available or has failed.

Management

Intervention Sequence

1. Place patient in Trendelenburg position. It will help distend external jugular vein and decrease the chances of introducing air into the vein
2. Cleanse site with antiseptic
3. Align the IV needle in the direction of the vein with the tip of the needle aimed toward the ipsilateral “on the same side” nipple
4. If you are cannulating the right external jugular vein the needle should be aimed toward the right nipple.
5. Apply light pressure on the inferior aspect of the external jugular to create a tourniquet effect. This is best done by an able assistant.
6. Insert the IV needle and enter the vein
7. Note blood return and advance the catheter
8. Withdraw the needle and attach IV tubing
9. Be certain air is not allowed to enter the vein
10. Cover site with sterile dressing

NG/OG Tube Placement

Indication

To decompress stomach and or remove gas and fluid from the stomach.

Contraindications

Suspected head injury or skill fracture.

Management

Indications

1. Should be considered upon successful ET placement.
2. During cardiac arrest should be inserted through the IGEL

Equipment Preparation

1. Obtain nasogastric tube and inspect for defects and obstruction
2. Suction is readily available and functional
3. Obtain water soluble lubricant, emesis basin, tape, tongue blade, cup of water with straw
4. Warm or cool tube to adjust plastic to the appropriate firmness
5. Determine length of tube needed

Patient Preparation

1. Place patient in a sitting or high-fowlers position and explain procedure
2. Place towel across chest and remove dentures
3. Place emesis basin within patient reach
4. On conscious patients, have patient occlude each nostril and blow nose to determine nostril

Intervention Sequence

1. Coil 3" or 4" of tube around fingers
2. Lubricate coiled portion. Do not occlude the openings
3. Tilt patients head back
4. Gently pass tube into posterior nasopharynx, directing downward and towards patient's ear
5. As the tube reaches the pharynx, patient may gag, allow patient to rest
6. Tilt head slightly forward
7. Offer sips of water through straw, if conscious and possible
8. Gently rotate tube 180 degrees to redirect curve
9. Continue to advance tube gently each time patient swallows
10. If obstruction appears to prevent advancement, gently rotate do not force
11. If unsuccessful remove and try another nostril
12. If signs of distress; gasping, coughing or cyanosis immediately remove tube.
13. Continue to advance until tape mark reaches patient's nostril.
14. Check position: ask conscious patient to talk
15. Use tongue blade and light to examine mouth, especially if unconscious
16. Attach syringe to end of tube, inject 10-20 cc of air while auscultating the abdomen, listen for "whooshing" sound. If belching tube is in the esophagus.
17. Aspirate contents
18. After tube is passed and correct placement confirmed, attach to suction or clamp and secure to face with tape

Abandoned Newborn

Indication

For newborn babies abandoned or brought to the fire station.

Additional information and forms can be found on the Washington State Department of Children, Youth & Families **website**.

Contraindications

If the baby is older than 72 hours:

Explain to parent/person the need to contact CPS (Child Protective Services)
Attempt to obtain a complete medical history.
Ask parent to complete **Child's Medical and Family Background Report** and **Family Ancestry Chart**
Provide Safety of Newborn Children – Letter to Birth Parent
Advise the parent/person that the fire department will transport the newborn to appropriate hospital and CPS will be notified.

Management

Intervention Sequence

Attempt to obtain a complete medical history.
Ask parent to complete **Child's Medical and Family Background Report** and **Family Ancestry Chart**
Provide Safety of Newborn Children – Letter to Birth Parent
Explain to the parent/person that the Fire Department will transport the newborn to the appropriate hospital and CPS will be notified.

Special Considerations

If this is a medical emergency, immediately treat the baby and transport it to the appropriate facility and treat it per patient care protocols.

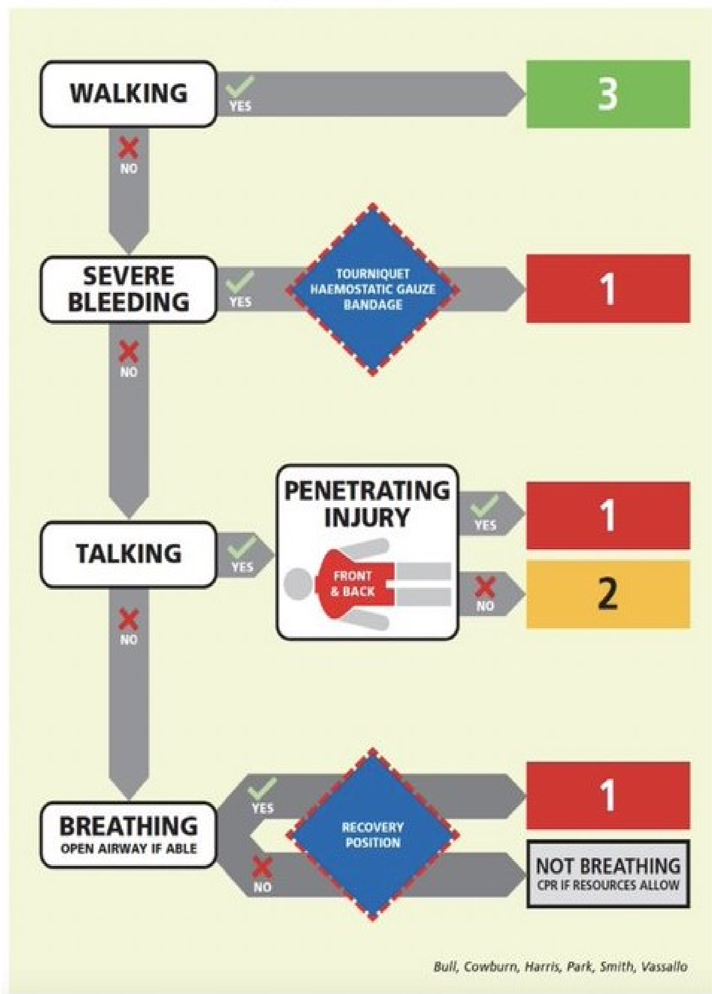
Documentation Considerations

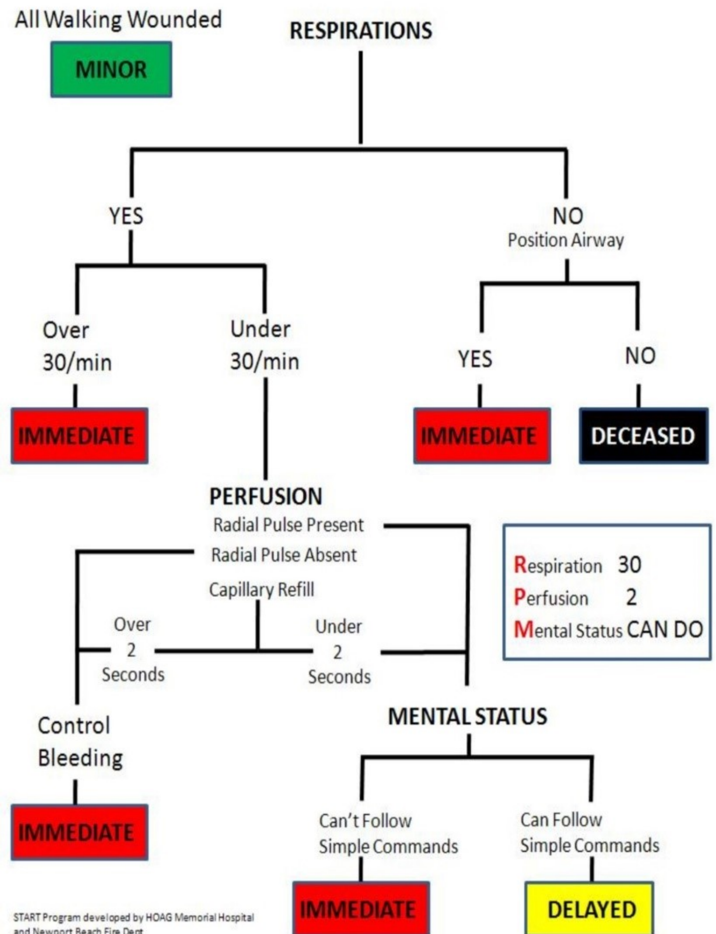
Parent unwilling to provide information
Date and time of birth if available
APGAR
Any pre-natal care
Complications during pregnancy and birth
Parental medical history
Ethnic background

Mass Casualty Incidents (MCI)

Indication

Mass casualty incidents (MCI) or any large-scale incident where the number of patients outnumbers available resources. Initial triage should be rapid, with an emphasis on identifying severe but survivable injuries. A single triage system should be used throughout the incident; below are examples of simple and effective tools for initial triage that may be used.





EZ-IO

Indication

Vascular access is needed and peripheral access has failed. IO access is indicated if the patient exhibits 1 or more of the following:

1. Altered mental status (GCS of 8 or less)
2. Respiratory compromise
3. Hemodynamic instability

Contraindications

1. Fracture of the tibia or femur
2. Previous orthopedic procedures (IO within 24 hours, knee replacement)
3. Pre-existing medical condition (tumor near site or peripheral vascular disease).
4. Infection at insertion site
5. Inability to locate landmarks and find tibial plateau with needle

IO Size Chart

IO Needle Color	Patient Size	Patient Weight (Kg)
Pink	**Children**	**3-39**
Blue	**Adult**	**40+**
Yellow	**Bariatric**	**Excessive tissue**

Management

Intervention Sequence

1. Choose appropriate size needle for patient, prepare EZ-IO driver, needle and extension set
2. Locate insertion site 2cm below anterior tibial tuberosity and cleanse using aseptic techniques Stabilize the leg, position the driver at the insertion site with the needle at a 90-degree angle to the surface of the bone
3. Power the needle set through the skin until you feel the needle tip encounter the bone then continue to apply firm steady pressure through the cortex. Stop when the needle flange touches the skin or a sudden decrease in resistance is felt.
4. Remove the driver from the needle set ad confirm placement
5. Connect primed EZ-connect
6. If the patient is awake, consider small doses of **Lidocaine** **10-20mg** administered slowly until adequate anesthetic relief is achieved, up to a **maximum of 40mg.**
7. Flush or bolus the EZ-IO catheter rapidly with 10 ml of NS
8. Administer the infusion or medications
9. Dress the site and secure the tubing, apply EZ-IO wrist indicator
10. If unsuccessful or subcutaneous swelling occurs stop IV, remove needle and cover the wound.
11. Make a second attempt in the other leg.
12. Humeral head as alternative site for access may be used
13. All providers shall receive annual refresher training on these procedures

PICC Line Access

Indication

<u>MPD APPROVED TRAIINING REQUIRED</u> before implementation of this protocol in the field.

Management

A peripherally inserted central catheter (PICC) is a long, slender, small, flexible tube that is inserted into a peripheral vein, typically in the upper arm, and advanced until the catheter tip terminates in the vena cava just above the right atria. Typically these are used for long term IV access when a patient requires interventions lasting longer than is indicated for a peripheral or midline catheter.

Authorized Field Access

PICC lines may be accessed when:

1. There is a need for drug or fluid administration and a patent PICC line is in place.
2. Patient or patient's caregiver requests the use of a currently established PICC line.
3. PICC line is always a preferred route of administration for vasopressors.

Contraindications

1. Inability to infuse through the catheter or partial or complete dislodgement of PICC line
2. Catheter located in any place other than the patient's upper arm.
3. Adenosine – The line may rupture during rapid infusion due to over pressurization.
4. Dextrose 50% - The catheter can be damaged due to the viscosity of the fluid.

Procedure

1. Use clean gloves and maintain sterility as much as possible.
2. Vigorously scrub the port with an alcohol pad for at least 15 seconds.
3. While maintaining sterility of the syringe, attach a 10ml saline flush to the needleless connector.
4. Unclamp the catheter and slowly aspirate for a blood return.
5. Blood should draw freely. If it does not, take steps to locate an external cause of obstruction, reposition patient's arm and attempt to draw again.
6. If you obtain blood return, slowly inject all 10ml of saline then remove and discard syringe.
7. Don't forcibly flush the device; further evaluate the device if you meet resistance. If unable to flush or significant resistance is met, do not use PICC line and obtain other vascular access.
8. If blood does not draw but line flushes easily you may still administer medications and fluids.
9. After removing the syringe, attach the catheter to the end of the IV tubing and begin infusion.
10. Administer medications directly through the port or IV tubing if indicated.

Precautions

1. Do not flush or aspirate with less than a 10ml syringe. Smaller size syringes generate too much pressure and can damage the catheter.
2. After patency of the PICC has been confirmed by using a 10mL prefilled syringe, medications can be administered by IV bolus injection in a syringe of appropriate size to measure and administer the required medication dose. Do not transfer the medication to a larger syringe.
3. Do not attempt the reinjection of aspirated blood as it may contain clots.
4. Ensure all line connections are secure.
5. PICC lines access the patient's central circulation, and the risk of infection is high. Avoid contamination to ports and connections while accessing.

Tourniquets

Indication

To control bleeding when life-threatening limb hemorrhage is not controlled with direct pressure or other simple measures. Traumatic amputation has occurred.

Management

Assessment

Signs and symptoms for use of tourniquet may include:
Spurting/ steady flow or oozing blood.
Bright red or dark red blood with uncontrolled bleeding.
Separated or displacement of a body part or tissue.
Signs of shock

Intervention Sequence

1. Expose the extremity by removing clothing in proximity to the injury.
2. Place the tourniquet directly over the exposed skin at least 2” proximal to the injury. Note: Tourniquets should only be applied over long bones (humerus or femur). Lower leg or wrist application will not compress vasculature effectively.
3. Twist tourniquet windlass rod until bleeding stops.
4. Secure tourniquet in place.
5. Record time and date of application on patient where it can easily be seen.

Special Considerations

The tourniquet is effectively applied when there is cessation of bleeding from the injured extremity, indicating total occlusion of the vasculature. Any preexisting distal pulse should be absent after tourniquet application as well.

Nasal Atomizer

Indication

If no IV access is available, certain medications may be considered for administration intra-nasally through mucosal atomization device (MAD).

Management

Intervention Sequence

1. Aspirate the proper volume of medication into the syringe plus 0.1 ml of medication should be drawn up to account for the dead space within the atomizer.
2. Remove the syringe from the needleless devise.
3. Attach the atomizer tip via the Luer lock mechanism, twist into place.
4. Using your free hand to hold the crown of the head stable, place the tip of the atomizer snugly against the nostril aiming slightly up and outward (toward the top of the ear on the same side).
5. Briskly compress the syringe plunger to deliver half the medication into the nostril.
6. Ideally ½ml per nostril should be given but up to 1 ml per nostril can be given. There will be some run off. If you need more than 2 ml total, consider titration with the second dose given in 5 minutes or switch to IO administration. Additionally, it would be ideal to give half the dose of the medication per nostril.

Approved Pharmacology for IN (intra-nasal atomizer):

Fentanyl
Ideal for pediatrics or adults refusing IV access
Pain control without IV established

Ketamine
Pain Management

Lorazepam
Seizures
Pain control adjunct
Combative patients, behavior/psychiatric emergencies

Midazolam
Seizures
Combative patients, behavior/psychiatric emergencies

Naloxone
Opiate overdose
Altered mental status with respiratory depression

Appendix A – Pharmacology

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Appendix A – Pharmacology

Acetaminophen (Tylenol)

Classification / Actions

Antipyretic (fever reducer)

Indications

Pediatric seizures associated with high fever >103

Contraindication

Hypersensitivity
High doses with hepatic impairment

Side Effects

None

Administration

Precautions

Lubrication may be required (water based solution)

Administration Route

Rectal suppository

Application

Used as one part of the **Seizure / Convulsions** protocol

Dosages

Pediatric

20 mg/kg

Appendix A – Pharmacology

Acetylsalicylic Acid (Aspirin/ASA)

Classification / Actions

Platelet aggregator inhibitor / anti-inflammatory agent
Proven highly effective in reducing mortality following myocardial infarction

Indications

New onset of chest pain suspected of ischemic origin

Contraindication

GI bleeds
Hemorrhagic CVA
Active ulcer disease
Asthma

Side Effects

Heartburn
GI bleeding
Nausea
Vomiting
Wheezing
Prolonged bleeding

Administration

Precautions

Can cause gastrointestinal upset and bleeding

Dosage Form

Baby Aspirin – chewable 81 mg tablets

Administration Routes

PO – Chewed

Application

Used as one part of the **Chest Pain / Suspected Myocardial Ischemia** protocol

Dosages

Adult

324 mg

Appendix A – Pharmacology

Activated Charcoal (ACTi dose)

Classification / Actions

Adsorbent / Suspension
Activated Charcoal binds to the products in the gastrointestinal tract

Indications

Poisoning or overdose
Used when inducing vomiting is contraindicated

Contraindication

Should not be administered before or together with Ipecac

Side Effects

Constipation
Nausea
Vomiting
Abdominal cramping
Abdominal bloating
Diarrhea from Sorbitol

Administration

Precautions

Do not administer to unconscious patients, unless administered via NG/OG tube and ET in place.

Dosage Form

50 grams Activated Charcoal with sorbitol
Need to mix product within the bottle (charcoal will be at the bottom)

Routes of Administration

PO
NG tube
OG tube

Dosages

Adult

50 gram tube (ideally 1g/kg)

Pediatric

25 – 50 grams

Appendix A – Pharmacology

Adenosine (Adenocard)

Classification / Actions

Anti-arrhythmic
Is a naturally occurring nucleoside that slows the AV conduction through the AV node
Has an exceptionally short half-life – approximately 5 seconds
Decreases conduction of electrical impulse through the AV node and interrupts AV re-entry
Often referred to as chemical cardioversion

Indications

SVT

Contraindication

Patients in 2nd or 3rd degree heart blocks
Unstable angina
Drug induced tachycardia

Side Effects

Headache
Facial flushing
Nausea
Shortness of breath
Dizziness
Brief period of asystole

Administration

Precautions

Adenosine can cause arrhythmias at the time of cardioversion. They will usually only last a few seconds (PVC, PAC, asystole, sinus bradycardia, sinus tachycardia)
Use with caution on patients taking: Digoxin, Verapamil, Quinidine, Beta Blockers, and Calcium Channel Blockers.

Dosage Form

6mg in 2 ml vials
6 and 12mg preloads

Routes of Administration

Rapid IV bolus only at the closest port to the patient followed by 20 ml saline flush.

Dosages

Adult

6mg followed by 20 ml saline flush

If no effect

12mg followed by 20 ml saline flush, may repeat 12mg a second time if no effect

Pediatric

0.1mg/kg followed by 20 ml saline flush

Appendix A – Pharmacology

Albuterol Sulfate (Ventolin)

Classification / Actions

Sympathetic agonist
Bronchodilator
Sympathomimetic (Beta 2 selective)

Indications

Bronchial asthma
Reversible bronchospasm associated with chronic bronchitis and emphysema
COPD with exacerbation
Respiratory distress with wheezing
Anaphylaxis (for wheezes)

Contraindication

Known hypersensitivity of albuterol
Tachycardia (relative)

Side Effects

Tachycardia
Anxiety
Dizziness
Headache
Nervousness
Chest pain
Nausea
Tremors
Hypertension

Administration

Dosage Form

Dose vials containing 2.5 mg in 3 ml capsule

Storage

Room temperature
Protect from sunlight

Routes of Administration

Metered-Dose Inhaler
Nebulizer

Dosages

Adult and Pediatric

2.5mg Albuterol via oral nebulizer, repeat as needed

Appendix A – Pharmacology

Amiodarone (Cordarone)

Classification / Actions

Class III anti arrhythmic
Alpha and beta adrenergic blocking properties
Complex anti-arrhythmic (has vasodilatory effects and negative inotropic properties)

Indications

Used in a wide variety of atrial and ventricle tachyarrhythmia's and for rate control of rapid atrial arrhythmias
Cardiac Arrest
V-Fib
Pulseless V-Tach
Wide complex tachycardia of unknown origin
Narrow complex SVT
Atrial tachycardia
Rate control A-Fib/A-Flutter duration less than 48 hours
WPW
Junctional tachycardia

Contraindication

Known hypersensitivity to Amiodarone
Sinus bradycardia
2nd and 3rd degree heart blocks
TCA, beta blocker, calcium channel blocker overdose

Side Effects

Hypotension
Decreased heart rate
AV block
V-Fib
V-Tach
May prolong QT interval

Administration

Dosage Form

Supplied in various ampules or vials (50 mg per ml)
Must be mixed for infusion
Protect from excessive heat and light

Administration Routes

IV / IO

Amiodarone (Cordarone) – Continued

Dosages

Adult

Cardiac Arrest

300 mg IVP, IO bolus
Second dose 150 mg IVP/IO
Maintenance infusion after ROSC 1mg/min

Impaired Heart

Rapid infusion (mix 150 mg/50 ml of D5W), 150 mg over 10 minutes

Tachyarrhythmia

150mg over 10 minutes

Maximum cumulative dose

2.2grams over 24 hours

Pediatric

Cardiac Arrest

5mg/kg (max 300 mg)
May repeat as indicated per current PALS guidelines

Appendix A – Pharmacology

Atropine Sulfate

Classification / Actions

Anti-cholinergic (parasympathetic)
Acts by blocking acetylcholine receptors inhibiting parasympathetic stimulation
Antidote for organophosphate poisoning
Increase discharge of SA node and accelerates conduction through the AV node increasing heart rate
Decreases gastrointestinal secretions (SLUDGE)
Salivation, Lacrimation, Urination, Defecation, GI Upset, Emesis

Indications

Unstable / symptomatic bradycardia
Organophosphate poisoning (SLUDGE)

Contraindication

Avoid in hypothermic bradycardia patients
Patients with prior history of heart transplants (no vagal nerve)

Precaution

May not be effective in infra-nodal (Type II) AV block and 3rd degree block with wide QRS complexes

Side Effects

Tachycardia
Dry mouth
Blurred vision
Dilated pupils
Drowsiness
Confusion
Palpitations
Headache

Administration

Precautions

When given to pediatrics, minimum dose of 0.1 mg to avoid paradoxical bradycardia (also possible if administered too slowly)
May increase myocardial oxygen demand
Occasionally causes V-Tach or V-Fib

Appendix A – Pharmacology

Atropine Sulfate – Continued

Administration

Precautions

May worsen bradycardia associated with high degree AV block (2nd degree Type 2 and 3rd degree), go straight to pacing
Maximum dosage of 3mg

Dosage Form

1mg in 10 ml pre-filled syringe

Administration Routes

IV, IO, ET (double the dose)

Dosages

Adult

Unstable / symptomatic bradycardia

1mg every 3-5 minutes, 3mg max.

Organophosphate poisoning

1-5mg every 15-30 minutes (no maximum dosage) titrate to relieve SLUDGE

Pediatric

Bradycardia

0.02mg/kg every 3-5 minutes (maximum 0.04mg/kg)

Organophosphate poisoning

0.05mg/kg

Minimum Dose

0.1mg

Maximum Single Dose

0.5mg for a child and 1 mg for adolescents

Appendix A – Pharmacology

Calcium 10% Injection (Chloride or Gluconate)

Classification / Actions

Electrolyte
Plays role in cardiac contractility and automaticity

Indications

Potassium toxicity (hyperkalemia)
Antidote for magnesium overdose (hypermagnesemia)
Bradycardia/hypotension associated with calcium channel blocker overdose

Contraindication

Patients taking Digoxin

Side Effects

CNC effects, sensation of tingling
Hypotension
Bradycardia
Syncope
Local tissue reaction, irritation/necrosis

Administration

Precautions

Not compatible with Sodium Bicarbonate, mixing in the same IV line will produce a dangerous precipitate.
If Calcium is being given in conjunction with Sodium Bicarbonate, flush IV line thoroughly between each drug administration.

Dosage Form

1 gram in single dose vial
1 gram in 10 ml preloads

Routes of Administration

IV / IO

Dosages

Adult

1-2 grams 10% injection solution IV/IO, may be repeated after 10 minutes as indicated

Appendix A – Pharmacology

Dextrose

Classification / Actions

Carbohydrate
10% or 50% dextrose in water, it supplies supplemental glucose to the brain in cases of hypoglycemia
Elevates blood glucose levels rapidly

Indications

Hypoglycemia
Blood sugar less than 60

Contraindication

Known hypersensitivity
Intracerebral bleeding
Hemorrhagic CVA/Stroke

Side Effects

Can cause tissue necrosis and phlebitis at the injection site

Administration

Precautions

Watch for signs of infiltration
Check blood sugar prior to and after administration
Have patient eat something after they have resumed their normal LOC if they are not being transported to the hospital (relatively short acting)

Dosage Form

25 grams in 50 ml preloads
2.5 grams in 10 ml preloads (D25 for pediatrics/infants)
D5W 250ml
D10% 250ml (25grams)

Routes of Administration

IV / IO

Dosages

Adult

25 grams D50% or 250ml D10% (equals 25g D50)

Pediatric

0.5-1g/kg IV, IO up to 25g
Neonate: 2ml/kg Dextrose 10%
1 month – 8-years-old: 5-10ml/kg Dextrose 10% or 2-4ml/kg Dextrose 25%
>8-year-old use 50% concentration

Appendix A – Pharmacology

Diazepam (Valium)

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule IV.

Classification / Actions

Benzodiazepine frequently used as an anticonvulsant, sedative, and hypnotic
Suppresses the spread of seizure activity through the motor cortex of the brain
Effective skeletal muscle relaxant
Useful to pre-medicate for cardioversion to induce amnesia

Indications

Major motor seizures
Status epilepticus
Pre-medicate for cardioversion /pacing
Sedation prior to intubation
Fractures with spasms
Severe anxiety

Contraindication

Known hypersensitivity
Pregnancy (Category D)
Nursing mothers

Side Effects

Drowsiness
Dizziness
Hypotension
Amnesia
Nausea / Vomiting
Respiratory depression

Administration

Precautions

Be prepared to ventilate
Has a 20 to 50 hour half life

Dosage Form

10mg in 2ml pre-load syringes

Routes of Administration

IV (not faster than 1 ml per minute, may be dripped in)
IM, rectally

Appendix A – Pharmacology

Diazepam (Valium) – Continued

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule IV.

Dosages

Adult

Seizures

5 – 10mg IV, IM, rectally

Acute alcohol withdrawal

2.5-5mg IV as needed for tremors

Sedation

2.5-5mg IV, IM

Chemical restraint

5-10mg IM

Pediatric

Infant 30 days to 5 years

0.2 – 0.5mg every 2 to 5 minutes up to 5mg **max**

5 years of age and older

1mg every 2 to 5 minutes up to 10mg **max**

Appendix A – Pharmacology

Diltiazem (Cardizem)

Classification / Actions

Calcium channel blocker
Potent vasodilator
Decreases heart rate by depressing AV node conduction

Indications

To control ventricular rate in atrial fibrillation and atrial flutter

Contraindication

CHF
SA node or AV conduction disturbances
Low blood pressure; below 90 systolic
WPW
2nd and 3rd degree heart blocks
IV beta blocker use

Side Effects

Hypotension
Bradycardia
Dizziness
Flushing

Administration

Slow IVP over 2 minutes

Dosages

Adult

0.25mg/kg first dose

0.35mg/kg second dose

Appendix A – Pharmacology

Diphenhydramine Hydrochloride (Benadryl)

Classification / Actions

Antihistamine
Histamine is released into the body after exposure to an antigen in which the body has already been exposed to. Histamine acts on two different receptors – H1 and H2
H1 – when stimulated causes broncho-constriction and constriction of the gut
H2 – when stimulated causes peripheral vasodilation and secretion of gastric acids
A potent antihistamine that blocks H1 and H2 receptors and has strong antiemetic effects

Indications

Anaphylaxis
Extra pyramidal symptoms
Intractable nausea and vomiting

Contraindication

Should not be used in management of lower respiratory diseases such as asthma

Side Effects

Hypotension
Headache
Palpitations
Tachycardia
Drowsiness
Confusion
Disrupted coordination

Administration

Precautions

Sedation effects can be enhanced by alcohol, depressants, narcotics, and other antihistamines

Dosage Form

50mg in 1 ml ampules or vials

Routes of Administration

IV onset of 5 to 15 minutes
IM onset of 30 to 40 minutes

Dosages

Adult

<u>Anaphylaxis / EPS</u>

25-50 mg

<u>Intractable nausea /vomiting</u>

12.5mg-25mg

Pediatric

1-2 mg/kg

Appendix A – Pharmacology

Epinephrine 1:1,000 (Adrenalin)

Classification / Actions

Sympathetic agonist
Naturally occurring catecholamine
Potent alpha and beta adrenergic stimulant that affects beta receptors more profoundly
Effects include increased heart rate, cardiac contractile force, systemic vascular resistance, electrical activity within the myocardium, and an increase in blood pressure and automaticity
Causes bronchodilation due to effects on the beta 2 receptors
Onset of action within 90 seconds and is of short duration

Indications

Anaphylactic shock (to include pregnancy)
Bronchial asthma
Pediatric cardiac arrest (see dosages below)
Bradycardia – PALS
Croup in children

Contraindication

Epiglottitis
Tachycardia
Known coronary artery disease
Hypertension
Pregnancy (except in anaphylaxis)

Side Effects

Tachycardia
Hypertension
V-Fib
V-Tach
Angina
Headache
Anxiety
Tremors
Nausea

Appendix A – Pharmacology

Epinephrine 1:1,000 (Adrenalin) – Continued

Administration

Precautions

Should be protected from light

1:1,000 is primarily administered IM to ensure a steady and prolonged action. Blood pressure, pulse, and ECG should be constantly monitored

Dosage Form

1mg in 1 ml vial

Drip: 1mg in a 250ml bag of fluid (4mcg/ml) run at 2mcg to 10mcg per minute and titrate to effect. In asthma and anaphylaxis stop infusion when you get positive response.

Routes of Administration

ET, IV (**max** 0.3 mg), IO, IM

Dosages

Adult

Allergic reaction

0.3mg IM

2-10mcg/min infusion

Severe bronchial asthma (status asthmaticus)

0.3mg IM as indicated for continued distress

2-10mcg/min infusion

Pediatric

Cardiac Arrest

See **1:10,000** protocol or 0.1mg/kg ET 1:1,000

Bradycardia

0.1mg/kg ET (1:1,000)

Allergic reaction or bronchoconstriction

0.01mg/kg IM max 0.3mg, may repeat every 10 minutes up to 3 doses

0.1-2mcg/min infusion

Croup

Nebulize 3mg 1:1000 (1mg/1ml concentration) in 3 ml NS

Asystole, PEA, V-Fib, Pulseless V-Tach

If initial dose is via ETT, 0.1mg/kg diluted in 3-5 ml

Appendix A – Pharmacology

Epinephrine 1:10,000 (Adrenalin)

Classification / Actions

Sympathetic agonist
Naturally occurring catecholamine
Potent alpha and beta adrenergic stimulant that affects beta receptors more profoundly
Effects include – increased heart rate, cardiac contractile force, systemic vascular resistance, electrical activity within the myocardium, and an increase in blood pressure and automaticity
Causes bronchodilation due to the effects on the beta 2 receptors
Onset of action within 90 seconds and is of short duration
Increases myocardial oxygen demand

Indications

Cardiac arrest (Asystole, PEA, V-Fib, Pulseless V-Tach)
Anaphylactic shock
Severe reactive airway disease
Pediatric cardiac arrest (see dosage below, unless dosing through ETT then use **1:1,000** protocol)
Bradycardia – PALS
Croup in children – 6 months to 3 years of age, gradual onset of signs and symptoms, often preceded by an upper respiratory infection, worse at night, may or may not have a fever, and varies from mild to severe

Contraindication

Should not be administered to patients who do not require extensive CPR efforts
Should only be administered IV, IO, and ET
Epiglottitis– Usually presents in patients greater than 2 years of age, rapid onset, fever, drooling, and retractions

Side Effects

Tachycardia
Hypertension
V-Fib
V-Tach
Angina
Palpitations
Headache
Anxiety
Tremors
Nausea

Appendix A – Pharmacology

Epinephrine 1:10,000 (Adrenalin) – Continued

Administration

Precautions

Should be protected from light
1:10,000 is to be administered IV/IO

Dosage Form

1mg in 10 ml preload syringe
1mg 1:1000 (1ml) diluted in 9ml saline flush

Routes of Administration

IV, IO, and ET

Dosages

Adult

Cardiac Arrest with ETCO2 <20

1mg IV/IO every 5 minutes
1mg ET every 5 minutes

Anaphylactic shock

3ml IV

Pediatric

Cardiac Arrest

Initial dose of 0.01mg/kg IV, IO, repeat dose x3-5 minutes throughout code and as otherwise indicated per current ACLS guidelines

Bradycardia

0.01mg/kg IV/IO (1:10,000)

Anaphylactic shock

0.01mg/kg (1:10,000) IV/IO

Appendix A – Pharmacology

Epinephrine 1:100,000 (Adrenalin)

Classification / Actions

Sympathetic agonist
Naturally occurring catecholamine
Potent alpha and beta adrenergic stimulant that affects beta receptors more profoundly
Effects include – increased heart rate, cardiac contractile force, systemic vascular resistance, electrical activity within the myocardium, and an increase in blood pressure and automaticity
Causes bronchodilation due to the effects on the beta 2 receptors
Onset of action within 90 seconds and is of short duration
Increases myocardial oxygen demand

Indication

Hypotension
ROSC from cardiac arrest with hypotension
Bridge to improve perfusion/blood pressure while vasopressor infusion is being prepared
Rapidly deteriorating trauma patient

Administration

Precautions

Should be protected from light
1:100,000 is to be administered IV/IO

Dosage Form

0.1mg 1:10,000 diluted in 9ml NS preload syringe

Routes of Administration

IV, IO, and ET

Dosage

20mcg every 2 minutes as needed to maintain BP > 90 or until Norepinephrine or Epinephrine drip is infusing with desired effects.

Appendix A – Pharmacology

Etomidate (Amidate)

Not a controlled substance by DEA schedule.

Classification / Actions

Anesthetic, general
Onset of action intravenous injection – 10 to 20 seconds with peak response in 1 minute
Single dose duration of a 0.3mg/kg dose is 4 to 10 minutes

Indications

Patients in need of sedation
Cardioversion if Midazolam cannot be used
RSI for head injuries, burns and penetrating eye injuries when needed

Contraindication

Hypersensitivity to etomidate products
Not recommended in pregnancy or sepsis
Adrenal insufficiency

Side Effects

Brief pain or burning sensation at IV site
Coughing or hiccups
Drowsiness
Temporary uncontrollable muscle movements
Nausea Vomiting

Administration

Precautions

Watch for respiratory depression and have resuscitation equipment readily available.

Dosage Form

20mg in 10ml (2mg/ml)
40mg in 20ml (2mg/ml)

Routes of Administration

IV / IO

Dosages

Adults and Pediatrics >10 years old

Rapid Sequence Induction (RSI)

0.3mg/kg

Cardioversion

0.2mg/kg

Appendix A – Pharmacology

Fentanyl Citrate (Sublimaze)

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule II.

Classification / Actions

Narcotic analgesic with rapid onset and a short duration of action
Central nervous system depressant
Decreases sensitivity to pain
Although chemically unrelated to Morphine, it produces pharmacological effects and a degree of analgesia similar to Morphine
50 – 100 times stronger than Morphine
Effects can be reversed with Naloxone
Onset of action is immediate, and duration of action is up to 30 minutes

Indications

Patients in need of pain control
Maintenance of analgesia and sedation
Used with patients being intubated

Contraindication

Known hypersensitivity

Side Effects

Hypotension
Hypertension
Increased intracranial pressure
Dizziness
Apnea
Bradycardia
Altered level of consciousness
Respiratory depression

Administration

Precautions

The effects of Fentanyl are enhanced with the presence of other narcotics, anti-histamines, sedatives, or alcohol
Watch for signs of respiratory depression and bradycardia
Patients receiving Fentanyl should be continuously monitored with resuscitation equipment readily available
Use with caution for patients with liver and kidney problems
Incompatible with Dilantin, Sodium Bicarb, Brevitol, Nembutal, and Pentothal

Appendix A – Pharmacology

Fentanyl Citrate (Sublimaze) – Continued

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule II.

Administration

Dosage Form

100 mcg in a 2 ml vial, ampule, or preload (50 mcg per ml)

Routes of Administration

IV, IO, IM, IN

Dosages

Adult

Pain control

0.5-1mcg/kg in conscious patient, may repeat dose as needed up to 3mcg/kg. Be aware of sedation effects in elderly patients and any patient with airway compromise.

Intra-nasal

2mcg/kg

Rapid Sequence Induction (RSI)

2-3mcg/kg prior to induction agent

Post Intubation sedation/analgesia

1-2mcg/kg IV push q 10 min., up to -4mcg/kg total
0.5-1mcg/kg.hr infusion, up to 3mcg/kg.hr

Pediatric

Pain control

1mcg/kg

Intra-nasal

2mcg/kg (1ml per nostril at a time)

Infusion

For long transports requiring analgesia or sedation of intubated patients, add 250mcg to a 250ml bag of saline and start drip at 0.5 to 1 mcg/kg per hour and titrate as needed up to 3mcg/kg or 300mcg/hr.

Glucagon (Gluca-Gen)

Classification / Actions

Hormone
Glucagon is a protein secreted by the alpha cells of the pancreas
Causes a breakdown of the stored glycogen to glucose in the body
Is only effective if there is glycogen stored in the body
Onset of action is 5 – 20 minutes and blood sugar is less than 60

Indications

Hypoglycemia
Used when an IV cannot be established
Antidote for beta blocker/calcium channel blocker overdoses

Contraindication

Known hypersensitivity

Side Effects

None

Administration

Precautions

Check blood sugar prior to and after administration
Have patient east something after they have resumed their normal LOC if they are not being transported to the hospital (relatively short acting)

Dosage Form

Medication needs to be mixed (reconstituted):

Draw up and inject sterile saline into the vial with the powder
Shake until mixed completely then draw back up into syringe

Routes of Administration

IM, IV, IO

Dosages

Adult

Hypoglycemia

1mg IM

Overdose (beta blocker, calcium channel blocker)

1-5mg IV

Pediatric

0.1mg/kg up to 1 mg

Appendix A – Pharmacology

Glucose Gel (Oral Solution)

Classification / Actions

Carbohydrate
40% Dextrose
Elevates blood glucose levels
Type of sugar that the body readily absorbs

Indications

Hypoglycemia patients (conscious)
Blood sugar less than 60

Contraindication

Known hypersensitivity
Intracerebral bleeding
Hemorrhagic CVA
Unconsciousness

Side Effects

Increase in salivation
Increase in blood sugar

Administration

Precautions

Must have a gag reflex and be conscious
Check blood sugar prior to and after administration
Have patient east something after they have resumed their normal LOC if they are not being transported to the hospital (relatively short acting)

Dosage Form

Tube that contains 15 grams of glucose

Routes of Administration

Oral only

Dosages

Adult

One complete tube orally, preferably inside the cheeks. May repeat as needed to achieve glucose level sufficient enough to improve level of consciousness so that patient may eat food in order to sustain blood glucose.

Pediatric

Same as adult except not recommended in children under 2 years of age.

Appendix A – Pharmacology

Haloperidol Lactate (Haldol)

Classification / Actions

Major tranquilizer
Anti-emetic properties
Blocks dopamine receptors in the brain responsible for mood and behavior

Indications

Acute psychotic episodes, chemical restraint
Intractable nausea and vomiting unresolved with other anti-emetic therapies; often preferred with palliative care patients undergoing chemotherapy, radiation or cyclic vomiting syndrome

Contraindication

Should not be administered if there is a known intolerance or allergy
Should not be used in the management of dysphoria cause by Talwin

Side Effects

Insomnia
Nausea / Vomiting
Sedation / Seizures
Respiratory depression
Constipation / Hypotension
Tachycardia / Blurred vision

Administration

Precautions

Use caution when patients are using anticoagulants; Parkinson-like reactions (EPS) have been known to occur after administration (have Diphenhydramine ready to administer)

Dosage Form

5 mg in 1 ml vial
Do not refrigerate

Routes of Administration

IM only

Dosages

Adult

<u>Chemical Restraint</u>

2.5-5mg IM, may repeat up to 10mg

<u>Nausea/vomiting</u>

1-2.5mg IM (hyperemesis unresponsive to front line antiemetic agents, often used for patients undergoing chemotherapy.

Pediatric

0.05 – 0.15mg IM, must call Medical Control (rarely used)

Appendix A – Pharmacology

Ipratropium Bromide (Atrovent)

Classification / Actions

Anticholinergic / parasympatholytic (blocks acetylcholine receptors)
Bronchodilator
Chemically related to Atropine.

Indications

Treatment of bronchospasm (bronchodilation effect) associated with asthma/COPD (emphysema/bronchitis) and dries respiratory tract secretions.

Contraindication

Hypersensitivity
Treatment of acute bronchospasm for which rapid intervention is required

Side Effects

Palpitations
Anxiety
Dizziness
Headache
Nervousness
Rash
Nausea/vomiting

Administration

Precautions

Use caution when administering to elderly patients and patients with cardiovascular disease or hypertension. Lung sounds should be auscultated before and after each treatment. Ideally the patient's peak flow rate and tidal volume should be measured before and after each treatment.

Dosage Form

0.5mg (500mcg) in 3 ml NS vial

Routes of Administration

Nebulizer

Dosages

Adult and Pediatric

0.5mg (500mcg) nebulized x1

Appendix A – Pharmacology

Ketamine (Ketalar)

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule III.

Classification / Actions

Anesthetic agent with NMDA blocking action and other effects producing catatonic-like state
Rapidly absorbed and effective IM or IV route, reserves airway reflexes including the gag/swallow reflex
Has some bronchodilation effect that makes it ideal in reactive airway disease, particularly asthma
May be given at a dissociative or non-dissociative dose depending on intended application

Indications

Chemical restraint, sedation, induction agent for RSI.
Severe pain management (analgesia): primarily in severe trauma.
Medical pain management of known allergy to opioids/narcotics, patient refusal of narcotics, or in Paramedic's clinical judgement the patient will benefit from sub-dissociative dose of Ketamine.

Contraindication

Hypersensitivity/allergy

Side Effects

Hyper- salivation, emergence reaction causing mood alteration, floating sensation, and hallucinations. Commonly in female patients and patients over 16. Can be managed easily with a benzodiazepine.

Administration

Precautions

Use with caution in patients with known hepatic disease

Dosage Form

500-1000mg vials most readily available from most manufacturers

Routes of Administration

IV, IO, IM, IN

Dosages

Adult and Pediatric

<u>Rapid Sequence Induction (RSI)</u>

1-2mg/kg

<u>Post Intubation sedation</u>

0.5-1mg/kg

<u>Chemical restraint</u>

1-2mg/kg, repeat x1 up to 4mg/kg (max 500mg)

<u>Adjunct to Fentanyl (mild to moderate trauma or medical pain management)</u>

Adult/Pediatrics: 0.2-0.6mg (sub-dissociative dose); 1-2mg/kg
For patients <25kg, utilize concentration of 1mg/mL (mix 10 mg Ketamine with NS to a total volume of 10 mL) to allow more accurate volumes of administration.

<u>Major Trauma/Extreme Cases</u>

Adult: 1-2mg/kg (full dissociative dose)
Pediatric: 1mg/kg IV/IO or 4mg/kg IM

Appendix A – Pharmacology

Labetalol (Normodyne, Trandate)

Classification / Actions

Alpha and Beta adrenergic blocking agent

Indications

Hypertensive crisis with signs of end organ disease. BP > 200 systolic or 120 diastolic
Visual problems, sinus headaches, chest pain, or CVA symptoms

Contraindication

Cardiogenic shock
Cardiac failure
Bronchial asthma
Bradycardia
Greater than 1st degree block

Side Effects

Drowsiness
Fatigue
Dizziness
Headache
Hypotension
Tachycardia
Bradycardia
Diarrhea
Dyspnea
Muscle cramping
Fever

Administration

Precautions

Give slowly over 2 minutes

Dosage Form

100 mg in 20 ml vial (5mg/ml)

Routes of Administration

IV, IO

Dosages

Adult

5 - 10 mg IV over 2 minutes; may repeat dose as indicated for targeted blood pressure and/or relief of symptoms

Appendix A – Pharmacology

Lidocaine (Xylocaine)

Classification / Actions

Anti-arrhythmic
Sodium channel blocker
Depresses depolarization and automaticity in the ventricles
Suppresses ventricular ectopy, and increases the ventricle fibrillation threshold
Maintenance infusion for patients successfully converted from VF/pulseless VT (if Lidocaine was primary antiarrhythmic being administered during resuscitation

Indications

Local anesthetic in IO
ACLS guidelines as indicated for VF/pulseless VT

Contraindication

Hypersensitivity/allergy
PVC's with underlying bradycardia
2nd or 3rd degree blocks

Side Effects

Bradycardia
Hypotension
Confusion
Blurred vision
Seizures
Anxiety
Light headedness
Cardiovascular collapse
Altered level of consciousness

Administration

Dosage Form

100 mg in a 10 ml preload syringe

Routes of Administration

IV / IO / IN

Dosages

Adult

VF/pulseless VT

1-1.5 mg/kg

IO anesthetic

40mg

Appendix A – Pharmacology

Lorazepam (Ativan)

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule IV.

Classification / Actions

Most potent of the available benzodiazepines
Targets GABA receptors in the CNS to suppress the spread of seizure activity through the motor cortex of the brain.
GABA receptor binding also plays a role in reducing anxiety

Indications

Major motor seizures
Status epilepticus
Pre-medicate for cardioversion /pacing
Sedation before and after intubation
Fractures with spasms/pain control adjunct
Severe anxiety/claustrophobia
Combative behavior/chemical restraint/emergence reaction
Chest pain secondary to drug use

Contraindication

Known hypersensitivity
Pregnancy (Category D)
Nursing mothers

Side Effects

Drowsiness
Dizziness
Hypotension
Amnesia
Nausea / Vomiting
Respiratory depression

Administration

Precautions

Be prepared to ventilate
Has a 12 to 18 hour half life
Hepatic or renal impairment
May exacerbate certain depressive disorders or psychosis
May potentiate the actions of other benzodiazepines, narcotics and alcohol

Dosage Form

2mg in 1ml vials
4mg in 1ml vials

Appendix A – Pharmacology

Lorazepam (Ativan) – Continued

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule IV.

Administration

Routes of Administration

IV / IO (slow push, dilute if possible)
IM, IN, or rectally

Dosages

Adult

<u>Seizure</u>

1-4mg, may repeat dose up to 10mg

<u>Sedation/acute anxiety/drug induced chest pain</u>

0.5-2mg

<u>Chemical restraint/Emergence reaction</u>

1-4mg

Pediatric

<u>Seizure</u>

0.1mg/kg slow IV push, IM or rectally, repeat dose x1 if needed or move to different benzodiazepine

Appendix A – Pharmacology

Magnesium Sulfate

Classification / Actions

Electrolyte
Anticonvulsant
Anti-arrhythmic
CNS depressant

Indications

Obstetrical
Eclampsia (toxemia of pregnancy)
Cardiovascular
Severe refractory V-Fib, pulseless V-Tach
Torsades de Pointes
Magnesium deficiency
Tricyclic anti-depressant toxicity with specific ECG changes
Status asthmaticus in children

Contraindication

Shock
Heart block
Renal disease

Side Effects

Hypotension
Respiratory depression
Bradycardia
Asystole
Drowsiness
Facial flushing
Diaphoresis
Hypothermia
CNS depression
Cardiac arrest
Diarrhea

Administration

Precautions

After administration check deep tendon reflexes as this is an early sign of magnesium toxicity.

Dosage Form

10%, 12.5%, 50% solutions, single or multi-dose vials

Routes of Administration

IV, IM, IO

Magnesium Sulfate – Continued

Dosages

Adult

Torsades de Pointes

1-2 gm IV slowly

Refractory V-Fib (after max dose Amiodarone or Lidocaine)

1-2 gm IV push

Refractory V-Tach (after max dose Amiodarone or Lidocaine)

1-2 gm IV slowly

Seizure (Eclampsia)

1-4 gm slow IV push (typically controlled infusion)

Pediatric

Status Asthmaticus

25 – 50 mg/kg infusion over 10 minutes

Pulseless arrest

25 – 50 mg/kg max 2 grams

Appendix A – Pharmacology

Methylprednisolone (Solu-Medrol)

Classification / Actions

Synthetic corticosteroid
Anti-inflammatory

Indications

Adrenal insufficiency
Anaphylaxis
Severe asthma
COPD/emphysema
Urticaria (hives)

Contraindication

Hypersensitivity
Otherwise no contraindications, especially for severe anaphylaxis

Side Effects

Fluid retention / congestive heart failure (or worsening of present heart failure)
Hypertension
Abdominal distention
Vertigo
Headache
Nausea
Malaise
Hiccups

Administration

Precautions

Single dose only in pre-hospital care
Long-term steroid therapy can cause gastrointestinal bleeding and prolonged wound healing.

Dosage Form

125mg in mix-o-vial

Routes of Administration

IV, IM, IO

Dosages

Adult

125mg

Pediatric

1-2mg/kg, max 125mg

Appendix A – Pharmacology

Midazolam (Versed)

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule IV.

Classification / Actions

Sedative / hypnotic
Provides conscious sedation / amnesia
Anticonvulsant
Midazolam is a potent, but short acting benzodiazepine used as a sedative
Onset of action is approximately 1 minute via IV and 15 minutes IM
Has no effect on pain

Indications

Patients in need of sedation
Cardioversion and RSI
Head injuries
Seizures

Contraindication

Shock
Known hypersensitivity
Acute narrow angle glaucoma
Use caution if hypotension is present

Side Effects

Hypotension
Bradycardia
Respiratory depression
Headache
Nausea
Vomiting
Altered mental status
PVC's
Drowsiness
Amnesia

Administration

Precautions

Watch of signs of respiratory depression and bradycardia
Patients receiving Midazolam should be continuously monitored with resuscitation equipment readily available

Appendix A – Pharmacology

Midazolam (Versed) – Continued

Walla Walla and Columbia Counties Controlled Medication, DEA Schedule IV.

Administration

Dosage Form

2mg/ml vial or ampule
5mg/ml vial or ampule

Routes of Administration

IV, IM, IO, IN

Dosages

Adult

Seizures

5 -10 mg IV, IM, intra-nasal

Rapid Sequence Induction (RSI)

0.1-0.2mg/kg IV (induction dose)

Sedation

1-5mg, repeat as needed

Emergence reaction

2-5mg

Pediatric

Seizures

0.1– 0.2 mg/kg IV, IO, intra-nasal

Appendix A – Pharmacology

Naloxone (Narcan)

Classification / Actions

Narcotic antagonist reverses respiratory depression associated with narcotic use.

Indications

Coma of unknown origin
Altered level of consciousness
Pin point pupils
Reversal of respiratory depression caused by the following narcotics:

- Morphine
- Demerol
- Heroin
- Paregric
- Dilaudid
- Codeine
- Percodan
- Fentanyl
- Methadone
- Nubain
- Darvon
- Talwin
- Stadol

Contraindication

Known hypersensitivity to drug
Routine use in cardiac arrest or diagnostic use for altered mental status WITHOUT respiratory depression/hypoxia is not recommended or considered good practice

Side Effects

Hypotension
Nausea
Vomiting
Hypertension
Ventricular arrhythmia
Withdrawal symptoms in the addicted patient (seizures, violent behavior)

Administration

Precautions

- Very short half life
- Patient may become violent after administration
- Consider restraints prior to administration
- Should be titrated to patient's respiratory status, not level of consciousness
- Ventilate as needed with 100% O2

Naloxone (Narcan) – Continued

Administration

Dosage Form

0.4 mg in 1 ml vials or ampules
2mg pre-load syringes

Routes of Administration

IV, IM, SQ, and IN

Dosages

Adult

0.4 mg to 2 mg IV, IM, IN
EMS personnel may repeat as needed until respirations are restored up to 10 mg

Pediatric

0.01mg/kg

Nitroglycerin (Nitrostat)

Classification / Actions

Nitrate
A potent smooth muscle relaxant that reduces cardiac work and dilates coronary arteries
Causes vasodilation which reduces preload and afterload

Indications

Chest pain of suspected cardiac origin
Pulmonary edema / CHF
Hypertension

Contraindication

Hypotension
Head trauma
Patients with increase in intracranial pressure (ICP)
Recent administration of Viagra or other erectile dysfunction medication
Patients in shock
Aortic Stenosis

Side Effects

Headache
Fainting
Nausea
Vomiting
Dizziness
Hypotension
Weakness
Dry mouth
Tachycardia

Administration

Precautions

- Perform 12 lead prior to administration
- Have IV in place prior to administration
- Closely monitor blood pressure
- Do not administer to a patient with a systolic blood pressure less than 90
- Light sensitive. Check dates, Nitro deteriorates rapidly

Nitroglycerin (Nitrostat) – Continued

Administration

Dosage Form

0.4 mg sublingual tablet or spray
Transdermal patches / ointments
IV drip for continuous infusion

Routes of Administration

Sublingual
Transdermal
IV drip (IFT only)

Dosages

Adult

0.4 mg sublingually (tablet or spray), up to 3 doses, at least 5 minutes apart if SBP>90.

Appendix A – Pharmacology

Nitrous Oxide (N2O / Nitronox)

Classification / Actions

Analgesic / Anesthetic gas
CNS depressant with analgesic properties
Blended 50/50 mix of nitrous and oxygen that has a potent analgesic effect

Indications

States of anxiety; including hyperventilation
Burns
Musculoskeletal pain secondary to fractures, sprains, dislocations
Often ideal for pediatrics requiring pain control and won't tolerate invasive procedures.

Contraindication

Head trauma
Abdominal pain
Patients that cannot comprehend verbal instructions
Patients severely intoxicated or under the influence of other drugs
COPD patients
Patients with thoracic injuries suspected of having possible pneumothorax

Side Effects

Headache
Confusion
Nausea /Vomiting
Dizziness
Hallucinations
Altered mental status

Administration

Precautions

Administer in well ventilated areas

Dosage Form

Stored in 2 tank system that mixes the gases (Nitrous / O2)

Routes of Administration

Patient self-administered through a mouth piece on demand regulator

Dosages

Adult

Self-administered

Appendix A – Pharmacology

Norepinephrine (Levophed)

Classification / Actions

Peripheral vasoconstrictor (alpha-adrenergic action)
Inotropic stimulator of the heart
Dilator of coronary arteries (beta-adrenergic action)

Indications

Use if patient's blood pressure does not improve with fluid challenge of 30 ml/kg
Acute pulmonary edema or CHF with hypotension
Hypotension / Shock – Blood pressure < 90 (hemorrhagic shock unresponsive to fluid resuscitation)
Anaphylaxis with shock and hypotension

Contraindication

Hypertension
Patients in hypovolemic shock secondary to dehydration
Tachyarrhythmia
Use caution in patients receiving MAOI or antidepressants of the Triptyline or Imipramine types as prolonged hypertension may result
Renal failure and hepatic dysfunction

Side Effects

Pain, burning, irritation, discoloration or skin changes at injection site
Sudden numbness, weakness, or cold feeling anywhere in your body

Administration

Dosage Form

Mix 2-4mg in 250 or 500ml bag of D5W (preferred) or NS, utilize appropriate drip set and drip charts to ensure appropriate infusion rate, IV pump is preferred if available.

Routes of Administration

IV drip, preferably with a pump

Dosages

Adult

2-4mcg/minute, titrate to SBP>90, up to 30 mcg/minute

Appendix A – Pharmacology

Ondansetron (Zofran)

Classification / Actions

Anti-emetic, anti-nausea
Blocks serotonin type 3 receptors in the CNS to prevent activating the vomiting center
Onset unknown, peak 6 – 20 minutes

Indications

Nausea
Vomiting
Gastroesophageal reflux (dry heaves)
Prophylaxis for side effects of pain medications (Fentanyl)

Contraindication

Sensitivity to the drug
Use cautiously in those with hepatic impairment

Side Effects

Headache
Sedation
Malaise
Fatigue
Dizziness
Fever
Anxiety
Agitation
Diarrhea
Constipation
Chest pain
Hypotension
Bronchospasm
Dysuria
Rash
Pruritus

Administration

Precautions

Given slowly over 2 minutes if given IV

Appendix A – Pharmacology

Ondansetron (Zofran) – Continued

Administration

Dosage Form

4 mg in 2 ml single dose vial
4mg or 8mg ODT (oral disintegrating tablet)

Routes of Administration

IV, IM, ODT

Dosages

Adult

4 mg IV over 2 to 5 minutes may repeat 4mg x1 after 5 minutes if symptoms persist
4 mg IM
4-8mg ODT

Pediatric

0.1 mg/kg for children 1 month to 12 years who weigh 40 kg or less

Appendix A – Pharmacology

Oxygen (O_2)

Classification / Actions

Gas
Oxygen is an odorless, tasteless, colorless gas necessary for life
Enters body through the respiratory system and is carried to the cells of the body through hemoglobin in the red blood cells
Oxygen is required for the breakdown of glucose into a usable energy form
Onset of action is immediate
Reduces the size of infarcted tissue during an AMI
Increases oxygen saturations in the blood stream

Indications

Hypoxia
Chest pain
Any respiratory difficulty
During active labor
Major trauma and medical events

Contraindication

Use with caution for COPD patients
SPO2>94%

Side Effects

None

Administration

Precautions

Do not use near open flames or other heat sources
Use caution when administering to a COPD patient as their respiratory drive has been compromised

Dosage Form

Stored in pressurized tanks
Tank will have a regulator with flow meter

Routes of Administration

Nasal cannula, non-rebreather, bag valve mask, or CPAP

Appendix A – Pharmacology

Oxygen (O2) – Continued

Dosages

Adult/Pediatric

- Low flow O2
  - Patients with oxygen saturations greater than 94% or COPD patients
- High flow O2
  - Trauma with suspected blood loss
  - Oxygen saturations below 95%
  - Smoke, carbon monoxide, or toxic gas inhalation
  - Respiratory distress
  - Unresponsive patients
  - OB patients with known or suspected complications

Delivery Method	Liters Per Minute	Percentage of Oxygen Delivery
Nasal Cannula	1 to 6 liters/minute	24 – 44 %
Non-Rebreather	6 to 15 liters/minute	60 – 95%
Bag Valve Mask	10 to 15 liters/minute	40 – 90%

Appendix A – Pharmacology

Oxytocin (Pitocin)

Classification / Actions

Pituitary hormone
Causes contraction of uterine smooth muscles
Used for post-partum hemorrhaging

Indications

Severe post-partum hemorrhaging
Following a miscarriage or abortion with severe vaginal hemorrhaging
Contact Medical Control <u>prior</u> to administration

Contraindication

Ensure there are not multiple births
Administer after the placenta has delivered

Side Effects

Hypotension / Hypertension
Angina / Chest Pain
Tachycardia / Dysrhythmias
Nausea / Vomiting
Anxiety / Seizures

Administration

Precautions

Excess Oxytocin can cause over-stimulation of uterus and cause uterine rupture
Use after fundal massage

Dosage Form

10 units in 1 ml vial

Routes of Administration

IM
IV infusion

Dosages

Adult

10 units IM after placenta delivery
Following IM injection start IV infusion, 10 units mixed into 1,000 ml bag of NS
Infused at rate of 20 to 30 gtts/minute (TKO), titrated to severity of hemorrhaging

Appendix A – Pharmacology

Rocuronium (Zemuron)

Classification / Actions

Long acting skeletal muscle relaxant used to facilitate endotracheal intubation
Non-depolarizing neuromuscular blocker
Onset of 60 to 90 seconds, duration of 45 minutes

Indications

When endotracheal intubation is required to secure an airway
RSI
Long term paralyzing agent for long transports

Contraindication

No relative contraindications

Side Effects

Anaphylaxis
Prolonged apnea, respiratory depression, or bronchospasm
Inability to perform adequate neurological exam
Hypertension or hypotension
Cardiac dysrhythmia
Tachyarrhythmia

Administration

Precautions

Should not be administered unless qualified person is ready for endotracheal tube placement
All other RSI medications are ready for administration such as Fentanyl, Midazolam, Etomidate, Lorazepam, and Ketamine
Shelf life upon removal from refrigeration is 60 days
Pre-oxygenate the patient with 100% O2

Routes of Administration

IV / IO (preferred)

Dosages

Adult

1mg/kg IV / IO
Maintenance dose after 30 minutes of 0.5mg/kg

Pediatric

1mg/kg
Maintenance dose after 30 minutes of 0.5mg/kg

Appendix A – Pharmacology

Sodium Bicarbonate

Classification / Actions

Alkalinizing agent
Acts as a buffer to metabolic acidosis (increases pH) which can accompany many different disease processes, toxicological emergencies, and injuries (crush injury/rhabdomyolysis).

Indications

TCA overdose
Hyperkalemia
ROSC with acidosis uncorrected by ventilation
Crush injury
Late in cardiac arrest if ordered by Medical Control

Contraindication

No relative contraindications

Side Effects

Few side effects if used appropriately in the emergency setting

Administration

Precautions

Can cause metabolic alkalosis when administered in large quantities. It is important to calculate dosage appropriately based on patient weight.
Should not be administered in conjunction with calcium chloride, a precipitate can form which may clog the IV line.

Routes of Administration

IV / IO

Dosages

Adult and Pediatric

1mEq/kg IV / IO, 0.5mEq/kg every 10 minutes as indicated.

Appendix A – Pharmacology

Succinylcholine (Anectine, Quelicin)

Classification / Actions

Short acting skeletal muscle relaxant used to facilitate endotracheal intubation
Depolarizing neuromuscular blocker
Onset of 30 to 60 seconds, duration 4 to 6 minutes
Enables muscles to be stimulated by acetylcholine

Indications

When endotracheal intubation is required to secure an airway
RSI

Contraindication

Patients with penetrating eye injury
Patients with neuromuscular disease (MS, MDS, Paraplegic, Quadriplegic)
Burns, multiple traumatic and soft tissue injuries > 24 hours old

Side Effects

Dysrhythmias
Prolonged apnea, respiratory depression, or bronchospasm
Increased intracranial pressure (ICP)
Inability to perform adequate neurological exam
Hypertension or hypotension
Increased intraocular pressure
Fasciculation

Administration

Precautions

Should not be administered unless qualified person is ready for endotracheal tube placement
All other RSI medications are ready for administration such as Fentanyl, Midazolam, Etomidate, Diazepam, Lorazepam, and Ketamine
Shelf life upon removal from refrigeration is 30 days
Pre-oxygenate patient with 100% O2
Fasciculations

Routes of Administration

IV (preferred)
IM (onset 2-3 minutes)

Dosages

Adult and Pediatric

1 to 2 mg/kg IV
3 to 4 mg/kg IM to a max 150 mg

Appendix A – Pharmacology

Tranexamic Acid (TXA)

Classification / Actions

Fibrinolysis inhibitor

Indications

Adult trauma patients 16 years of age or greater
Traumatic injury <3 hours old
Signs and symptoms of hemorrhagic shock
Massive gastrointestinal bleeds
Ruptured esophageal varices
Post-partum hemorrhage, contact medical control

Contraindication

Adult trauma patients <16 years of age
Traumatic injury >3 hours old

Side Effects

Few side effects if used appropriately in the emergency setting

Administration

Precautions

Use caution if patient has known history of thrombotic disorder such as DVT or PE

Routes of Administration

IV, IO

Dosages

Adult >16

1 gram mixed in 100 or 250ml bag of NS or D5W administered over 10 minutes, preferably via IV pump if available, but may also be administered via standard 10gtt set – calculate and maintain appropriate drip rate.

Appendix B – Community Paramedicine

Indication

EMS agencies licensed under **RCW 18.73** may establish a Community Assistance Referral and Education Services (CARES) program under **RCW 35.21.930**, commonly referred to as a Community Paramedicine program.

Agencies with established Community Paramedicine programs realize the traditional EMS response and transport to an Emergency Department may not be the appropriate level of care for all patients. Community Paramedicine programs may when safe and appropriate refer patients to local providers, social service providers, or alternative destinations to better meet the patient's needs.

All prehospital EMS providers allowed to operate as part of a Community Paramedicine program in Columbia or Walla Walla Counties are authorized to operate under current ALS, BLS, or ILS protocols, as is appropriate to their certification level and scope of practice.

Medical Control

Community Paramedics may seek online medical direction from other providers to facilitate better care outside traditional EMS services.

If there is confusion regarding the patient's medical needs and treatment, the Community Paramedic should rely on transport to the Emergency Department.

Other providers may include:

- Primary Care Provider
- Emergency Department Physician
- Physician Assistant (PA)
- Advanced Registered Nurse Practitioner (ARNP)
- Mental Health Provider (MHP)
- Social Worker (BSW, MSW, DSW, LSW)
- Designated Crisis Responder (DCR)
- RN Case Managers

Alternative Destinations

Alternative destinations to meet a patient's medical or mental health care may include:

- Emergency Department – If ambulance transport is not necessary, however Emergency Department care is needed to appropriately meet the patient's treatment, procedure, or medication needs.
- Urgent Care, Express Care, or Walk in Clinics
- Primary Care Providers
- Mobile Clinics
- Substance Abuse Treatment Facilities
- Mental Health Clinics

Transportation may also be arranged to agencies that can assist with providing a patient's basic human needs, such as assistance with food, water, shelter, clothing, employment, or safety.

Appendix B – Community Paramedicine

Indication

This protocol is to be utilized by Community Paramedics as standing orders for patients enrolled in an approved Mobile Integrated Health (MIH) program.

The primary point of contact for all patient consultations is the patient's Primary Care Provider (PCP), MIH Medical Director, or Case Manager.

Referral Criteria

Patients may be considered "high utilizers" and referred to the Community Paramedicine Program if they meet the following criteria:

- Referred by PCP, Case Management, or Population Health for avoidable Emergency Department visits during the past 12 months.
- Has had three or more EMS activations in a one-month period.
- Has become a noticeable interruption to emergency telecommunications due to abusive and inappropriate usage of 9-1-1.
- Resides in Columbia or Walla Walla Counties.
- Possesses the mental capacity to support navigational assistance.
- Willing to participate in the Community Paramedicine Program.

Initial Home Visit / Patient Assessment

During the initial home visit the Community Paramedic will determine if there are any barriers to the patient's care, which may include:

- Living environment
- Social barriers preventing appropriate engagement to care
- Transportation
- Access to PCP
- Disease Management

The Community Paramedic will also facilitate the development and implementation of a care plan by case management and PCP, which may include:

- PCP assignment
- Series of visits to educate patient, family, and/or caregiver on appropriate care management and treatment plan implementation.
- Assistance navigating patient through patient's PCP and available resources.
- Provision of non-emergency number and contact information to request Community Paramedic support during the duration of the community paramedic programs' involvement in care.

Scheduled Home Visits

Enrolled patients will receive a series of home visits to provide the following education to themselves, their family, or their caregiver:

- Appropriate usage of 9-1-1 and Emergency Department resources
- Appropriate ways to manage their disease process
- Positive reinforcement of care plan implementation
- Assistance in navigating the healthcare system and local resources

Appendix B – Community Paramedicine

Unscheduled Home or Telehealth Visits

The patient will be provided with non-emergency contact information for the Community Paramedic in the event the patient would like a phone consultation or an unscheduled home visit between scheduled visits rather than calling 9-1-1 to request and ambulance.

Telehealth visits utilizing the Community Paramedicine Doxy.me account is another alternative. This account can be accessed at **https://doxy.me/wwfdcommunityparamedic**.

Appendix B – Community Paramedicine

Treat and Refer

Indication

To be utilized by CARES programs meeting the requirements of **RCW 35.21.930** and participating in the **Ground Emergency Medical Transportation (GEMT)** program.

Special Considerations

Treat and Refer programs aim to reduce the number of avoidable non-urgent emergency department transports.

Treat and Refer services are covered health care services for patients that have accessed 911 or a similar public dispatch number and do not require ambulance transport based on available clinical information at the time of service.

Treat and Refer providers must bill services according to the current guidelines as established by the Washington State Health Care Authority found under "**Ambulance transportation**".

Documentation Considerations

Providers shall thoroughly document the patient's history, the reason for the referral, and the agency the patient is referred to.

All documentation will be in accordance with **WAC 182-502-0020**.

Appendix B – Community Paramedicine

Pharmacology

Approved medications for Paramedics in Columbia and Walla Walla Counties operating as part of a Community Paramedicine program.

Indication

Community Paramedics may ASSIST patients enrolled in an approved Mobile Integrated Health (MIH) program with administration of the following Patient Prescribed medications.

Aripiprazole Parenteral (Abilify)
Fluphenazine Decanoate (Prolixin)
Naltrexone (Vivitrol)
Paliperidone Palmitate (Invega)
Risperidone (Perseris)

Special Considerations

The above medications require MPD specialized training on administration prior to EMS providers being authorized to administer these medications in the field.

Appendix B – Community Paramedicine

Aripiprazole Parenteral (Abilify)

Classification / Actions

Atypical antipsychotic.
Modulated neurotransmission overactivity of dopamine.

Indications

Must be prescribed by the patient's Primary Care Provider for:

1. Schizophrenia
2. Bipolar Disorder

Contraindication

Allergy to Aripiprazole or any of its components.
Pregnant or breastfeeding.

Side Effects

Injection site pain
Akathisia
Sedation

Administration

Precautions

Must be reconstituted and warmed to room temperature before administration.
Follow instructions for use of syringe as prescribed with sterile water.
Use caution when administering to a patient with suicidal ideation.

Dosage Form

Prefilled dual chamber syringe 300 or 400 mg.
Vials containing 300 or 400 mg dosing.

Routes of Administration

IM

Dosages

Adult

Administer dosage per prescription label via IM injection in the deltoid or gluteal muscle.
Alternate injection site monthly.

Appendix B – Community Paramedicine

Fluphenazine (Prolixin)

Classification / Actions

Typical antipsychotic.
Dopamine antagonist.

Indications

Must be prescribed by the patient's Primary Care Provider for:

1. Schizophrenia
2. Bipolar Disorder

Contraindication

Allergy or hypersensitivity to Fluphenazine or other Phenothiazines.
Patients taking large doses of CNS depressants.
Have suspected or documented brain damage or hardening of the arteries in the brain.
Comatose or severely depressed states.
Blood dyscrasia or liver damage.
Children under 12 years of age.

Side Effects

Injection site pain
Sedation
Dizziness
Nausea
Sweating
Dry Mouth
Blurred Vision
Headache
Constipation

Administration

Precautions

There is an increased risk of death in older adults who take the Fluphenazine Decanoate injection for mental problems caused by dementia.
Use caution when administering to a patient with suicidal ideation.

Dosage Form

Vials containing 125 mg / 5 mL (25 mg/mL)

Routes of Administration

IM

Dosages

Adult

Administer dosage per prescription label via IM injection in the deltoid or gluteal muscle.
Alternate injection site monthly.

Appendix B – Community Paramedicine

Naltrexone (Vivitrol)

Classification / Actions

Opiate antagonist.

Indications

Must be prescribed by the patient's Primary Care Provider for:

1. Alcohol Dependence
2. Opioid Dependence

Contraindication

Opioid use within the last seven (7) days
Pregnant or breastfeeding

Side Effects

Opioid withdrawal
Opioid overdose
Injection site reaction
Liver failure

Administration

Precautions

Must be reconstituted and warmed to room temperature before administration.
Use caution when administering to a patient with suicidal ideation.

Dosage Form

Supplied in vials containing 380 mg of powder and second vial containing 3.4 ml of diluting solution. Reconstituted the volume is 4.2 ml.

Routes of Administration

IM

Dosages

Adult

380 mg gluteal IM injection monthly, alternating glute each month.

Appendix B – Community Paramedicine

Paliperidone Palmitate (Invega)

Classification / Actions

Atypical antipsychotic.
Dopamine and Serotonin antagonist.
Antagonizes other neurotransmitter receptors.

Indications

Must be prescribed by the patient's Primary Care Provider for:

1. Schizoaffective disorder
2. Schizophrenia

Contraindication

Hypersensitivity to Respiridone.
Congenital Prolonged QT syndrome.
Dysrhythmia history.

Side Effects

Injection site reaction
QT prolongation
Dystonia

Administration

Precautions

Use caution when administering to a patient with bradycardia, hypovolemia, or in a high environmental temperature.

Dosage Form

Invega Sustenna is prescribed monthly in the following doses: 39 mg, 78 mg, 117 mg, 156 mg, or 234 mg.
Invega Trinza is prescribed every three (3) months following ≥ four (4) months of adequate treatment with Invega Sustenna. Invega Trinza is prescribed at the following doses: 273 mg, 410 mg, 546 mg, 819 mg, or 234mg.

Routes of Administration

IM

Dosages

Adult

Administer dosage per prescription label via IM injection in the deltoid or gluteal muscle.
Alternate injection site monthly.

Appendix B – Community Paramedicine

Risperidone (Perseris)

Classification / Actions

Atypical antipsychotic.
Dopamine and Serotonin antagonist.

Indications

Must be prescribed by the patient's Primary Care Provider for:

1. Schizoaffective disorder
2. Bipolar Disorder

Contraindication

Allergy or hypersensitivity to Risperidone, its metabolite, Paliperidone, or to any of its components.
Elderly patients with dementia-related psychosis.

Side Effects

Injections site pain
Headache
Dizziness
Sedation
Uncontrollable muscle movements
Depression
Agitation
Anxiety
Restlessness
Muscle or joint pain
Dry mouth
Upset stomach
Constipation
Weight gain
Pain in your arms or legs

Administration

Precautions

Must be reconstituted and warmed to room temperature before administration.
Use cautiously in patients with a history of seizures or with conditions that lower the seizure threshold.
Use caution when administering to a patient with suicidal ideation.

Dosage Form

90 mg/0.6 mL or 120 mg/0.8 mL, maximum monthly dose is 120 mg.

Routes of Administration

IM

Dosages

Adult

Administer dosage per prescription label via IM injection in the deltoid or gluteal muscle.
Alternate injection site monthly.