

WHATCOM COUNTY ALS & BLS PROTOCOLS & TRANSPORT GUIDELINES



Revised: 04/2020

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Receipt of Protocols

TO: Marvin A. Wayne, M.D.
Whatcom County Medical Program Director

SUBJECT: Whatcom County BLS and ALS EMS Protocols (2020 Edition)

The purpose of this memo is to inform you that I have received the EMS Protocols. I have reviewed these protocols and will abide by their direction. I understand that ALS providers are responsible for knowing and following these protocols in their entirety and BLS providers are responsible for all BLS protocols (not highlighted in pink or blue).

If signing as a representative of an EMS agency or provider supervisory organization, I attest that responders in my organization will be trained in and adhere to these guidelines.

Signature

Printed Name and Title

Agency

Date

(May be submitted electronically)

**Medical Program Director's Copy
Return to WCEMSTCC Office**

ADDENDUM AND REVISION LOG

Instructions: On receipt of a protocol update place it in the appropriate section, remove outdated text then record below.

Revision	Date	Section and Page #'s	(N) new (R) revised (D) deleted	Entered and Reviewed by (Employee Initials)
1. Reformatted ALS & BLS combined	4/8/2020		R	
2. Succinylcholine	4/8/2020		D	
3. OB Section	5/26/2020	Pg46 - 49	N	
4. Alphabetize D- H	5/26/2020	Drowning – Hypo pg38 - 46	R	
5. Consistency Errors Fix	5/26/2020		R	
6.				
7.				
8.				
9.				
10.				

Introduction - EMS Protocols

Authorization for EMS personnel to provide pre-hospital medical care comes directly from the State approved Medical Program Director.

These protocols serve as the guidelines for EMRs, EMTs, and paramedics working in Whatcom County, and may be used by EMS organizations operating in Whatcom County by agreement with the MPD. All EMS personnel are required to use the protocols appropriate to their certification level. In cases of mutual aid when an emergency is declared through official channels outside of Whatcom County, these protocols become portable. When an incident occurs beyond the normal capacity of our system (MCI), normal procedures may be superseded and BLS providers may be utilized to transport ALS patients.

This document is to be considered a set of standing orders or off-line permission to act. These protocols are not absolute treatment doctrines. They are guidelines with the flexibility to meet the complex challenges faced by the EMS provider in the field. The MPD delegates daily authorization for pre-hospital patient care and decision making to the on-line medical control physician on duty at PeaceHealth St. Joseph Medical Center's Emergency Department (360-715-4149 Direct Line to Medical control). At any time, the responder is not certain that a patient or situation meets the criteria set forth, responders may contact Medical Control for guidance or to obtain on-line permission to act. In certain unusual situations, procedures not outlined here may be approved or ordered by Medical Control. If unable to reach Medical Control in rare circumstances, EMS personnel should document this carefully and do what they feel is best for the patient. Throughout this document, Medical Control refers to the on-duty Emergency Department Physician (Star Doc), or the MPD or Supervising Physician for each agency.

Whatcom County Medical Program Director along with the EMS and Trauma Care Council have approved the following as standard for EMS agencies in Whatcom County:

- ResQPOD as the standard Impedance Threshold Device
- ResQPump as the standard Active Compression Decompression Device
- IGEL as the standard Supraglottic Airway
- LUCAS as the standard Mechanical Compression Device

**Exceptions must be approved by the MPD:

These protocols shall replace and supersede all prior EMS Protocols in Whatcom County.

RESPONSIBILITY OF PRE-HOSPITAL PERSONNEL

1. Once EMS personnel are dispatched to a scene, they assume legal authority for patient management under the direction of the medical control physician in the ED.
2. The EMS provider's primary responsibility is to the patient.
3. Treat offers of help from non-EMS providers professionally and respectfully.
 - a. Request and document identification – a current medical license, medical specialty ID card, or hospital ID are acceptable.
 - a. If the physician is present, has appropriate specialization for the patient's complaint, and is willing to assume responsibility for the patient's care, you may defer to the physician's orders, unless they conflict with these protocols. Document the physician's orders and acceptance of responsibility on the patient care report.
 - b. To resolve conflicts, contact Medical Control and arrange telephone consultation between the physicians.
 - c. If the physician is not willing to accompany the patient to the hospital, responsibility reverts to the medical control physician.

BLS ADMINISTRATION OF MEDICATIONS

EMTs may administer or assist patients with administration of the following medications as permitted by State policy. BLS providers must have received specialized training in order to administer Albuterol, Activated Charcoal, Epinephrine, Nitroglycerine, and Nitrous Oxide.

Acetaminophen
Activated Charcoal
Aspirin
Epinephrine IM
Metered Dose Inhalers (MDIs) and nebulized Albuterol
Naloxone by nasal administration
Nitroglycerine
Nitrous Oxide
Supplemental Oxygen

1. Confirm medication is not expired prior to administration
2. Nitroglycerine and bronchodilators should have been prescribed by a provider in the past
3. Acetaminophen, aspirin, epinephrine, and naloxone do not require prior prescriptions.
4. Activated charcoal should be recommended by Medical Control or WA State Poison Control (1-800-222-1222) prior to administration.
5. If in doubt, contact medical control.

INITIAL PATIENT ASSESSMENT

Primary Survey

1. Airway - assess for obstruction, gag reflex and aspiration risk. Consider oral airway, nasal airway, supraglottic airway or intubation as needed.
2. Breathing - rate and quality. Ventilate with BVM as needed, taking care not to hyperventilate.
3. Circulation – HR, blood pressure, pulses, capillary refill, cyanosis. Control external bleeding.
4. Obtain and record vital signs as indicated by patient condition, including heart rate, blood pressure (indicate patient's position), respiratory rate, temperature, skin color, GCS (or AVPU system or another indicator of level of consciousness), blood glucose, SpO₂, and ETCO₂.

Secondary Survey

1. Expose the patient and perform a head-to-toe assessment.
2. Obtain a brief history from the patient, family and bystanders. Check for medical alerts and POLST forms.
3. Ask all patients about allergies and do not administer these medications unless necessary to treat a life-threatening condition.
4. Place the patient in a position of comfort.
5. Bring relevant drug containers and notes for transport with patient.
6. Reassure the patient and keep him/her informed about treatment.

Communications

1. Contact medical control for advice regarding treatment plan, when treatment not included in these protocols is considered in the patient's best interest, or when considering an unusual disposition.
2. Advise the ED Charge Nurse early of patient transport for STEMI, major stroke or stroke within 4 hours of last known normal, major trauma, multiple consecutive patients, airway issues, or other critical patients.
3. In radio or telephone information to Medical Control or ED Charge Nurse, identify:
 - a. Transporting unit.
 - b. Patient's age, sex, and chief complaint.
 - c. Vital signs, level of consciousness, and physical assessment findings.
 - d. Pertinent history (medications, illnesses, allergies, mechanism of injury, etc.).
 - e. Treatment given and patient's response.
 - f. Patient's full name and birth date.
 - g. Estimated time of arrival (ETA).
4. Advise ED of significant changes in patient's condition during transport.
5. On arrival, give a verbal report to ED nurse and/or physician.

ALS INDICATORS FOR ALL PATIENTS

1. Patients with any of the following require an ALS evaluation, though ALS may determine that the patient is appropriate for BLS transfer:
 - a. Decreased LOC
 - b. Airway compromise
 - c. Respiratory distress or rate over 30 breaths per minute
 - d. Signs and symptoms of shock which include:
 - i. Weak distal pulses, poor capillary refill, cyanosis, pale or diaphoretic skin
 - ii. Sustained tachycardia (Heart rate over 100 beats per minute)
 - iii. Hypotension (systolic BP less than 90 mmHg) unless normal for the patient
 - e. Chest pain or discomfort
 - f. Blood pressure over 180 systolic or 110 diastolic
 - g. Significant Trauma/Mechanism of Injury (MOI)
 - i. Penetrating trauma to the head, neck, chest, abdomen, pelvis or groin
 - ii. Multi-system trauma or fractures at more than one location
 - iii. MVC—death in same vehicle, high speed, significant vehicle deformation, auto vs pedestrian, or ejection or separation from the vehicle
 - iv. Falls greater than two times body height
 - v. Thrown greater than 10 - 15 feet
 - vi. Extremity trauma with pulse deficit
 - h. Significant pain
 - i. Extreme anxiety and agitation
 - j. Ongoing non-minor bleeding
 - k. Active seizure or multiple seizures within 24 hours
 - l. EMT's Index of Suspicion (IOS) that the patient is sick or on EMT request
2. BLS units should consider transport to the ED or to rendezvous with an ALS unit if there is going to be a significant delay until ALS arrival
3. Generally, any patient that has had an ALS procedure performed should be transported by the ALS unit. Exceptions may occur when a saline lock is present and a trained BLS provider will be transporting, or with consent of medical control.

BLS UNITS TRANSPORTING CODE RED

1. Studies show transport with lights and sirens only save seconds to minutes, which are usually not clinically significant. However, BLS may transport Code Red when patient condition would benefit from getting to definitive care sooner than later, for example, for stroke with no airway compromise.

LEFT AT SCENE AND NON-EMS TRANSPORT

1. EMS is only required to transport willing patients in need of urgent medical care.
2. Transport by POV or by taxi voucher may be arranged in willing non-emergent patients requiring medical care who can ambulate independently.
3. If medical needs are not thought to be urgent, EMS providers may help a patient secure an appropriate outpatient appointment and transportation. EMS providers must give patient careful instructions about when to call back to 911 and patient must be able to understand the instructions.
4. If a patient is requesting EMS transport but EMS providers feel the patient does not have urgent medical needs or require EMS transport, EMS should transport or discuss with medical control.
5. Documentation on any patient left at scene, or transported by means other than EMS, should include a thorough history and examination, to include a full set of vital signs, a clinical impression, a summary of the discussion with the patient, and/or family, and a plan for follow-up. Also, an assessment of the patient's capacity to make decisions and care for themselves.
6. Notify the ED Charge Nurse when alternative transport is arranged to the ED.

REFUSAL OF CARE

1. Patients may refuse care and transport if they are competent and meet the following criteria:
 - a. Age 18 or older, or an emancipated minor with legal documentation or a marriage license.
 - b. Minors: Law enforcement or a competent adult legal guardian may sign and accept custody of the patient, unless condition is life-threatening.
 - c. Patient has normal mental status, demonstrates rational decision making, and is not impaired by drugs, medications, alcohol, hypoxia or hypoglycemia.
 - d. Patient (or parental guardian for minors) can understand and repeat back the risks and potential consequences of refusing care.
 - e. Patient has not made an attempt to and denies wishing to hurt themselves or others.
2. Contact medical control if serious health concerns exist and the patient is not willing to be transported.
3. Medical care cannot be refused for potentially life-threatening conditions for a minor or an incompetent adult.
4. Complete the Refusal of Care/Transport form, including witnesses if possible. Document in the ePCR the patient's mental status and the specific advice given about the risks of refusing care or transport, alternatives for obtaining care, and when to call 911.

WRITTEN REPORTS (EPCR)

Following all calls with patient contact, whether there is or is not a transport, an ePCR form is to be filled out completely. The EMT/FR in charge of patient care will document their report on an Electronic Health Record. In the case that ImageTrend is not available, documentation may be done on a State of Washington DOH Medical Incident Report or another MPD-approved form. These reports will be reviewed and utilized as necessary for continuing education, quality assurance, and statistical information. The general rule is, **“if it isn’t written down, it wasn’t done.”**

The narrative portion of the ePCR will be formatted consistent with the S.O.A.P. or similar format:

1. **S = SUBJECTIVE:** Include information you have received from dispatch, law enforcement, bystanders, family members, and the patient, as well as scene observations. This will include:
 - a. The age, sex and chief complaint of the patient
 - b. Events that led to the event, mechanism of injury in the case of trauma, symptoms reported and pertinent negatives
 - c. Pertinent past medical history, medications, and allergies
2. **O = OBJECTIVE:** Information that you and/or your team personally see, hear, feel or smell from performing a patient assessment. Vital signs including heart rate, blood pressure, oxygen saturation, and respiratory rate should be documented on every patient, and temperature and blood glucose when pertinent to the symptoms described. The exam otherwise should include findings pertinent to the chief complaint, such as:

Neuro:	GCS, orientation, strength, sensation HEENT: Head, Ears, Eyes, Nose and Throat
Spine:	Cervical, Thoracic and Lumbar spine
Chest:	Heart murmurs and regularity, lung sounds
Abdomen:	Tenderness, distension, masses
Pelvis:	Laxity on lateral compression of the iliac wings
Extremities:	Tenderness, deformities, pulses, edema
Skin:	Bruising, bleeding, crepitus, capillary refill, warmth

3. **A = ASSESSMENT:** What your best impression is as to what is wrong with the patient. When stating/writing your impressions, preface them by **“possible”** or **“rule out”**, unless the injury or illness is obvious, e.g.: fracture.
4. **P = PLAN:** Include the actual treatments/interventions that were performed and the response to the treatment, any changes in patient condition while in your care, and the disposition (where did you leave them and in what kind of condition). Please document any conversations with Medical Control, including the provider’s name and the time.

REPORTING TIMELINE

Reports should be completed as proximate to the call as possible and should not be delayed except for another call. Patients transported to the ER must have reports written within 6 hours. For other patients, reports should be completed within 12 hours after the call.

ADVANCE HEALTH CARE DIRECTIVE

1. Consult and follow the following legal documents for guidance on life-sustaining care:
 - a. Durable Power of Attorney (DPA).
 - b. Physician Orders for Life Sustaining Treatment (POLST).
 - c. Advanced Directive.
2. The patient may change their wishes from these directives at any point.
3. Comfort measures may still be initiated, including oxygen, IV lines and medications.
4. When doubt or confusion exists:
 - a. Attempt to determine document validity by contacting the patient's personal physician or the ED Charge Nurse.
 - b. Contact medical control.
5. Please attach a photo of the above documents to the ePCR.

INITIATION AND TERMINATION OF RESUSCITATION

1. If any of the following conditions are present, do not initiate CPR:
 - a. Valid advanced directive indicating no resuscitation.
 - b. Cardiac arrest in the field due to blunt trauma.
 - c. Decapitation, total incineration, or obviously nonsurvivable injuries (i.e., extruded brain material).
 - d. Decomposition, patient is cold in a warm environment, dependent lividity or rigor mortis.
 - e. Underwater submersion for 2 or more hours (consider extending 2-hour time if water temperature near freezing).
 - f. Mass casualty situation where triage principles preclude CPR from being initiated on every victim.
 - g. Patient has a terminal illness and next of kin requests not to perform CPR.
2. If there is any doubt about the above criteria, the patient should be immediately resuscitated while relevant factors and patient condition are further assessed. If there is disagreement among family, begin CPR.
3. Termination of resuscitation:
 - a. Discuss with medical control whenever possible after 15 minutes of ALS resuscitation for advice on treatment, termination or transport.
4. When leaving a patient in the field after an unsuccessful resuscitation
 - a. Call local law enforcement to the scene unless the patient resides in a skilled nursing facility or is enrolled with hospice with a No Jurisdiction Assumed (NJA) number assigned by the medical examiner's office.
 - b. If patient is under hospice care, contact hospice at 733-5877 and contact the nurse on call. If no contact is made within 20 minutes, then recall and ask for the administrator on call. If both of these fail, then contact law enforcement agency to assist.
 - c. If patient is at a skilled nursing facility or other healthcare facility, call the on-call or chief administrator to see if they have an alternate process other than contacting law enforcement.
 - d. Do not remove EKG pad/patches, ET tube, IV, IO or other EMS interventions. Mark all sites of IV/IO attempts in ink with agency initials.
 - e. Consider calling Support Officers to assist with family/friends.
 - f. If the circumstances are suspicious, follow the Crime Scene Protocol.
 - g. An EMS responder or appropriate individual must stay on scene until the arrival of local law enforcement.

HELICOPTER TRANSPORT

1. Helicopter transportation may be called from the field for:
 - a. Critical patients with delay to ALS arrival (i.e., over 30 min) or with a long transport time to the receiving hospital. Critical patients may include:
 - Multisystem trauma with hypotension, airway compromise, or uncontrolled bleeding
 - Head injury with decreased LOC
 - Amputation with potential for re-implantation
 - Spinal cord injury with neurologic impairment
 - STEMI
 - TPA-eligible stroke
 - Resuscitated Cardiac/Respiratory Arrest
 - Complications of pregnancy after 24 weeks
 - Older adults with acute abdominal pain and hypotension
 - b. Patients that may benefit from immediate blood products.
 - c. Mass casualty incidents, when the number of patients overwhelm resources on scene or at the receiving hospital.
 - d. Patients requiring a special destination for treatment (i.e. Harborview Burn Center or Seattle Children's Hospital) in agreement with the transport destination protocol below
 - e. Scenes where ground access is limited.
2. Transport Destination.

All helicopter transports shall be directed to St. Joseph Medical Center in Bellingham unless an alternate destination is discussed with and advised by Medical Control.

Procedure:

The normal procedure for dispatching an Air Medical Service should be to:

1. Consult with responding ALS ground ambulance about patient condition and need to fly.
2. Contact Prospect (or have medic unit do so) and request Air Medical Service to be dispatched.
3. The following information will need to be provided:

Patient Weight

Brief patient report

Landing Zone GPS Coordinates, Map Coordinates, and/or Totem map page and cross streets or landmarks

Unit Radio Identification for Ground Contact (recommend an alternate radio frequency than for patient care)

4. Caller should request ETA and aircraft number.

The personnel transferring patient care to the AirLift team shall communicate with medical control as soon as possible to provide patient condition and ETA.

ASSESSING CAPACITY

Competent Adults

1. Competent adults have the right to refuse medical care in most circumstances.
 - a. You must first determine if the patient is competent to refuse care.
 - b. The patient must be greater than 18 years of age or a documented emancipated minor.
2. Attempt to convince the person of the need for medical care, including possible consequences of not seeking care. Solicit assistance from friends and family.
3. If serious health concerns exist and the patient is not willing to be transported, contact medical control to discuss the situation. Inform the patient of the physician's recommendation.
4. Complete the Refusal of Care/Transport form for any patient refusing recommended medical care. Include witnesses, if possible. Document facts in the ePCR; include an explanation given to the patient regarding their medical issues and the potential consequences of no transport/treatment.

Incompetent Adults

1. Patients impaired by drugs, medications, alcohol, hypoxia or hypoglycemia, or who demonstrate inability to make rational judgments regarding their care are not considered competent.
2. EMS personnel are not required to put themselves at risk in order to restrain an uncooperative patient. Elicit assistance from law enforcement, mental health and Medical Control as needed.
3. For suicidal adults who are combative or attempting to refuse care, contact law enforcement. Patient will be transported by police or EMS to ED for evaluation.
4. If no life threat is apparent, a patient may be left in the care of a competent adult who assumes responsibility for them. The responsible adult should sign the Refusal of Care/Transport form.
5. Document the patient's neurologic and mental status, as well as specific advice given to the competent adult who is assuming care regarding the possible adverse consequences of refusing care, and alternatives for obtaining care.

Minors

1. Patients under age 18 are minors and cannot legally sign a refusal of care. Law enforcement or a competent adult legal guardian must sign and accept custody of the patient.
2. No one, including parents, can refuse medical care for potentially life-threatening conditions for a minor or an incompetent adult.

USE OF PATIENT RESTRAINTS

Occasionally, a patient exhibits behavior that is dangerous to the patient, the public or to the responders and we may need to use a device to restrain them. A device is considered a restraint if it is placed to prevent movement and done without the consent of the patient.

PROCESS OF RESTRAINT

1. Always try to encourage the patient to self-control their behavior BEFORE deciding to apply the restraints.
2. Offer to place “soft safety bracelets” or otherwise ask patient to allow you to voluntarily place restraints to prevent the patient from hurting him or herself or others.
3. **Be ready and able to overpower patient.** Never attempt physical restraint without the resources needed to safely overpower a patient. (**One responder per limb and head**)
4. Have a plan of action and assign roles. Act quickly. One provider should communicate with the patient continuously. Use only the force necessary for restraint.
5. Ideally, have police present during restraint but do not delay necessary action or risk the safety of EMS personnel by delaying restraint.
6. Use commercially available soft restraints or improvise soft restraint such as a towel and one-inch tape.



7. Handcuff and cable ties should only be applied and removed by law enforcement personnel.

TRANSPORTING WITH RESTRAINTS

1. Place patient in a supine position with legs secured to a backboard or stretcher and one arm secured high above the head and the other low at the patient's side and both secured to the backboard or stretcher. Additional restraint may be placed across the lower part of the chest, the hips, and upper thighs.
2. Monitor the patient's airway and vital signs very closely once restrained given the patient is unable to protect his or her airway.
3. Once restraints have been applied, they should not be taken off until the patient is at the ER.
4. A non-rebreather mask may be placed to protect EMS personnel from spit.

DOCUMENTATION

It is important to document the behavior that made restraints necessary as well as the restraint technique used. The documentation must reflect continual concern for the patient's safety and well-being as well as descriptions of the patient's ongoing mental status and behavior.

CRIME/ACCIDENT SCENE PROTECTION

1. Approaching the scene
 - a. Safety – Do not proceed unless law enforcement has secured the scene.
 - b. Route - All emergency personnel should use the same route in and out of the crime scene.
 - c. Limit the number of EMS personnel on the scene to what is needed.
2. Evidence protection
 - a. EMS personnel should exercise extreme caution in approaching scenes suspected or known to involve any violent act and preserve physical evidence that may be used to develop investigative leads and to prosecute defendants in court.
 - b. Avoid rearranging materials at the scene, stepping on evidence, smearing fingerprints or adding your own fingerprints. Check with law enforcement before cleaning vehicle debris from the road.
 - c. If clothing must be cut, do not cut through bullet holes or knife cuts.
 - d. In a hanging or other crime involving ropes, avoid cutting a rope at the knot. If the rope is over a limb or a beam, do not pull it down.
 - e. Inform the officer in charge about any material (coat, sheet, blanket, etc.) used to cover/protect the victim from the elements.
 - f. Designate a spot for trash and avoid dropping items on the scene.
 - g. If you need to move a body to provide aid, mark its location beforehand.
 - h. If patient is deceased or dies during your resuscitation, do not remove SGA or any other invasive equipment. Mark all sites that caregivers broke the victim's skin (epi-pen, glucose checks, etc.).
3. Parking/positioning vehicles
 - a. Check with incident command to determine where EMS staging area should be positioned. Notify dispatch of arrival and location.
 - b. Request fire apparatus to protect/block medic units from oncoming traffic. Park medic unit to provide maximum protection to patients and EMS personnel.
 - c. Avoid accident debris and tire skid marks as you approach.

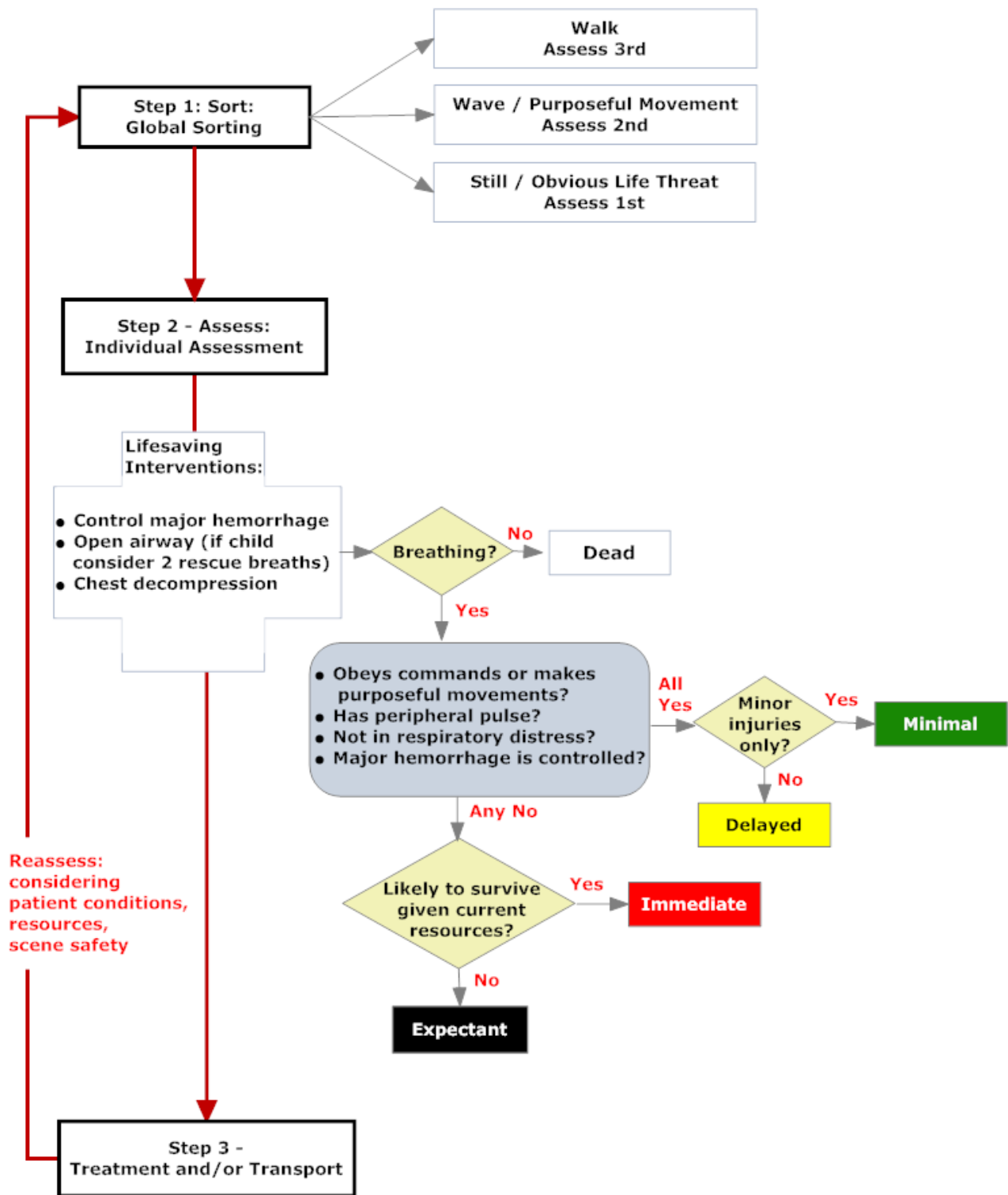
MCI FIELD TRIAGE

All MCI patients shall be initially triaged using the SALT (sort, assess, life-saving interventions, treatment and/or transport) system. Patient severity is identified using the following categories:

Immediate	(Red)	Critically injured patients / life threatening
Delayed	(Yellow)	Seriously injured patients / can delay up to one hour
Minimal	(Green)	Walking wounded patients / can delay up to three hours
Deceased	(Black)	Deceased and/or mortally injured patients / no care initiated
Expectant	(Grey)	Injuries likely to be incompatible with life given available resources

Refer to the Whatcom County Operations Manual for more detailed information on SALT.

- **Step 1 (Sort)** – The initial responder enters the triage area, identifies himself or herself and directs all those who can walk to gather and remain in a safe place. Most of these patients will eventually be tagged Green once triaged. Patients that remain should be asked to follow a command (wave) to be observed for purposeful movement. The patients that do not move and ones with obvious life-threatening conditions are the first ones to assess.
- **Step 2 (Assess)** – Individual assessment should begin with limited rapid lifesaving interventions
 - Control major hemorrhage with tourniquets or direct pressure provided by other patients or devices
 - Open airway through position or basic adjuncts (no advanced airways). If patient is a child, consider 2 rescue breaths.



ABDOMINAL COMPLAINTS

Specific ALS Indicators

1. Positive postural changes.
2. Severe unremitting pain unrelieved by position

BLS Care

1. Prepare to suction patient if vomiting, estimate volume and describe color and consistency of vomit.
2. Monitor vital signs every 5-15 minutes.

ALTERED LEVEL OF CONSCIOUSNESS (LOC)

ALS Indicators

First or atypical seizure

Symptoms are persistent and not resolving

BLS Care

1. Consider oxygen
2. If seizure is suspected, protect patient from injury, remove objects from mouth and upper airway, do not restrain patient during seizure, and remove hazardous objects near patient.
3. If patient is not alert, position in the recovery position.
4. Perform blood glucometry.
5. Consider Naloxone MAD 2-4 mg.
6. Consider other possible causes for patient's altered level of consciousness:

A lcohol	T rauma/ Tumor
E pilepsy	I nfection
I nsulin	P sychosis
O verdose	S troke
U nderdose/ Uremia	

ALS Care

1. Consider Naloxone: 0.4 - 4.0 mg IV/IO, IM, or MAD. Titrate to effect.

ANAPHYLAXIS

Additional ALS Indicators

Wheezing, difficulty swallowing, hoarse or changed voice.
Hives (urticaria) away from the area of contact.

BLS Care

1. Consider oxygen.
2. Remove stinger as needed.
3. Give Epinephrine if signs of anaphylaxis:
 - a. Optional to help the patient administer their own epi-pen.
 - b. If the patient does not significantly improve within 10 minutes, a second dose can be given with consultation to Medical Control.
 - c. All patients receiving epinephrine should be transported to the ED.
4. Monitor vital signs every 5 minutes
5. BLS transport is appropriate for stable patients with good results from epinephrine injection and if additional epinephrine is available if needed.

Epinephrine

Indication for drug administration: Hypotension, hypoxemia, sustained tachycardia (before epinephrine), labored breathing, wheezing or diminished lung sounds, diffuse hives, inability to speak or swallow, oral swelling and throat tightness.

Contraindications: None in a life-threatening emergency.

Procedure – Intramuscular Injection

Adult Dose: – 0.3 mg of 1:1,000

Pediatrics – 0.15 mg of 1:1,000

- Scrub the skin vigorously with an alcohol wipe
- Break open ampule, or, if using a vial, cleanse vial with alcohol wipe
- Insert the needle into the ampule or vial and withdraw the appropriate volume of medication
- Hold the needle upright. Push any air bubbles and extra medication out of the syringe
- Use the anterolateral thigh or middle deltoid (thigh preferred especially for children). Broadly hold the muscle, stab the needle at a 90° angle to the skin surface, and inject the medication into the muscle.
- Discard the needle in the Sharps Container.
- Cover the puncture site with an adhesive bandage

ALS Care

1. Provide airway and ventilatory support.
2. NS bolus IV/IO. If patient is hypotensive:

- a. Adult: 1-liter NS.
- b. Pediatric: 20 ml/kg, up to 40 ml/kg total.
3. Epinephrine: early in the patient's treatment.
 - i. May repeat IM epinephrine after 10 minutes for continued symptoms.
 - ii. If full cardiovascular collapse, consider Epinephrine 0.3 - 0.5 mg 1:10,000 IV/IO slow push (Pediatric: 0.01 mg/kg). Repeat as needed.
4. Cetirizine 10mg PO if able to swallow.
5. Diphenhydramine 1mg/kg IV/IO, IM or PO.
 - a. Pediatric: 0.5 - 1.0 mg/kg. Max 50 mg.
6. Consider Prednisone 1-2 mg/kg PO if able to swallow, max dose 60 mg in adults and 40 mg in peds.
7. Consider nebulized Epinephrine .05 mg 1:10,000 (5 mL) for upper airway obstruction.
8. Consider Glucagon 1 – 2 mg IV/IO or IM for patients on BETA blockers who are not responding to Epinephrine.
9. Consider Albuterol for patients with wheezing.

ARRHYTHMIA

ALS CARE

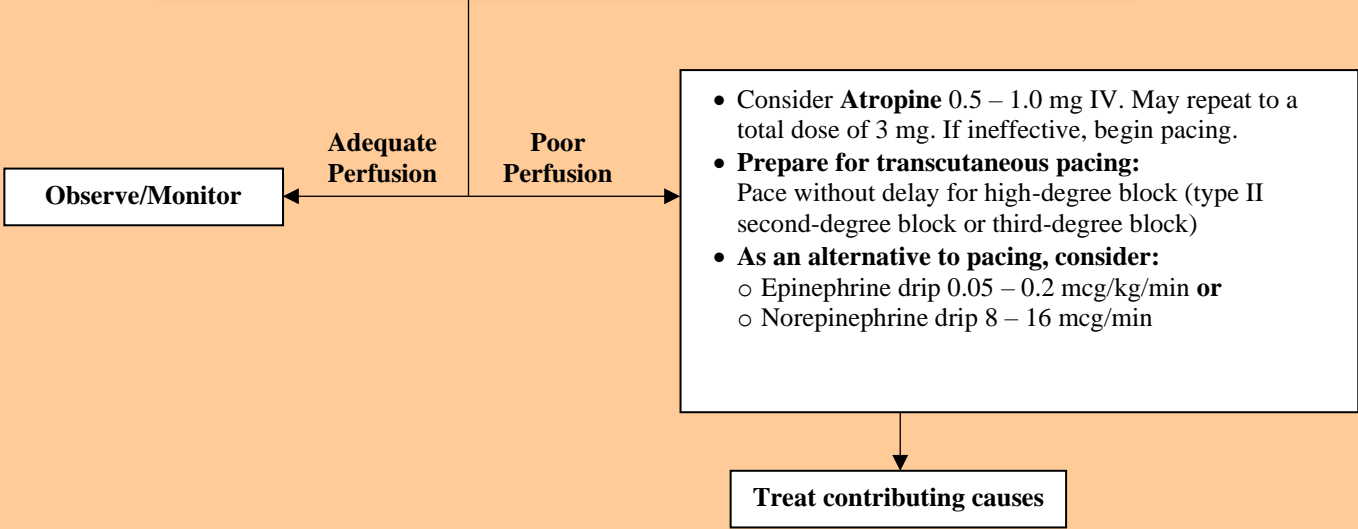
- 1) Tachycardia algorithm
- 2) Bradycardia Algorithm
- 3) Synchronized Cardioversion
 - i) Sedate with Midazolam or Ketamine as needed, avoiding delays in cardioversion if patient is unstable
 - ii) Synchronize machine prior to each shock
 - iii) Start with 100J, increase by 50J for each subsequent shock (max 200J)
- 4) Magnet use with AICD/Pacemakers
 - Placing a magnet over an AICD or pacemaker will produce a different result depending on the device, but typically will cause a pacemaker to pace asynchronously between 70-90 bpm and will inhibit the defibrillation function of an AICD. Asynchronous pacing can lead to higher risk for ventricular tachycardia.
 - Indications for magnet use:
 - i) AICD
 - (1) Inactivation during CPR or after death
 - (2) Inactivation during transcutaneous pacing
 - (3) Inactivation when inappropriately shocking. ***AICD is often shocking appropriately for VF/VT. Be sure to capture EKG and confirm shocks are inappropriate prior to use.
 - ii) Pacemaker
 - (1) Oversensing inappropriate signals, resulting in bradycardic rhythm when pacing should occur.
 - (2) Pacemaker-mediated tachycardia: reentry tachycardia creates inappropriate paced tachycardia
 - Instructions:
 - i) Do not utilize the magnet unless you have pads placed on the patient's chest (adjacent to but not over their implanted device) and ready to pace/defibrillate.
 - ii) Place magnet directly over the device on patient's chest. You may hear beeping lasting up to 60 seconds to confirm detection of the magnet.
 - iii) Programmed function should resume once magnet is removed. Be sure to alert ED staff that a magnet has been used.

BRADYCARDIA ALGORITHM

BRADYCARDIA
With a pulse and signs/symptoms resulting from the Bradycardia

- Maintain patent **airway**; assist **breathing** as needed
- Monitor ECG (identify rhythm), blood pressure, oximetry
- Establish IV access

Signs or symptoms of poor perfusion caused by bradycardia?
(acute altered mental status, ongoing chest pain, hypotension or other signs of shock)



- Reminders**
- If pulseless arrest develops, go to Pulseless Arrest Algorithm
 - Search for and treat possible contributing factors:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypoglycemia
 - Hypothermia
 - Toxins
 - Tamponade, cardiac
 - Tension pneumothorax
 - Thrombosis (coronary or pulmonary)
 - Trauma

TACHYCARDIA ALGORITHM

TACHYCARDIA
With a pulse and signs/symptoms resulting from the Tachycardia

- Assess and support ABCs as needed
- Monitor ECG, blood pressure, oximetry
- Identify and treat reversible causes

Symptoms Persist

Is Patient Unstable?

- Altered mental status
- Ongoing chest pain
- Hypotension
- Other signs of shock
- Wide complex rate > 180 presumed unstable

Perform immediate synchronized cardioversion

- Establish IV access and give sedation if patient is conscious; do not delay cardioversion
- If pulseless arrest develops, see Pulseless Arrest Algorithm

- Stable**
- Establish IV access
 - Obtain 12-Lead ECG
 - **Is QRS narrow (<0.12)**

**Narrow QRS:
Is Rhythm Regular?**

**Wide QRS:
Is Rhythm Regular?**

Regular

Irregular

Regular

Irregular

- Attempt vagal maneuvers
- Adenosine 12mg rapid IV push
- A second dose of 12mg may be given after 1 – 2 minutes if tachydysrhythmia has not stopped

Irregular Narrow-Complex Tachycardia
Probable atrial fibrillation or possible atrial flutter or MAT

- Diltiazem 0.25 mg/kg (max 20mg) slow IV push
- May repeat in 10 to 20 minutes

If V-Tach or uncertain rhythm:

- Amiodarone 150 mg over 15 mins.
- Elective synchronized cardioversion
- If rate is >200, consider immediate cardioversion

- Amiodarone 150 mg over 15 mins
- If Torsades de Pointes, Magnesium Sulfate 2 – 4g
- Elective synchronized cardioversion

Does Rhythm Convert?

Converts

Does Not Convert

- If rhythm converts, probable reentry SVT
- Observe for reoccurrence
 - **Consult Medical Control**
 - Treat reoccurrence with Adenosine or control rate with Diltiazem 0.25 mg/kg (max 20mg) slow IV push

Consult Medical Control
Possible atrial flutter, ectopic atrial tachycardia, or junctional tachycardia:

- Diltiazem 0.25mg/kg (max 20mg) slow IV push

During Evaluation

- Secure verify airway & vascular access when possible
- Prepare for cardioversion

Treat contributing factors:

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

BEHAVIORAL

Additional ALS Indicators

Abnormal behavior with abnormal vitals

Abnormal behavior with serious co-morbidity (e.g., drug or alcohol OD)

Need for chemical restraint (preferred over physical restraint)

BLS Care

1. Secure safety of personnel and patient, using physical restraints if necessary, to prevent injury to patient or others. Call ALS or Medical Control if using restraints.
2. Call police if necessary (if patient refuses transport but EMTs feel patient needs further evaluation or for responder safety). If law enforcement is reluctant to get involved, have them speak with Medical Control.
3. Monitor for mental status and physiological changes. Do not leave patient unobserved.

Transporting Handcuffed Patients

Law enforcement may ask BLS units to transport a patient whom they have handcuffed or otherwise physically restrained. If there is no alternative restraint and if the patient requires medical attention, an officer should accompany the patient in the ambulance for transport. If not possible, the officer should follow directly behind the ambulance.

ALS Care

1. For chemical restraint, consider:
 - a. Ketamine 1-2 mg/kg IV/IO, 2-4 mg/kg IM or 1-2mg/kg MAD.
 - b. Midazolam 1.5 - 5 mg IV/IO or IM, or 0.3 mg/kg (max 5mg) MAD.
 - c. If immediate safety is not a concern, start with a low dose and escalate as needed.
2. Consider medical causes for the behavioral disturbance:

A lcohol	T rauma/ Tumor
E pilepsy	I nfection
I nsulin	P sychosis
O verdose	S troke
U remia	

BURNS / SMOKE EXPOSURE

Additional ALS Indicators

Singed facial hair, soot in mouth/nose or gravelly/distorted voice

Burns with associated injury, i.e., significant trauma, electrical shock, or arrhythmia

Lower threshold if age less than 6 or over 60

BLS Care

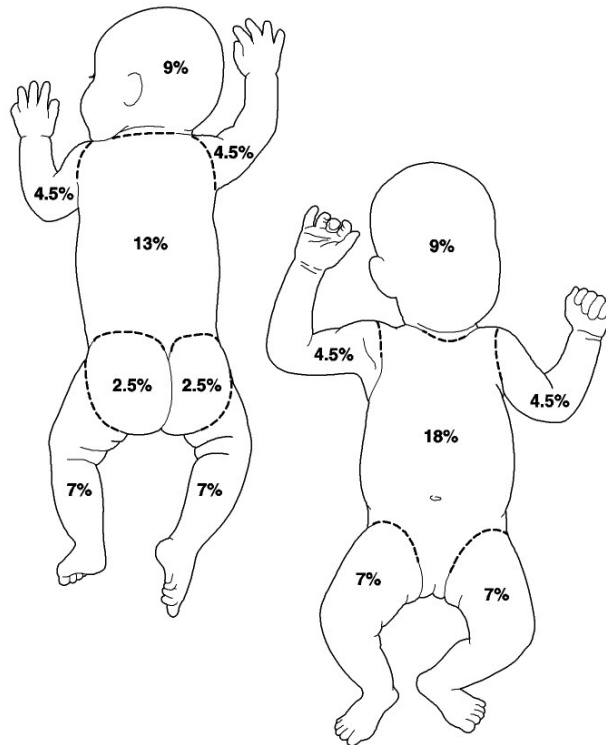
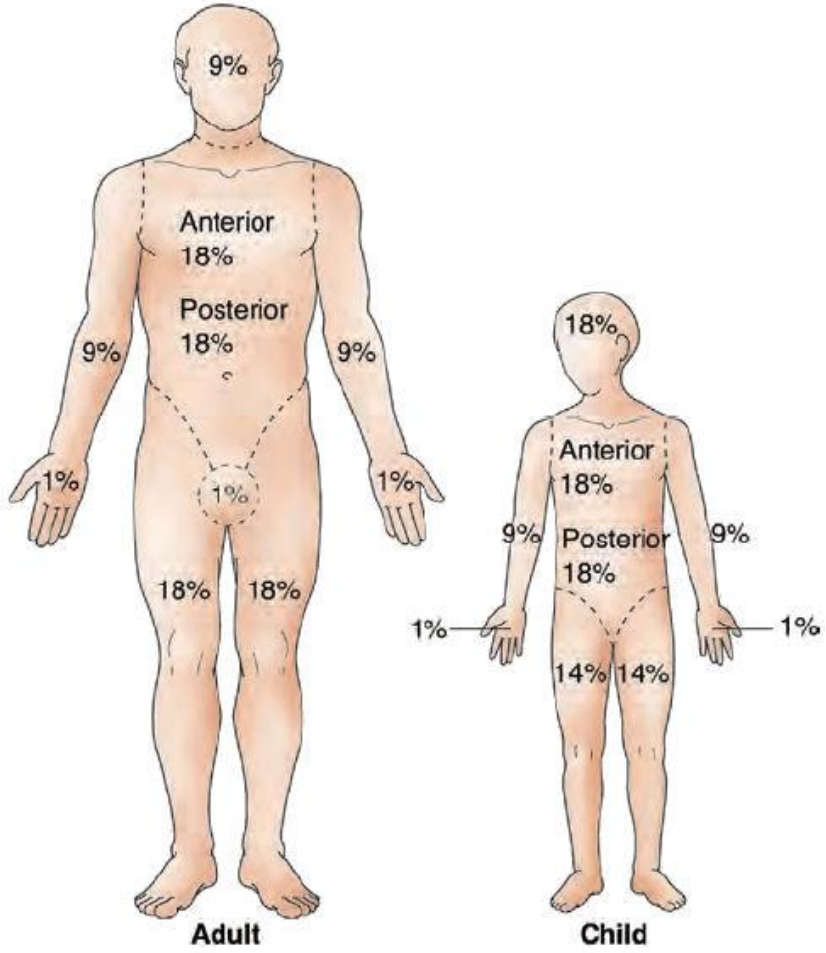
1. Remove any constrictive clothing or jewelry.
 - a. Place all clothing in Patient Belonging Bag or other plastic container and label with patient's name. Transfer to hospital or law enforcement.
2. If hazardous materials are involved, advise dispatch, incident command and medical control.
 - a. Brush away dry substances or chemical agents.
 - b. Flush wet chemicals with water.
3. Estimate the size and depth of the burn.
 - a. Superficial Burn – Cool, moist pads
 - b. Partial thickness Burn – Cover with dry dressing or sheets
4. Avoid hypothermia.
5. Assess patient for other trauma.
6. If smoke inhalation, apply O2 wide-open by NRB given carbon monoxide can cause pulse oximetry to give falsely elevated values.
7. Eye burns
 - a. Flush chemical burns to the eyes for 15 minutes with normal saline or water.
 - b. Ultraviolet burns to the eyes: treat with cool compresses over closed eyes.

BURN CONSIDERATIONS	
DEPTH	SUPERFICIAL PARTIAL THICKNESS FULL THICKNESS
EXTENT	% BODY SURFACE AREA (USE THE RULES OF NINES)
CAUSE	THERMAL ELECTRICAL CHEMICAL LIGHT RADIATION
LOCATION	CRITICAL LOCATIONS: FACE AND UPPER AIRWAY HANDS AND FEET GENITALS OR GROIN REGION BURNS THAT ENCIRCLE BODY PARTS

ALS Care

1. Observe face and oropharynx for burns/singed hairs/soot/edema and consider intubation if needed. Decreased ET tube size may be needed.
2. Measure CO levels via CO monitor if suspected and administer high flow O₂ or CPAP.
3. Consider Cyanide poisoning in a patient with altered level of consciousness, especially in the presence of an elevated CO level, and administer Hydroxocobalamin (Cyanokit) per medication protocol.
4. If partial thickness burn > 10% TBSA, establish IV/IO and start slow NS drip at 500cc/hr.
5. Provide analgesia with Hydromorphone, Fentanyl, Ketamine and/or Nitrous Oxide as needed.
6. Consider Midazolam for anxiety control.
7. Eye burns:
 - a. Instill Proparacaine 1-2 ophthalmic drops into affected eye one time as needed for pain. Contraindicated if suspicion for punctured/ruptured globe.

Rule of Nines



CHEST DISCOMFORT

Additional ALS Indicators

Anginal equivalents, including syncope, discomfort into the jaw, back or arm if patient is at least 35 years old or has a history of heart problems

Use of nitroglycerin

BLS Care

1. Administer oxygen to maintain SpO₂ of 92-95%.
2. Administer 324 mg aspirin if the following conditions are met:
 - a. Has not taken at least 162mg in the last 24 hours.
 - b. No recent bloody stools or bleeding at other non-compressible site.
 - c. Do not suspect aortic dissection (i.e., sudden, stabbing, radiating to the back, associated with left arm symptoms/hypotension, history of aortic problems)
3. Assist patient with nitroglycerin prescribed to that patient, if the following conditions are met:
 - a. Pain is similar to that normally experienced as angina or cardiac pain
 - b. Blood pressure greater than 100 mmHg systolic
 - c. Patient takes no more than three doses total (5 minutes apart)
 - d. Prescription expiration date should not have passed
 - e. The patient should not have taken erectile dysfunction medications within 48 hours (i.e, Viagra (Sildenafil), Cialis (tadalafil) or Levitra (vardenafil)).
4. Monitor vital signs every 5 minutes.

ALS Care

Treatment

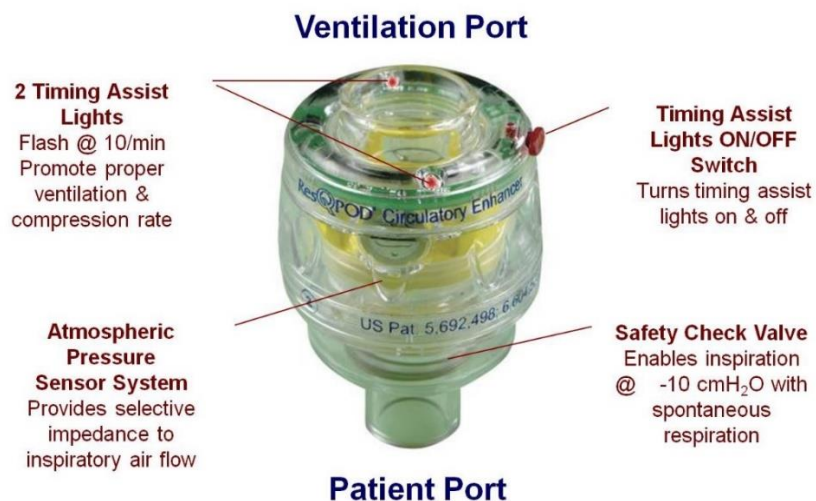
1. NS IV/IO or saline lock.
 - a. Bilateral IV/IO placement in unstable patients and STEMI candidates. Right-side hand or wrist and left-side AC preferred.
 - b. Consider Fluid challenge for patients who are hypotensive or suspected of inferior wall acute myocardial infarction.
2. Administer Nitroglycerin (NTG) 0.4 mg SL if SBP>100 and no evidence of inferior STEMI. Repeat every 5 minutes if pain persists up to total of 3 doses.
3. Hydromorphone 0.5 - 1 mg IV/IO or Fentanyl 1-2 mcg/kg IV/IO to alleviate pain.
4. Consider low dose Midazolam 1 – 2 mg IV/IO as needed for anxiety.
5. If STEMI is identified, provide 80 mg of Atorvastatin, early notification to ED Charge Nurse, and Code Red transport.

Cardiac Arrest

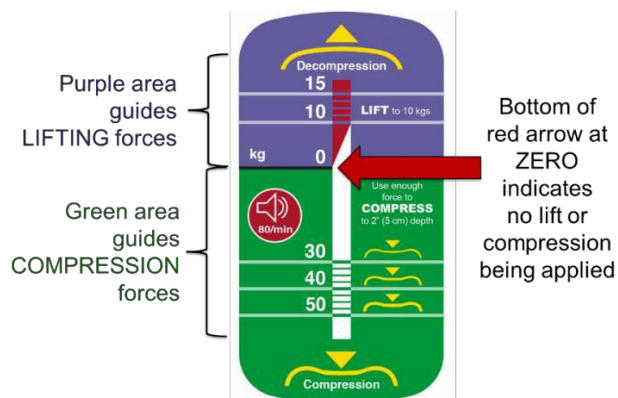
Whatcom County emergency personnel will be certified in the CPR and AED standards for BLS providers, per the American Heart Association, American Red Cross or other nationally recognized organization with substantially equivalent guidelines and approved by the Department of Health. Adult CPR may be administered with the **impedance threshold device (ITD)** and the **active compression decompression device (AC/DC)**.

- Prioritize high-quality CPR with timely defibrillation if indicated. Minimize interruptions of CPR.
- The LUCAS mechanical CPR device should be applied if CPR quality becomes compromised due to fatigue or personnel resource limitation, or for transport.
- AED:
 - AED pad placement should not overlap with ResQ Pump placement or LUCAS thumper.
 - Once the pads are in place and the machine is ready, CPR may be stopped at any time in the cycle to push the analyze button.
 - If a shock is indicated, perform 30 compressions while the AED is charging before delivering the shock
- Pediatric Considerations:
 - Pediatric pads should be used for defibrillation in patients less than 20 kg (45lbs), however adult pads can be used if pediatric pads are unavailable. The adult pads can be used in either the traditional anterior (white to right, red to ribs) placement or in an anterior/posterior placement.
 - The ITD may be used for infant and child patients in cardiac arrest who weigh more than 10kg.
- Ventilations with a bag-valve mask
 - Following each set of 30 compressions, squeeze the bag two times (30:2 compression to ventilation ratio). One ventilation for an adult should deliver approximately 500ml of air over 1 second, with visible chest rise. Care should be taken not to over ventilate.
 - Ensure good mask seal by choosing an appropriate size mask for the patient, using two-handed technique whenever possible, and pulling the jaw up to the mask rather than pushing the mask onto the face.
 - Consider placing an airway adjunct, such as an oropharyngeal (OPA) airway.
- If a pulse is detected but the systolic blood pressure is < 60 mm/Hg and the patient remains unconscious and/or shows evidence of inadequate perfusion, continue CPR.

Impedance Threshold Device (ResQ POD)



AC/DC



Considerations:

- Call for additional manpower early
- Rotate compressors often (at least 2 min)
- Suction cup will migrate, monitor location
- Monitor quality of compressions/decompressions. If quality cannot be maintained, go back to hands on (no pump) compressions

ResQCPR Contraindications:

Traumatic cardiac arrest.

Children

Evidence of recent sternotomy (within the past 6 months)

RESQCPR WITH AN ADVANCED AIRWAY (SGA OR ET TUBE)

Once the airway is secured with a SGA or ET tube, move the ResQ POD to the tube, turn on the timing assist lights, and continue chest compressions without interruption for ventilations. Ventilations should be performed 10 breaths/min (one breath every 6 seconds) for adults.

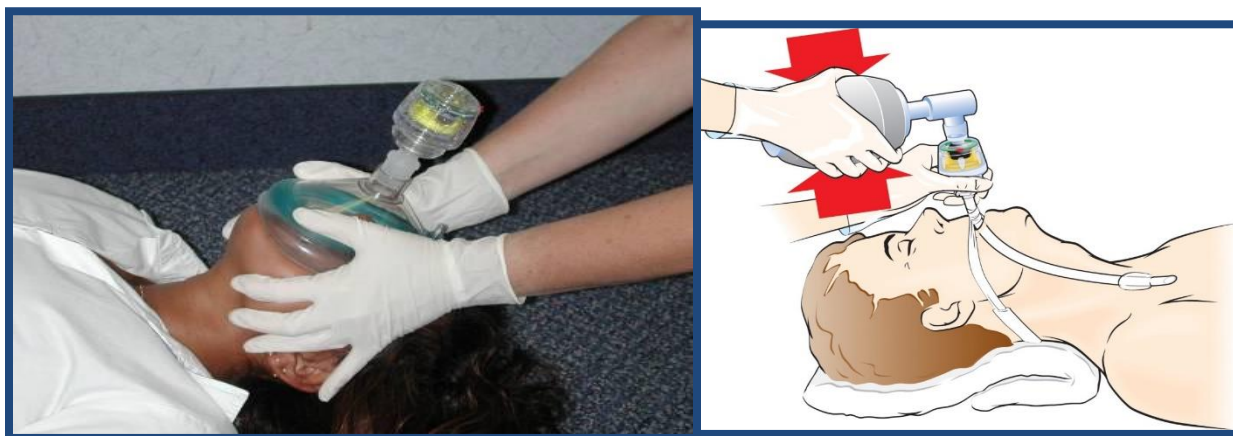


Photo credit: ACSI

2015 AHA CPR Guideline Recommendations with Whatcom County Modifications

Component	Adult	Child/Infant
Recognition	Unresponsive with abnormal breathing and no pulse palpated over 10 seconds No obvious death or DNR orders (older adults)	
Compression Rate	100-120/min. 80/min. with AC/DC	100-120/min.
Compression Depth	At least 2 inches	At least 1/3 AP diameter (about 1.5-2 inches)
Chest Wall Recoil	Allow complete chest wall recoil between compressions. If using the AC/DC device, allow recoil until the force guide reads -10 kgs.	Allow complete chest wall recoil between compressions.
Open the Airway	Head tilt-chin lift (in suspected trauma: jaw thrust)	
Compression to Ventilation Ratio (until placement of advanced airway)	30:2	30:2 – Single Rescuer 15:2 2 BLS Rescuers
Ventilations with Advanced Airway (BLS Only)	1 breath every 6 sec. (may use timing lights on ITD; 10/min) during continuous chest compressions. Care should be taken not to over ventilate; about 1 second per breath with visible chest rise.	
Defibrillation	Attach and use AED as soon as available. Minimize interruptions in chest compressions before and after shock, including delivery of 30 compressions during the charge up period between 'Shock Advised' and energy delivery. Hover over the chest during shock and resume CPR immediately.	
ROSC (Return of Spontaneous Circulation)	Perform pulse check during every AED analysis after the initial 2 minutes of CPR. Patients with ROSC should be transported with Mechanical Compression Device plate under the patient (at a minimum), in the event of re-arrest. Remove the ITD if ROSC achieved.	

ALS CARE – CARDIAC ARREST

During Resuscitation

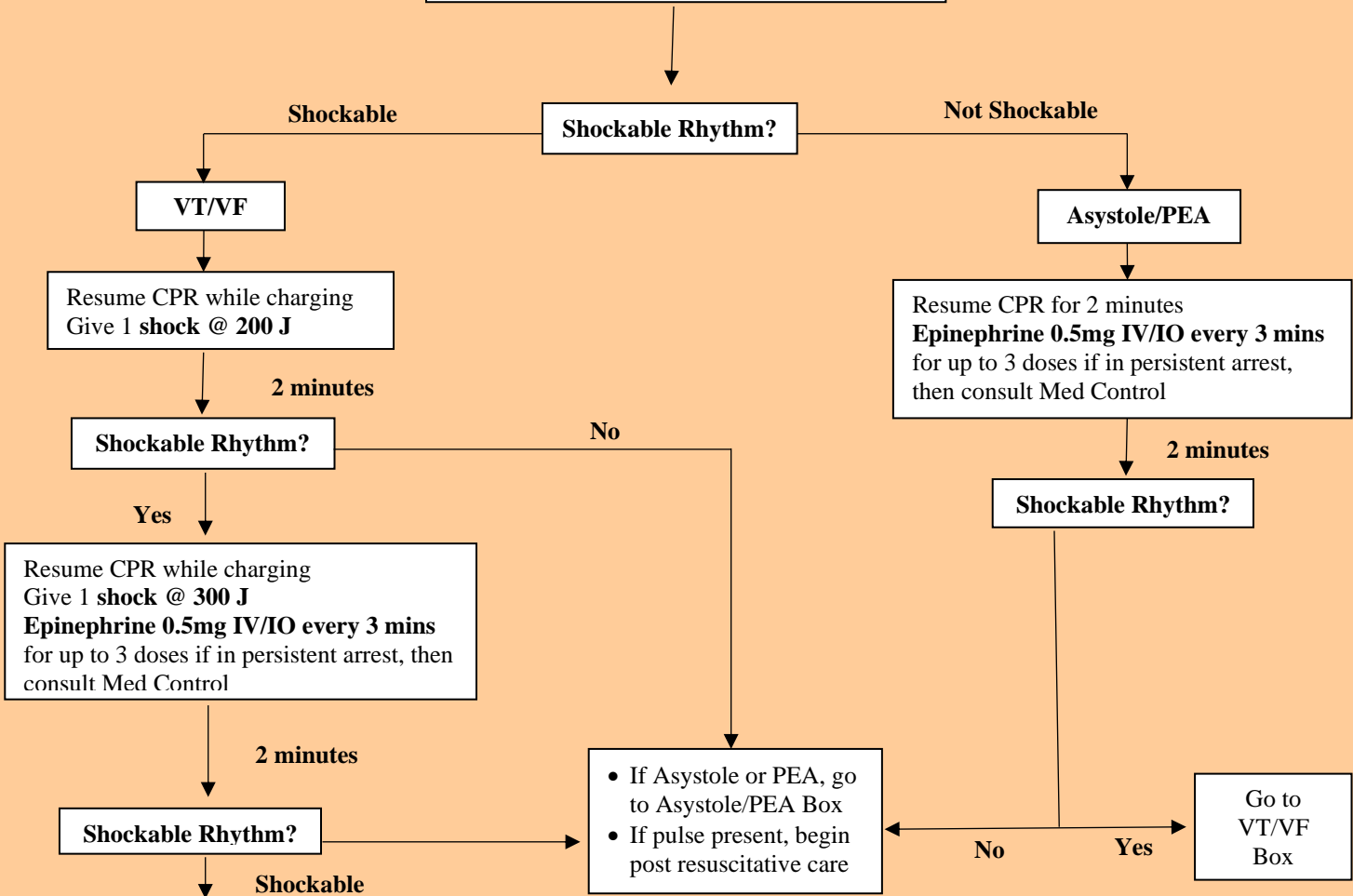
1. Defibrillation may be attempted immediately if arrest is witnessed by EMS or if high-quality CPR is being performed on EMS arrival. Otherwise, one to two minutes of chest compressions should be performed prior to defibrillation.
2. All cardiac arrest medications should be given IV or IO, however ET administration may be considered if IV/IO attempts are unsuccessful.
3. Start transport to the ED with ongoing CPR for possible ECMO/cath lab if the below criteria are met. Alert the ED as early as possible enroute.
 - a. Patient is in persistent VT/VF or PEA with clear signs of life (i.e., mental status, movement, gasping, EtCO₂) after 3 rounds of high-quality CPR, shocks if indicated, and cardiac medications.
 - b. Transfer time from scene to ED \leq 30 min
 - c. No significant comorbidities (i.e., dialysis-dependent, dementia, significant stroke)

Post-Resuscitation and Termination

1. Complete 12-lead ECG.
2. Resuscitation may be terminated in the field if any of the following criteria are met:
 - a. The electrical rhythm is asystole or pulseless electrical activity and has not responded to the treatment protocol for Asystole or PEA.
 - i. Asystole/PEA must be confirmed in two leads.
 - ii. No respiratory effort is present
 - b. The patient is in a non-perfusing rhythm for 30 minutes or more, and ETCO₂ is 10 mm/hg or less.
 - c. No respiratory effort is present.
 - d. Hypothermia prior to arrest is not present.
 - e. DNR is presented after resuscitation is initiated.

PULSELESS ARREST ALGORITHM

PULSELESS ARREST
Give 2 minutes of CPR before rhythm check.



Resume CPR while charging
Give 1 **shock @ 360 J**

Antidysrhythmics:

- **Amiodarone:** 300mg initial dose, then consider additional 150mg bolus
- Consider Magnesium 2-4g for torsades de pointes

- *During CPR**
- Push hard and fast (100/min)
 - Perform 30:2 compression:breath cycles until advanced airway secured, then perform continuous compressions with breath every 6 sec
 - Ensure full chest recoil
 - Minimize interruptions in chest compressions <10 seconds
 - Avoid hyperventilation
 - Check rhythm every 2 minutes
 - Rotate compressors every 2 minutes with rhythm checks prior to mechanical CPR
 - Search for and treat possible contributing factors:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypothermia
 - Toxins
 - Tamponade, cardiac
 - Tension pneumothorax
 - Thrombosis (coronary or pulmonary)
 - Trauma

PEDIATRIC PULSELESS ARREST ALGORITHM

PEDIATRIC PULSELESS ARREST

- **Unwitnessed** arrest: Give 2 minutes of CPR and ventilations prior to rhythm check
- **Witnessed** arrest: go to box below, begin CPR until monitor is attached

Check Rhythm
Shockable Rhythm?

Shockable

Not Shockable

VT/VF

Asystole/PEA

Continue CPR while defib is charging
Give 1 shock

- Manual biphasic @ 2 J/kg

Resume CPR Immediately
Secure Airway

Resume CPR immediately for 2 minutes
Secure Airway

- **Epinephrine 0.01mg/kg IV/IO**
- Repeat every 3-5 min up to 3 doses, then discuss with Med Control

Give 2 minutes of CPR*

Give 2 minutes of CPR*

Check Rhythm
Shockable Rhythm?

No

Shockable

Continue CPR while defibrillator is charging
Give 1 shock

- Manual biphasic 4 J/kg
- **Epinephrine 0.01mg/kg IV/IO**
- Repeat every 3-5 mins up to 3 doses, then discuss with Med Control

• If Asystole or PEA, go to Asystole/PEA Box

• If pulse present, begin post resuscitative care

Give 2 minutes of CPR*

No

Yes

Go to VT/VF Box

Check Rhythm
Shockable Rhythm?

Shockable

Continue CPR while defibrillator is charging
Give 1 shock

- Manual biphasic 4 J/kg

Resume CPR immediately after shock

Consider Antidysrhythmics:

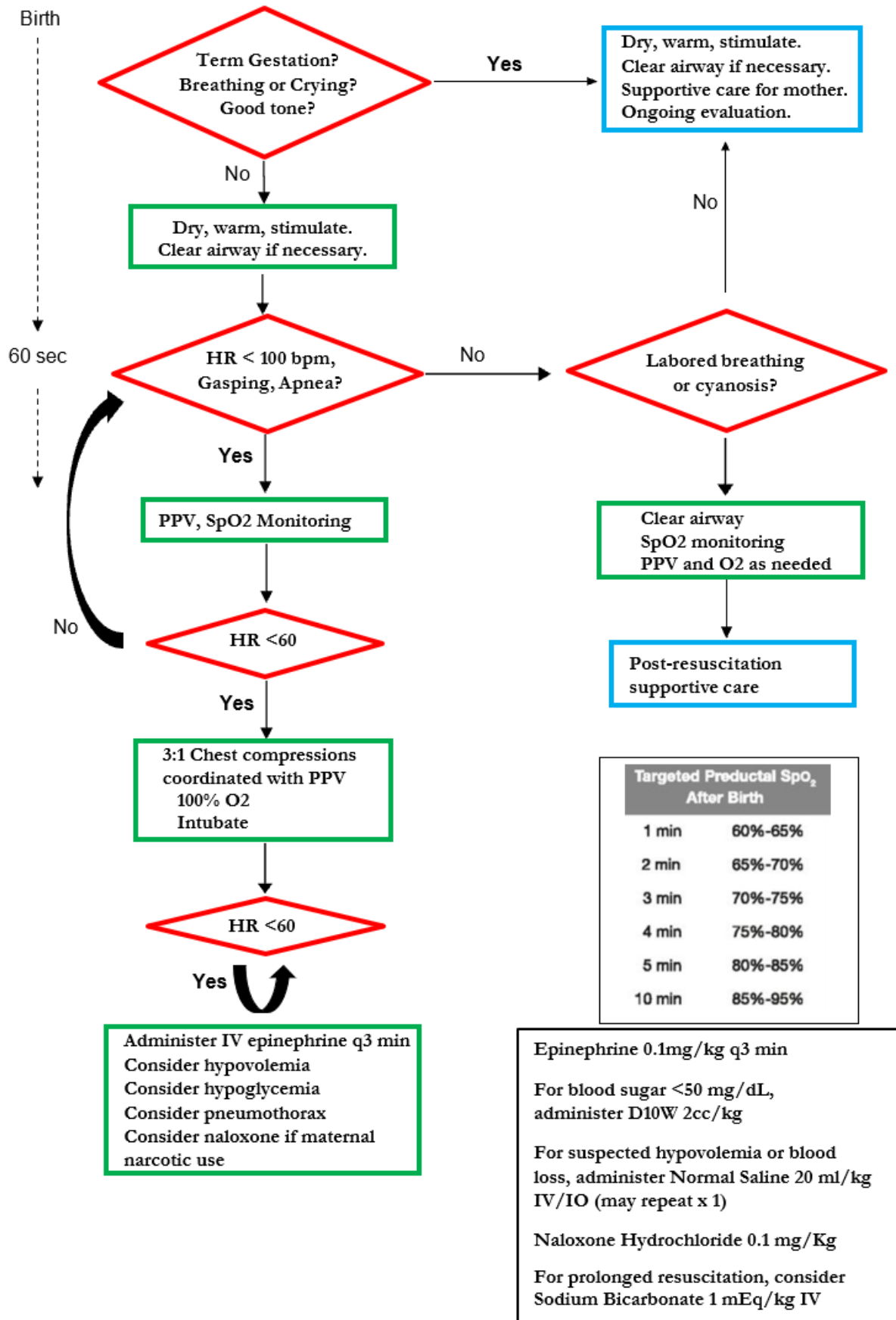
- **Amiodarone:** 5mg/kg IV/IO, can repeat once for persistent VF/VT
- Consider **Magnesium** 25 -50mg/kg for **torsades de pointes**

After 2 minutes of CPR, re-check rhythm
Minimize interruptions to chest compressions

***During CPR**

- Push hard and fast (100/min)
- Perform 30:2 compression:breath cycles until advanced airway secured, then perform continuous compressions with breath every 6 sec
- Ensure full chest recoil
- Minimize interruptions in chest compressions <10 seconds
- Avoid hyperventilation
- Check rhythm every 2 minutes
- Rotate compressors every 2 minutes with rhythm checks
- Search for and treat possible contributing factors:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypothermia
 - Toxins
 - Tamponade, cardiac
 - Tension pneumothorax
 - Thrombosis (coronary or pulmonary)
 - Trauma

Neonatal Resuscitation



COLD-RELATED CONDITIONS

Additional ALS Indicators

- Temperature less than 95° F (35°C) oral or tympanic with evidence of exposure
- Cessation of shivers in a cold patient
- Significant co-morbidities (e.g., elderly, illness, trauma, alcohol, or drugs)

BLS Care (Hypothermia)

1. Remove patient from wet clothing and the cold environment. Warm the patient with heated blankets and hot packs and the ambulance.
2. Provide supplemental oxygen and/or ventilatory assistance as necessary. SpO₂ readings may be difficult to obtain and/or unreliable.
3. Monitor patient's vital signs and rectal temperature ideally. Use ECG monitor if authorized.
4. Patients can have extreme bradycardia. Do not initiate CPR if pulse or breathing is present. If patient is in extremely rural/wilderness environment and no pulse is detectable, do not initiate CPR given the risk of inducing ventricular fibrillation.
5. Be gentle moving patients given the risk of inducing ventricular fibrillation.

BLS Care (Frostbite)

1. Splint and/or bandage the cold-injured part to protect from further injury and do not let the patient walk on or use it.
2. Remove constricting jewelry (e.g., rings, watchbands).
3. Do not rub or massage injured tissue.
4. Do not rewarm frozen tissue unless transport time will exceed two hours, it is certain that the thawed tissue will not refreeze, and you have consulted medical control. Rewarming should be done with 100°F - 104°F (37.8 – 40° C) water. Do not use dry heat; it heats unevenly and may burn frozen tissue. Stop rewarming when the tissue turns red-purple and becomes pliable.
5. Transport to an emergency room.

ALS Care (Hypothermia)

1. For rectal temperature <90° F (32° C), also administer warm IV fluids.
2. For hypothermic cardiac arrest:
 - a. If ventricular fibrillation, may defibrillate up to 3x at standard joules (200J, 300J, 360J)
 - b. If rectal temperature <88° F (31° C), withhold cardiac medications

CONGESTIVE HEART FAILURE / CARIOGENIC SHOCK

BLS Care

- 1) Position patient upright unless hypotensive, then lie supine.
- 2) Monitor vital signs every 5 to 10 minutes depending on patient's condition.
- 3) Consider CPAP per protocol. Request respiratory therapist from ED charge nurse if using CPAP.

ALS Care

1. IV/IO TKO or saline lock.
2. Cardiac monitor: rhythm strip and 12-lead ECG.
3. Consider the following medications:
 - a. NTG 0.4 mg SL (if BP > 90 systolic). Repeat every 3-5 minutes as needed for SOB.
 - b. Midazolam 1 to 2mg IV for anxiety. Repeat in 10 minutes if needed.
4. Advanced airway support as indicated.
5. For hypotension/cardiogenic shock:
 - a. Assess for pericardial tamponade and consider pericardiocentesis.
 - b. Assess for tension pneumothorax and consider needle thoracostomy.
 - c. Assess for hypovolemia and consider 250cc IV NS bolus.
 - d. Norepinephrine drip at 8 mcg/minute (titrate up to 16 mcg/min to maintain SBP > 90 or MAP > 65) or consider Epinephrine 1:100,000 (push-dose) 10-20mcg.

ECD (TASER) DART REMOVAL AND CARE

Electronic Control Devices (ECD, e.g.: TASER®, stun gun) may be used by Law Enforcement to subdue a patient. The ECD fires two darts attached by wires and delivers up to 50,000 volts of electricity for up to 5 seconds. This is generally not harmful to pacemakers or cardiac function unless electrical discharge lasts more than 15 seconds.

BLS Care

1. Assure the scene and crew safety. Police must remain in custody of patient.
2. Do not remove darts if:
 - Patient is not under control
 - Dart should be removed at hospital if in the eye.
3. Remove ECD cartridge from gun or cut wires *before removing darts*
 - Grasp dart firmly with one hand and pull to remove. Treat dart as contaminated needle and dispose of in sharps container or ECD cartridge.
4. Bandage wounds as appropriate.

ELECTROCUTION

BLS Care

1. If downed electrical lines are present, stay clear of the scene until lines are deenergized or controlled by electric utility authority.
2. Examine patient for entrance and exit wounds.
3. Assess patient for other trauma.
4. Continuous cardiac monitoring.

ALS Care

5. Obtain EKG.
6. Treat pain as needed with Fentanyl 25-50 mcg IV bolus, Hydromorphone 0.5-1 mg IV bolus, or Nitrous Oxide inhalation.

DROWNING

Additional ALS Indicators

Any underwater rescue
SCUBA diving related incidents

BLS Care

Remove the victim from the water. **Do not become a victim.**

Neutral in-line cervical stabilization during removal from water with a backboard if spine injury is suspected or patient is unresponsive.

If there is no suspected spinal injury, consider recovery position.

Prepare suction, expect vomiting.

All immersion incidents should be transported to the hospital for further evaluation.

Care for Scuba Diving Accidents

Position patient supine or on side if airway compromise.

Full neurological and orientation exam for baseline.

Call Divers Alert Network (1-800-446-2671) if unsure of symptoms or for further treatment guidance (www.diversalertnetwork.org).

DYSTONIC REACTION

Dystonic reactions are jerking or spastic involuntary movements, often in the face or neck, in response to use of dopaminergic medications such as prochlorperazine or haloperidol. They are often painful and uncomfortable, and treatment is focused on calming and reassuring the patient.

ALS Care

1. Diphenhydramine: 1 mg/kg IV/IO or deep IM (Adult and pediatric). Max 50 mg.

EPISTAXIS (NOSEBLEED)

BLS Care

1. Have the patient sit down and lean forward
2. Blow nose on affected side to clear clots.
3. Pinch and hold nostrils closed for 10 minutes
4. Discourage patient from swallowing blood
5. If the patient loses consciousness, place in recovery position

ALS Care

1. May spray Oxymetolazone into each nostril after blowing nose in the procedure above. Repeat after 10 minutes as needed.

GLUCOMETRY

Indications for Use:

1. Altered LOC.
2. Suspected blood glucose-related problem.
3. Signs and symptoms of stroke.
4. Suspected drug or alcohol intoxication.
5. Seizure.

ALS Care (Hypoglycemia)

1. NS IV/IO, unless patient is able to self-administer glucose by mouth.
2. Blood glucose <60 mg/dL in adults or <50mg/dL in children, with an altered level of consciousness:
Give D10W 1ml/kg (0.1 g/kg) IV/IO. Repeat as needed to increase the blood glucose level to between 80 – 150 mg/dL.
3. If unable to start an IV/IO in an unconscious patient, administer Glucagon 1 mg IM in adults or 0.03 mg/kg IM in children.
4. Once patient is adequately responsive, ensure oral intake of complex carbohydrates.

HEAT-RELATED EMERGENCIES

BLS Care

1. Cool patient:
 - i) Remove from the hot environment and place in a cool environment (air conditioner running on high).
 - ii) Loosen or remove clothing.
 - iii) Apply cool packs to cheeks, soles, palms, neck, groin and/or armpits
 - iv) Keep skin wet by applying cool water with sponge or towels.
 - v) Fan aggressively.
2. Have patient drink water or other fluid replacement if patient is responsive and not nauseated.
3. Monitor patient's vital signs and temperature (ideally rectal).
4. Avoid shivering if possible.

ALS Care

1. NS or LR IV/IO fluid challenge (20 ml/kg, max 40 ml/kg).
2. Use cardiac monitoring – patient may experience dysrhythmias.
3. If temperature is $> 38^{\circ}\text{C}$ (100.4°F), Acetaminophen 1,000 mg PO (Peds: 15- 20 mg/kg PO; Rectal: 20 mg/kg) unless known to have taken within preceding 4 hours.

Transport

1. Decreased level of consciousness, unstable vital signs, or postural changes.
2. Age extremes.
3. Complex medical conditions or significant comorbidities.

HYPERKALEMIA

Signs of hyperkalemia may include:

1. Peaked T waves, loss of P waves, and widened QRS on EKG
2. Arrhythmias
3. Cardiac arrest

Suspect in patients with:

1. Kidney disease and dialysis dependence
2. Rhabdomyolysis.
3. Burns and crush injuries 72 hours post event
4. Addison's disease.

ALS Care

1. IV/IO access.
2. Continuous cardiac monitoring
3. Albuterol continuously via nebulizer.
4. Calcium Chloride 1 gm IV/IO over 5 minutes. Flush IV/IO line thoroughly.
5. Sodium Bicarbonate 50 mEq IV/IO bolus, followed by 50 mEq in 100cc D5W over 10 minutes.
 - DO NOT infuse calcium and bicarbonate in the same line as it will cause precipitation.

HYPERTENSIVE EMERGENCY

A patient has 'hypertensive urgency' when their SBP > 180 mmHg or DBP > 110 mmHg, however this becomes an 'emergency' when they have signs and symptoms of end-organ damage due to the severe hypertension. These may include shortness of breath, chest pain, EKG changes indicating ischemia or strain, altered mental status, seizure, and visual deficits.

ALS Care

1. NS IV/IO or saline lock.
2. Treat signs and symptoms supportively per protocol.
3. Nitroglycerin: 0.4 mg SL or spray, repeat as needed every 3 - 5 minutes until improvement in signs and symptoms.

HYP0/HYPERGLYCEMIA

Additional ALS Indicators

Failure to respond to oral glucose

Suspected diabetic ketoacidosis

Blood glucose < 60 and unable to safely eat or drink

Blood glucose > 300 with decreased LOC or abnormal vital signs

BLS Care

Perform blood glucometry for criteria below after the ABCs and initial assessment have been completed.

If blood glucose <60, position upright and give oral glucose, honey, juice, or other food high in simple sugar.

If unable to swallow, position on side, ventilate as necessary, and await paramedics.

Monitor vital signs and recheck glucose

Transport

Hypoglycemic patients who have responded to oral glucose administration may be left on scene if the following are met:

1. The patient does not take oral diabetic medications or long-acting insulin (Lantus).
2. The patient is alert and oriented with appropriate behavior.
3. Blood glucose level must be 80 mg/dL or greater.
4. There must be a responsible individual on scene with the patient or appropriate care plan.
5. Patients must have oral intake of food before leaving the scene.
6. Patients are instructed to promptly see their physician for follow-up.

OBSTETRIC

Additional ALS Indicators

Imminent birth

Hypertension in pregnancy (systolic > 140 mmHg) after 20 weeks gestational age

Excessive vaginal bleeding

Any abdominal trauma to mother after 20 weeks of pregnancy

Dispatch to birthing center/midwife

IMMINENT DELIVERY

BLS Care

1. Prepare delivery area.
2. Position mother in semi-reclining position.
3. Deliver oxygen by nasal cannula at 10-15L/min until delivery unless you have a way to measure fetal HR (such as with accompanying midwife) and it remains 120-180 bpm.
4. If membrane has ruptured and mother feels urge to push, prepare OB equipment and don sterile gloves, gowns, and eye protection
5. Allow the mother to push and as baby crowns, support head on the front and the back as it rotates.
6. If cord is around the baby's neck, gently slip it over the head. If the cord is too tight to slip over the head, apply umbilical cord clamps and cut between them.
7. Be prepared for body to deliver quickly after the head and to catch the baby with a towel.

ALS Care

1. If arm or leg presentation, breech presentation, shoulder dystocia, prolapsed cord, significant hemorrhage, decreased fetal heart rate or other significant complication:
 - a. Contact Medical Control immediately
 - b. Place O2 wide open by NRB
 - c. Placing patient on her left side or in knee to chest position (McRoberts position), as appropriate.
 - d. If prolapsed cord, place sterile gloved index and middle fingers into vagina and push fetal head up to relieve pressure on cord
 - e. Transport code red to L&D with early notification

POST DELIVERY INSTRUCTIONS

BLS Care

Baby:

1. Dry and stimulate the baby. Wrap in a warm blanket and prevent hypothermia.
2. Place two clamps on the cord two inches apart and six inches away from the baby. Cut the cord between the clamps. Inspect the cord for bleeding.
3. Document the time of birth, and APGAR score at 1, 5 and 10 minutes.
4. Allow mother to hold baby if both patients are stable. Monitor vital signs every 5-15 minutes.

APGAR SCORING				
Score at 1 and 5 minutes after birth.				
Clinical Sign		0 points	1 point	2 points
A	Appearance	Blue, pale	Body pink, extremities blue	Completely pink
P	Pulse	Absent	Less than 100 /minute	More than 100/minute
G	Grimace	No response	Grimaces to stimulation	Cries
A	Activity	Limp	Some flexion of extremities	Active motion
R	Respiratory Effort	Absent	Slow, irregular	Strong cry or respirations

Maternal:

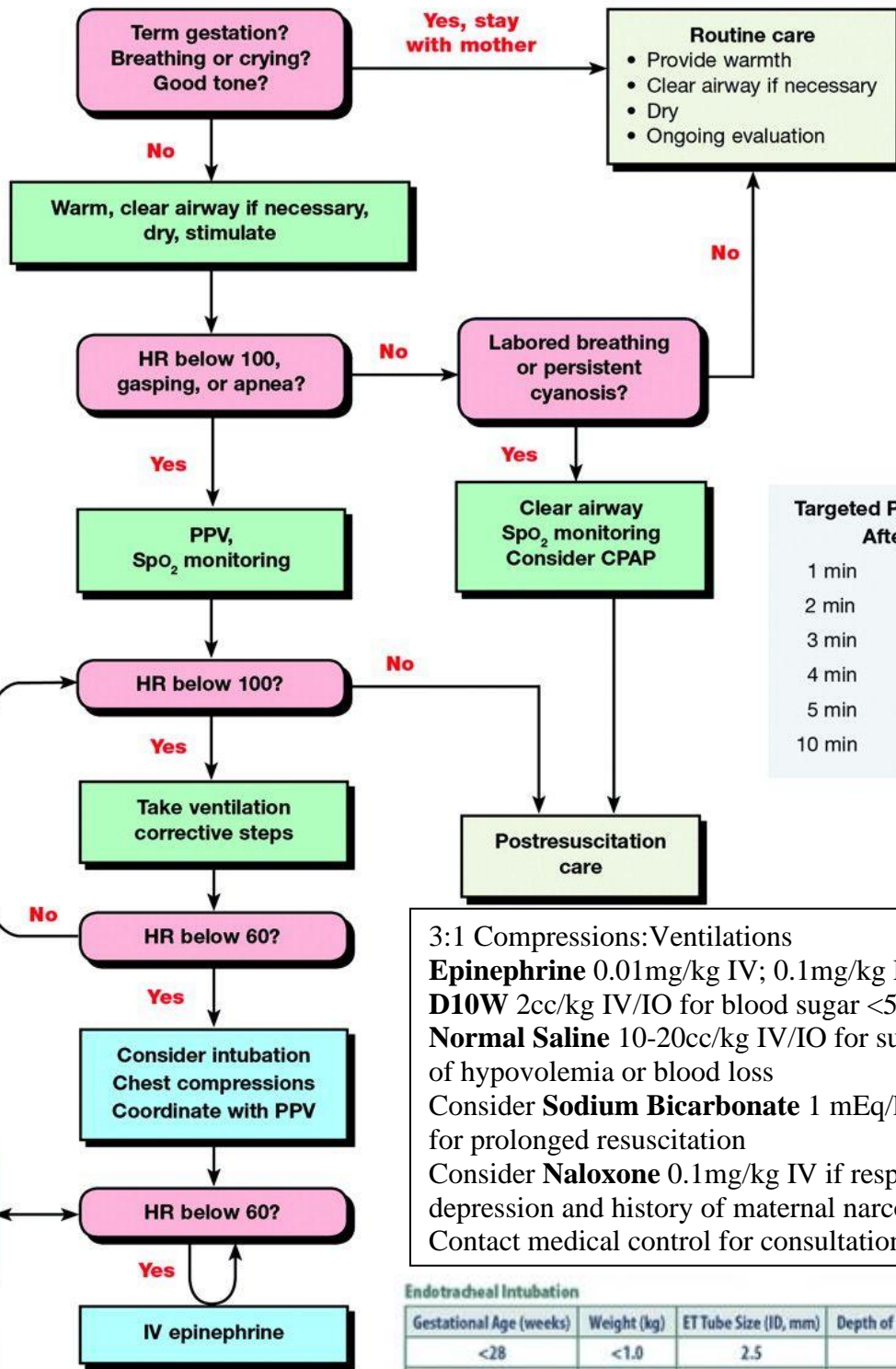
1. Observe mother's perineum for excessive bleeding and apply pressure if bleeding seems to come from skin tearing. A small to moderate amount of bleeding from the vagina is normal.
2. Massage the uterus through the lower abdomen to stimulate uterine contraction.
3. The placenta should be delivered spontaneously within 20 minutes. Do not pull on the umbilical cord. Once delivered, wrap the placenta in the bag supplied in the OB Kit and send with the mother to the hospital.
4. Monitor vital signs every 5-15 minutes.
5. BLS transport of mother and baby to hospital is appropriate if no ALS indicators

Newborn Resuscitation

Birth

30 sec

60 sec



Targeted Preductal SpO₂ After Birth

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

3:1 Compressions: Ventilations
Epinephrine 0.01mg/kg IV; 0.1mg/kg ET
D10W 2cc/kg IV/IO for blood sugar <50 mg/dL
Normal Saline 10-20cc/kg IV/IO for suspicion of hypovolemia or blood loss
 Consider **Sodium Bicarbonate** 1 mEq/kg IV/IO for prolonged resuscitation
 Consider **Naloxone** 0.1mg/kg IV if respiratory depression and history of maternal narcotic use
 Contact medical control for consultation

Endotracheal Intubation

Gestational Age (weeks)	Weight (kg)	ET Tube Size (ID, mm)	Depth of Insertion* (cm from upper lip)
<28	<1.0	2.5	6-7
28-34	1.0-2.0	3.0	7-8
34-38	2.0-3.0	3.5	8-9
>38	>3.0	3.5-4.0	9-10

*Depth of Insertion (cm) = 6 + weight (in kg)

Take ventilation corrective steps
Intubate if no chest rise!
 Consider:
 • Hypovolemia
 • Pneumothorax

PRE-ECLAMPSIA / ECLAMPSIA

Pre-eclampsia may be present in a pregnant woman without history of hypertension who is over 20 weeks gestation and has persistent SBP > 140mmHg or DBP > 90 mmHg.
Seizures in a woman over 20 weeks gestation should be presumed to be due to eclampsia.

ALS Care

Pre-Eclampsia

1. IV/IO.

Eclampsia

1. NS IV/IO.
2. O2 by NRB at 10-15 L/min
3. Magnesium Sulfate 6g IV/IO over 15-20 min or 5g IM into each buttock (total 10g) in patient that is actively seizing or has recently seized.
4. Consider Midazolam 4mg IV, IO, or IM if seizures are not controlled by Magnesium Sulfate.

OVERDOSE/POISONING

Aspirin 51
Carbon Monoxide 52
Cyanide 53
Hydrogen Fluoride 54
Ingested 55
Opioids 56
Tricyclic Antidepressants 57
Pediatric 58

ASPIRIN OVERDOSE

Description

Toxic Adult Dose: > 150mg/kg

Chronic OD: 100mg/kg for 2 or more consecutive days.

Symptoms

Mild: Nausea/vomiting, tinnitus, dizziness, tachypnea.

Severe: Fever, hypoglycemia, confusion/hallucinations, pulmonary edema, seizure, coma

BLS CARE

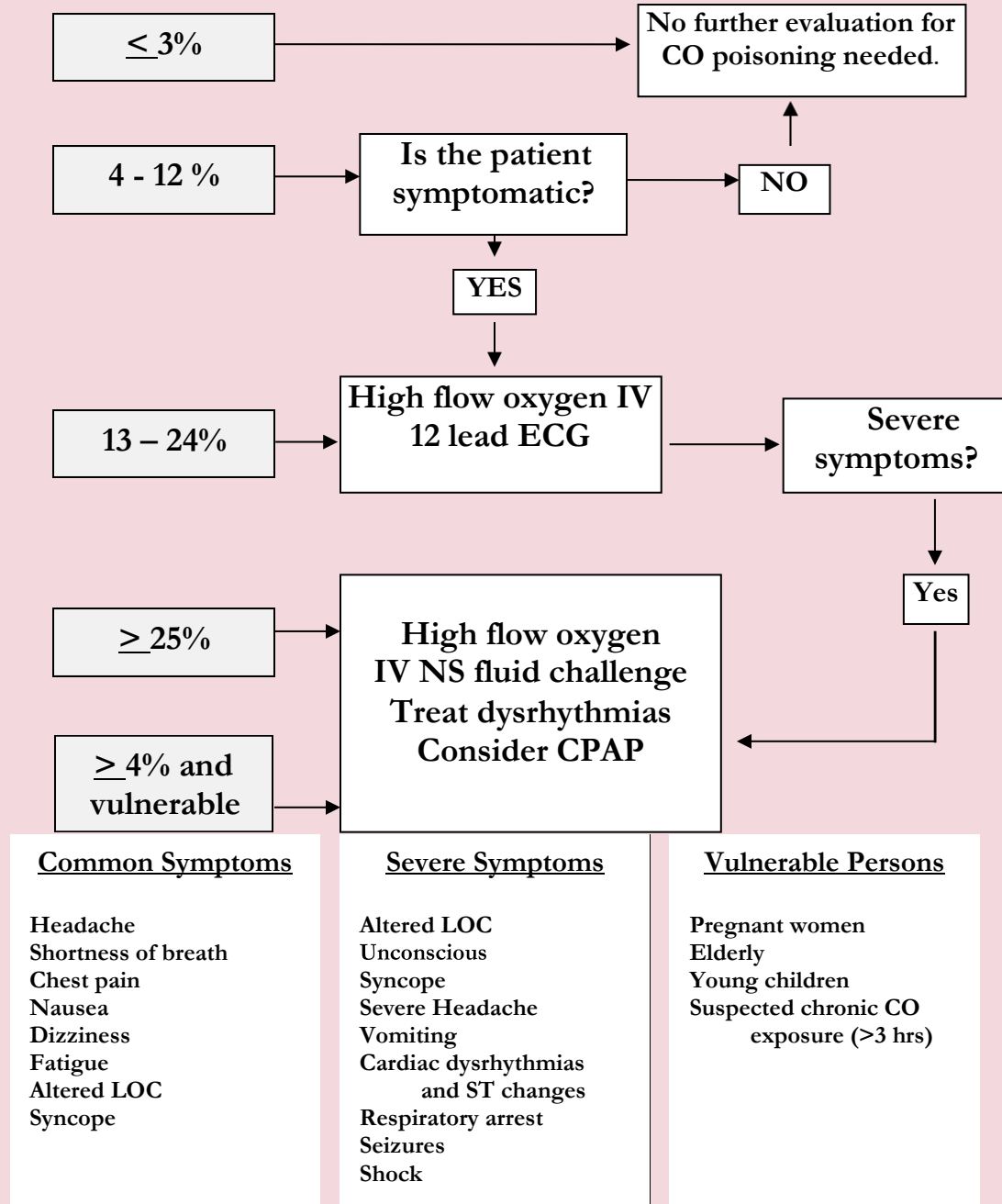
1. ABCs and supportive care as indicated in General patient care protocols
2. If needed, ventilate at patient's inherent tachypneic respiratory rate to compensate for respiratory/metabolic acidosis.

ALS CARE

1. Provide airway and ventilatory support only if patient seems to be tiring, shows signs of respiratory failure or is unable to maintain their own airway.
2. NS IV/IO, fluid bolus (20cc/kg) rapid infusion.
3. If hypotension, cardiac arrest, or requiring ventilation, Sodium Bicarbonate 2 amps (100mEq) IV/IO slow push.

CARBON MONOXIDE EXPOSURE

ALS Care



CYANIDE POISONING

“Cherry-red” skin is not a reliable indicator and if present is a late sign of CO poisoning.

Description

Cyanide poisoning results from inhalation, ingestion, or dermal exposure to cyanide-containing compounds, including smoke from closed-space fires. Cyanide is a byproduct of synthetic material combustion and is also used in a variety of manufacturing and metallurgy processes. Cyanide poisoning prevents cells from utilizing oxygen, which causes a shift to anaerobic metabolism, resulting in lactate production, cellular hypoxia and metabolic acidosis. Treatment is based on early recognition and antidote administration.

Signs and Symptoms:

Headache, confusion, vomiting, dyspnea, tachypnea (early), chest tightness, (early) or hypotension (late), dysrhythmias, seizures, coma and cardiovascular collapse.

Suspect cyanide poisoning in smoke-inhalation victims presenting with:

1. Exposure to fire or smoke in an enclosed area.
2. Presence of soot around the mouth, nose or oropharynx.
3. Altered mental status.

BLS CARE

1. High flow oxygen.
2. Airway and ventilatory support as needed.
3. Personal protective equipment and decontamination measures as needed. Use ambulance exhaust vent fan during transport.

ALS CARE

1. At least 2 large-bore IV/IO lines
2. NS fluid bolus (20cc/kg).
3. Cyanokit (Hydroxocobalamin):
 - a. Refer to Cyanokit protocol for dosage and administration.
 - b. Mixing instructions, age-based dosages and drip rates are found on the package.
 - c. Administer in separate IV line from other drugs due to incompatibility.

HYDROGEN FLUORIDE

Description

Hydrogen fluoride, used in industrial processes such as glass etching, aluminum refining, and rodenticides, has a sharp and irritating odor.

Health Hazard

****CAUTION****: HF is highly toxic for rescuers. Extreme caution must be taken.

Signs and symptoms

1. Irritation of eyes, eyelids, nose and skin.
2. Coughing, choking due to pulmonitis and pulmonary edema.
3. If ingested: salivation, nausea, vomiting, diarrhea, abdominal pain.
4. Painful burns.
5. Cardiovascular collapse is possible.

BLS CARE

1. Use PPE and consider SCBA. Remove patient from contaminated area.
2. Irrigate contaminated skin with water for at least 15 minutes.
3. For eye burns, irrigate with running water or NS continuously.

ALS CARE

4. Apply calcium gel to skin burns. For hand burns, consider placing calcium gel inside a glove.
5. NS IV/IO fluid bolus (20cc/kg) as needed for hypotension.
6. If ingested, give oral calcium such as milk or calcium carbonate (Tums). Discuss administration of Calcium Chloride 500 mg-1g IV/IO with Med Control physician.
7. CPAP as needed for respiratory distress, if there was no HF ingestion.

INGESTED POISONS

BLS CARE

1. ABCs and supportive care as indicated in General patient care protocols
2. Bring any containers, bottles, etc. to ED
3. For respiratory depression or coma of unknown etiology, consider Naloxone 2 mg MAD.
4. Considering calling Poison Control – 1(800) 222-1222.
5. Activated charcoal
 - a) Administer only if:
 - toxicant ingestion is < 1 hour
 - patient has a normal LOC
 - no contraindications are present (see medication protocol).
 - Recommended by Medical Control or Poison Control.
 - b) Adult dose 50–100 g PO (Pediatric: 15–30 g). May be diluted with water or another drink to make it more palatable.

ALS CARE

1. Cardiac monitor. Treat dysrhythmias per protocols.
2. Normal Saline IV/IO or saline lock.

OPIOID INDUCED RESPIRATORY COMPROMISE

Additional ALS Indicators

Continued decreased LOC or respiratory compromise after naloxone
Patient refusal of care (decision to be made by ALS only)

BLS Care

Consider Naloxone (see below)
BLS transports are appropriate for stable patients with good results from naloxone administration and additional Naloxone is available to give if needed.

Medications: Naloxone (Narcan®)

Indications: Adult hypopnea (**RR < 6**) or apnea secondary to suspected opioid overdose

Contraindications: none

Dosage and Administration

1. Attach nasal atomizer to syringe with 2 mg (2 ml) of naloxone
2. Place atomizer within the nostril and briskly administer 1 ml on each side.
3. Continue ventilating patient as needed
4. If no arousal occurs after 5-10 minutes, proceed down Altered LOC protocol.
5. There is no maximum dose for naloxone.
6. Patients may experience withdrawal symptoms and become agitated or violent.

ALS Care

1. Monitor EtCO₂ to evaluate for respiratory depression and titrate naloxone.
2. Administer Naloxone 0.4-4.0 mg IV/IO, IM, or MAD. Titrate to respiratory rate of 6 – 8

TRICYCLIC ANTIDEPRESSANTS

Description

Tricyclic antidepressant drugs include but are not limited to:

- Amitriptyline- Elavil
- Desipramine - Norpramine, Pertogran
- Doxepin - Adapin, Sinequan
- Imipramine - Tofranil, Presamine

TCAs bind to cholinergic receptors and block neurotransmitter reuptake into neurons. Additionally, TCAs can cause sodium blockade in conducting tissues. Patients can deteriorate quickly.

BLS CARE

1. ABCs and supportive care as indicated in General patient care protocols
2. If needed, ventilate at patient's inherent tachypneic respiratory rate to compensate for respiratory/metabolic acidosis.
3. Obtain history of ingested poison. Bring any containers, bottles, etc. to ED.

ALS CARE

1. Consider early RSI and mild hyperventilation. Match patient's inherent respiratory rate and maintain ETCO_2 at 32-35 mmHg to raise pH.
2. Normal Saline IV/IO. Consider 20 cc/kg bolus.
3. Cardiac monitoring and 12-Lead ECG.
4. If patient has a widened QRS complex, ventricular dysrhythmia, decreased level of consciousness or seizure:
 - a. Sodium Bicarbonate 2 amps (100 mEq) IV/IO slow push (Pediatric: 1- 2 mEq/kg). Repeat as needed.
 - b. If Sodium Bicarbonate is ineffective, administer Magnesium Sulfate 2 - 4 g IV/IO.

PEDIATRIC

Additional ALS Indicators

Signs/symptoms of meningitis: stiff neck, petechial rash

General information

1. Minimum normal systolic blood pressure approximately $80 + 2 \times \text{age in years}$.
2. Weight estimate $8 + 2 \times \text{age in years} = \text{weight in kg}$.
 - a. Premature infant weight:
 - i. Below 28 weeks = <1kg
 - ii. 28-34 weeks = 1-2 kg
 - iii. 34-38 weeks = 2-3 kg
 - iv. Above 38 weeks = term birth = > 3 kg
3. Respiratory rates:
 - a. Infant 30-60/minute.
 - b. Toddler 20-40/minute.
 - c. Older child 18-30/minute.
4. Pulse rate:
 - a. Infant 85-205/minute.
 - b. Toddler 100-190/minute.
 - c. Older child 60-140/minute.

BLS Care

1. Fever (temperature above 100.3F / 38C):
 - a. Acetaminophen 15 mg/kg orally or rectal suppository 20 mg/kg if patient has not received Acetaminophen within 6 hours and caregiver is amenable.
 - b. Remove clothes and apply cool towels to reduce temperature.
2. Refer to Handtevy system as needed.

ALS Care

1. Fluid bolus for hypotension, dehydration, or significant tachycardia:
 - a. NS IV/IO 20 ml/kg. May be repeated once if needed.
 - b. Contraindicated in dialysis-dependence or heart failure/congenital heart defects with suspected pulmonary edema
2. Endotracheal tube sizing: $(\text{AGE} + 16)/4$
3. Arrhythmia with signs of shock and cardiac arrest – see algorithms below

PEDIATRIC BRADYCARDIA
With pulses and poor perfusion

- Maintain patent airway, assist breathing as needed
- Give oxygen
- Continuous monitoring

Bradycardia still causing cardio-respiratory compromise?
(eg poor perfusion, hypotension, respiratory difficulty)

Observe/Monitor
Support ABCs
Transport

No

Yes

Perform CPR if heart rate remains <60 bpm with
poor perfusion

Yes

Persistent symptomatic Bradycardia?

No

Epinephrine

- IV/IO: 0.01mg/kg (1:10,000 = 0.1ml/kg; max dose 0.5 mg)
- Repeat every 3 – 5 minutes as needed

Atropine

- 0.02mg/kg (min dose 0.1mg, max dose 0.5mg)
- May repeat once

Reminders

Search for and treat for possible contributing factors:

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

PEDIATRIC TACHYCARDIA
With pulses and poor perfusion

- Maintain patent airway, assist breathing as needed
- Give oxygen
- Monitor ECG, blood pressure, oximetry

Narrow QRS
(≤ 0.09 sec)

Wide QRS
(> 0.09 sec)

Evaluate rhythm with
12-lead ECG/Monitor

Evaluate QRS duration

Possible Ventricular
Tachycardia

- Probable Sinus Tachycardia**
- Compatible history consistent with known cause
 - P Wave present/normal
 - Variable R-R; constant PR
 - Infants: rate usually < 220 /min
 - Children: rate usually < 180 /min

- Probable Supraventricular Tachycardia**
- Compatible history (vague, nonspecific); history of abrupt rate changes
 - P waves absent/abnormal
 - HR not variable
 - Infants: rate usually ≥ 220 /min
 - Children: rate usually ≥ 180 /min

- Possible Ventricular Tachycardia**
- Synchronized Cardioversion: 1 J/kg; if not effective, increase to 2 J/kg. Sedate if possible, but don't delay cardioversion
 - May attempt Adenosine if it does not delay electrical cardioversion. 0.1 – 0.2 mg/kg (max dose 12mg)

Search for and treat
cause

- Consider Vagal Maneuvers:**
- Put bag of ice water over infant's face and eyes (without obstructing airway)
 - Ask child to blow through an obstructed straw

- If IV access readily available: Give **Adenosine** 0.1 to 0.2 mg/kg (max dose 12mg) by rapid IV/IO bolus. If ineffective, may repeat
- Synchronized Cardioversion: 0.5 to 1 J/kg; if not effective, increase to 2 J/kg. Sedate if possible, but don't delay cardioversion

- **If tachydysrhythmia remains refractory:**
- Consult medical control
 - Consider **Amiodarone** 5mg/kg IV over 15 minutes

<p>During Evaluation</p> <ul style="list-style-type: none"> - Secure, verify airway and vascular access when possible - Prepare for cardioversion - Consider consult with medical control 	<p>Search for and treat for possible contributing factors:</p> <ul style="list-style-type: none"> - Hypovolemia - Hypoxia - Hydrogen Ion (acidosis) - Hypo/hyperkalemia - Hypoglycemia - Hypothermia - Toxins - Tamponade, cardiac - Tension pneumothorax - Thrombosis (coronary or pulmonary) - Trauma
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PEDIATRIC PULSELESS ARREST ALGORITHM

PEDIATRIC PULSELESS ARREST

- **Unwitnessed** arrest: Give 2 minutes of CPR prior to rhythm check
- **Witnessed** arrest: go to box below, begin CPR until monitor is attached

Check Rhythm
Shockable Rhythm?

Shockable

Not Shockable

VT/VF

Asystole/PEA

Continue CPR while defib is charging
Give 1 shock

- Manual biphasic @ 2 J/kg

Resume CPR Immediately
Secure Airway

Resume CPR immediately for 2 minutes
Secure Airway

- **Epinephrine 0.01mg/kg IV/IO**
- Repeat every 3 mins up to 3 doses, then discuss with Med Control

Give 2 minutes of CPR*

Give 2 minutes of CPR*

Check Rhythm
Shockable Rhythm?

No

Shockable

Continue CPR while defibrillator is charging
Give 1 shock

- Manual biphasic 4 J/kg
- **Epinephrine 0.01mg/kg IV/IO**
- Repeat every 3 mins up to 3 doses, then discuss with Med Control

Check Rhythm
Shockable Rhythm?

Give 2 minutes of CPR*

No

Yes

Go to VT/VF Box

• If Asystole or PEA, go to Asystole/PEA Box
• If pulse present, begin post resuscitative care

Check Rhythm
Shockable Rhythm?

Shockable

Continue CPR while defibrillator is charging
Give 1 shock

- Manual biphasic 4 J/kg

Resume CPR immediately after shock

Consider Antidysrhythmics:

- **Amiodarone:** 5mg/kg IV/IO, followed by up to 2 repeat doses of 5mg/kg. Interchanged with Epi
- Consider **Magnesium** 25 – 50mg/kg – drug of choice for **torsades de pointes**

After 2 minutes of CPR, re-check rhythm
Minimize interruptions to chest compressions

***During CPR**

- Push hard and fast (100/min)
- Ensure full chest recoil
- Minimize interruptions in chest compressions <10 seconds
- One cycle of CPR: 15 compressions then 2 breaths: 5 cycles ~ 1 – 2 minutes
- Avoid hyperventilation
- Secure airway and confirm placement
- After an advanced airway is placed rescuers no longer deliver “cycles” of CPR. Give continuous chest compressions without pauses for breaths. Give 8 – 10 breath/min.
- Check rhythm every 2 minutes
- Rotate compressors every 2 minutes with rhythm checks
- Search for and treat possible contributing factors:
 - Hypovolemia
 - Hypoxia
 - Hydrogen Ion (acidosis)
 - Hypo/hyperkalemia
 - Hypothermia
 - Toxins
 - Tamponade, cardiac
 - Tension pneumothorax
 - Thrombosis (coronary or pulmonary)
 - Trauma

PEDIATRIC RESPIRATORY DISTRESS – CROUP, RSV, AND EPIGLOTTITIS

Epiglottitis may be signified by drooling, stridor, and leaning forward. Croup typically presents with a barking cough and stridor may be present. Asthma is uncommon under age 2 and respiratory distress is often caused by RSV infection, which may cause wheezing along with congestion and cough.

BLS Care

1. Check SpO₂ and pulse.
2. If the child exhibits respiratory distress, intercostal retractions, nasal flaring or rapid respirations:
 - a. High flow oxygen blow-by, mask or nasal cannula.
 - b. Suction nasal congestion using bulb syringe unless stridor present
3. For the child in extremis (manifested by marked respiratory distress or respiratory failure with a decreased LOC):
 - a. Gently assist respirations with positive pressure bag valve mask with 100% oxygen. Also give O₂ by high flow NC under mask.

ALS Care

4. For suspected RSV with nasal congestion, consider deep suction using suction cannister and/or 1-2 drops normal saline (from a flush) into each nostril.
5. If croup or epiglottitis is suspected and the child exhibits respiratory distress with consistent stridor when calm, intercostal retractions, nasal flaring and rapid respirations:
 - a. Albuterol 2.5 mg by nebulizer. Repeat as needed.
 - b. Nebulized Epinephrine 0.5 mg 1:10,000 (5 mL).
 - c. Consider Epinephrine 0.01 mg/kg IM, maximum dose 0.3 mg.
6. For the child in extremis (manifested by marked respiratory distress or signs of respiratory failure with a decreased LOC):
 - a. Albuterol continuous nebulization through the BVM or administer 8 puffs Albuterol MDI attached to the BVM.
7. For full respiratory arrest where bag valve mask ventilation is unsuccessful:
 - a. Attempt intubation with a tube one size smaller than usual for age.
 - b. Needle cricothyrotomy as a last resort. Use commercial device if available.

SEPSIS

Suspect in any patient with suspected infection and at least 2 of the following:

1. Temperature < 36C (96F) or > 38C (100.4^o)
2. Heart rate > 90
3. Respiratory Rate > 20
4. Acutely altered mental status.

ALS Care

1. Two large bore IV/IO lines
2. NS fluid bolus (Adult 2 Liters, Pediatric 20cc/kg) unless history of dialysis dependence or CHF
 - a. Reassess BP and breath sounds after each 500cc increment.
3. Consider Norepinephrine drip or push-dose epinephrine if hypotensive after fluid bolus.
4. Call ED Nurse Team Leader and provide early notification of sepsis alert

SHORTNESS OF BREATH

Additional ALS Indicators

- Ashen color, cyanosis.
- Audible wheezing or crackles (rales).
- Failure to respond to inhaler/nebulizer

BLS Care

1. If in respiratory distress or cyanotic, apply O₂ immediately via non-rebreather
 - a. Obtain SaO₂ and apply/titrate supplemental O₂ via nasal cannula or non-rebreather to achieve SaO₂ 92-95% (if history of COPD, SaO₂ 88-92%)
2. Provide ventilatory assistance with BVM as indicated.
3. If anaphylaxis suspected, administer Epinephrine.
 - a. If asthma/COPD exacerbation suspected and patient has been prescribed Albuterol or Levalbuterol (Xopenex), assist patient with inhaler or nebulizer. Administer Albuterol MDI, ideally with a spacer, 2-8 puffs or nebulize Albuterol 2.5-5mg by nebulizer (Pediatric Albuterol 1.25-2.5mg). Repeat doses or administer continuously as needed.
4. If apparent choking:
 - a. Encourage patient to cough.
 - b. Heimlich maneuver
 - i. If obese or pregnant: chest thrusts.
 - ii. Infants <1 yr: alternate chest thrusts and back blows.
5. Consider CPAP, bag valve mask ventilation and/or intubation as indicated by the patient's condition.

ALS Care

1. Consider pneumothorax, asthma/COPD exacerbation, pulmonary edema, pulmonary embolism, foreign body, pneumonia.
2. Monitor EtCO₂ value and waveform.
3. If suspected CHF exacerbation, see CHF protocol.
4. If asthma or COPD exacerbation is suspected:
 - a. Prednisone 1-2 mg/kg (max dose 60mg in adults, 40mg in pediatric patients).
 - b. If severe respiratory distress or hypotensive despite Albuterol/Xopenex, consider Epinephrine IV/ET 0.3 mg 1:10,000 (Pediatric: 0.01 mg/kg) or IM 0.3 - 0.5 mg of 1:1,000 (Pediatric: 0.01 mg/kg, max 0.3 mg). Repeat in 10 minutes if necessary.
 - c. If severe respiratory distress, consider:
 - i. Ketamine 0.5 – 2 mg/kg IV/IO IM.
 - ii. MgSO₄ 1-2 gm IV slow infusion.
 - d. If ventilation is required, allow for a prolonged expiratory phase to prevent barotrauma. Consider chest compression to assist with expiratory phase.
5. If apparent choking:
 - a. If patient is unconscious, use direct laryngoscopy and Magill forceps to remove foreign body.
6. Consider Fentanyl or Hydromorphone for air hunger in severe shortness of breath.

SEIZURES

Additional ALS Indicators

First time seizure

Multiple seizures in same day

Seizure longer than five (5) minutes

Severe headache

Seizure due to:

1. Hypoglycemia
2. Hypoxia
3. Trauma
4. Drugs or alcohol
5. Pregnancy

BLS Care

1. Obtain a detailed medical history including details of seizure, past seizure history, medications, drug and alcohol use, diabetes history and recent head injury.
2. During seizure, position the patient on his/her side and protect from injury. Note duration and type of seizure activity in verbal and written reports.
3. Provide oxygen during seizure and immediate post-ictal period.
4. Obtain blood glucose and measure temperature.
5. Perform exam to evaluate for neurologic deficits and trauma sustained
6. Transport
 - a. EMS transport required for first time seizure, more than one seizure in 24 hrs, or atypical seizure for the patient.
 - i. Febrile seizures are always generalized tonic/clonic in nature. Any focal seizure is not a febrile seizure until proven otherwise
 - b. Patient may not require transport to the ED if the patient has a seizure history, seizure was typical for their pattern, has returned to baseline mental status, and is with a responsible person. Suggest that the patient follow-up with a physician at the next available time. Discuss with Medical Control if uncertain.
 - c. Patient may go to the ED or PCP by POV if febrile seizure is suspected, patient is 6 months to 3 years old, and had only one seizure lasting under 5 minutes. Contact the receiving physician prior to patient departure.

ALS Care

- 1) NS IV/IO or saline lock if:
 - a) Seizure lasted more than 5 minutes.
 - b) More than one seizure in 24 hours.

- c) Suspected hypoglycemia.
 - d) Suspected electrolyte imbalance.
 - e) Pregnancy.
- 2) For ongoing seizures or status epilepticus:
- a) Midazolam 4mg IV/IO/IM (Pediatric: 0.05 - 0.1 mg/kg, max 4mg) or MAD 0.3 mg/kg (max dose 5mg). Repeat every 5 minutes as needed for status seizures.
 - b) For seizure persisting after 2 doses of Midazolam (10 minutes after initial dose), consider adding 1-2 mg/kg Ketamine IV/IO/IM.
 - c) Consider intubation once treating with third round of medications (~10-15 min).
- 3) If blood glucose <70 mg/dL, give dextrose as outlined in Hypoglycemia Protocol.
- 4) If fever, remove clothing to cool patient (but prevent shivering).
- a) Acetaminophen for fever >38° C (100.3° F): Adult dose 1000 mg, Pediatric dose 15 mg/kg (max 1000mg)
 - b) If patient is unconscious or unable to take orally, administer rectal acetaminophen 20 mg/kg (max 1000 mg).
- 5) If patient is over 20 weeks pregnant and is seizing or has had recent seizure:
- a) Magnesium Sulfate 6g IV/IO over 15-20 min or 5g IM into each buttock (total 10g)
 - b) If seizure is persistent despite Magnesium, administer Midazolam per above and consult Medical Control.

STROKE

Additional ALS Indicators

Severe hypertension (SBP > 185mmHg or DBP > 110 mmHg)
Severe headache/vomiting

BLS Care

1. Determine time onset of stroke or last known normal
2. Perform **BEFAST** assessment
 - i. Balance (assess for sudden change in balance or coordination, i.e., assess gait for ataxia as patient transfers to gurney)
 - ii. Eyes (assess for acute blurred vision or loss of vision in one part of visual world)
 - iii. Facial Droop (Assess for paralysis of one side of face with smiling and eye closure)
 - iv. Arm Drift (Ask patient to hold arms outstretched in front and assess whether one arm drifts compared to the other)
 - v. Speech (Assess for slurred speech, inappropriate words or muteness)
 - vi. Time (Time when patient was last seen normal)
3. Measure blood glucose and temperature
4. Transport:
 - i. Stroke signs with onset <4.5 hours with no ALS indicators = Air or BLS Code Red
 - ii. Stroke signs with onset >4.5 hours with no ALS indicators = BLS Code Yellow
 - iii. Notify medical control as soon as possible

ALS care

1. Size 20g or larger IV or IO, TKO or saline lock.
2. Cardiac monitor, 12-lead ECG
3. If SBP > 185 or DBP > 110, consider medications such as nitroglycerin or anxiolytics. Discuss with Med Control.

SYNCOPE

BLS Care

1. Check blood glucose.
2. Neurologic exam.

ALS Care

1. Continuous cardiac monitoring.
2. Assess EKG for arrhythmia, ischemia, long QT, WPW, HCM, and Brugada.
3. NS IV/IO TKO or Saline Lock.

TRAUMA

Additional ALS Indicators

Head injury with new paralysis, focal weakness, or numbness

BLS Care

1. Expedite scene time as much as possible.
2. Assess ABCs and GCS

CATEGORY	CRITERIA	
EYE OPENING	Opens eyes spontaneously	4
	Opens eye to loud command	3
	Opens eyes to pinch	2
	Does not open eyes	1
BEST MOTOR RESPONSE	Follows simple commands	6
	Pulls tester's hand away	5
	Withdraws from pinch	4
	Decorticate posturing	3
	Decerebrate posturing	2
	No response to pinch	1
VERBAL RESPONSE	Oriented time, place, person	5
	Confused, disoriented	4
	Talks, makes no sense	3
	Unintelligible sounds	2
	No verbal sounds	1
Glasgow Coma Scale Total		

3. Expose patient, perform secondary survey, and obtain more thorough history of the event.
4. Head trauma:
 - a. If low suspicion for spinal injury based on exam, complaints, and mechanism, elevate head by 25-30 degrees if GCS < 9 by raising head of bed or elevating the head of the mattress
 - b. If taking blood thinners (Warfarin/Coumadin, Apixaban/Eliquis, Rivaroxaban/Xarelto, Dabigatran/Pradaxa, Lovenox, etc.), patient must be transported. Consult ER Star Doc if the patient refuses.
5. C-spine evaluation and immobilization.

- a. Recommend spinal immobilization with a “horse collar,” blocks and tape, or vacuum mattress in the following situations:

- i. Age over 65
- ii. Neurologic deficit or complaint (weakness, numbness, or paresthasias) in extremities
- iii. Dangerous mechanism
 - 1. Fall over 3 feet, 1.5x height or 5 stairs
 - 2. Axial load to the spine (i.e., diving)
 - 3. High speed (>60 mph) or rollover MVC
 - 4. Ejection of patient from vehicle
 - 5. Bicycle or motorized recreational vehicle accident
- iv. Neck pain that started immediately after the accident
- v. Tenderness on midline cervical spine palpation
- vi. Altered mental status, distraction by pain or injury, or intoxication by drugs or alcohol
- vii. Travel over rough or bumpy road.
- viii. Suspicion for spinal cord injury based on other factors



- b. Recommend spinal immobilization with a hard-cervical collar if there is suspicion for spinal cord injury based on the above criteria AND good spinal immobilization in not able to be maintained due to:
 - i. Patient agitation, altered mental status, language barrier
 - ii. Difficult extrication, travel over bumpy road or other conditions causing significant head or neck movement
 - iii. Poor immobilization with above methods
- c. In penetrating trauma, spinal immobilization is not indicated, unless direct injury to the spinal column is evident or suspected.

6. Dental trauma

- a. Place avulsed/dislodged teeth in milk or patient’s saliva and transport with the patient.

7. Eye trauma:

- a) Stabilize impaled objects in place, avoiding any pressure on the eye, and cover both eyes with cups or dressings.

8. Chest Trauma

- a. Cover sucking chest wounds with occlusive dressing and tape on three sides.

9. Abdominal trauma:

- a. Evisceration: Apply saline soaked bulky dressing. Do not replace organs in abdomen.
- b. Stabilize impaled objects.

10. Apply Pelvic Sling if significant trauma with signs of shock or for suspected open-book pelvic fractures per Pelvic Binder Placement protocol.

11. Extremity trauma:

- a. Refer to “Splinting/Traction” protocol

- b. Elevate injured limb if possible and apply cold packs to injured area.
12. Amputation:
- a. Wrap amputated parts in sterile dressings, then place in a watertight container and then in a second container. Place the container on ice or chemical cold pack.
 - b. Do not submerge the amputated part in water, place directly on ice, or use dry ice.
13. Soft tissue injuries:
- a. Control external bleeding with:
 - i. Direct pressure – apply firm manual pressure or pressure dressing to the area of bleeding.
 - ii. Topical coagulant
 - 1. Expose wound and identify actively bleeding tissues. This may require removal of superficial clots.
 - 2. Apply topical coagulant product (chitosan based non-thermogenic product such as Celox preferred)
 - 3. Apply firm pressure for up to 3 minutes then repeat if bleeding has not stopped completely.
 - iii. Tourniquet – used for uncontrollable bleeding from limb wounds. Avoid on limbs with dialysis fistulas. A commercially produced tourniquet is preferred.
 - 1. Expose the limb completely and apply the tourniquet just above the wound. Do not apply across joints if possible.
 - 2. Tighten tourniquet until bleeding stops.
 - 3. Write the time of application on the patient’s skin or on tourniquet, i.e., TK 1645
 - 4. Initiate rapid transport, notifying ER of tourniquet placement.
 - iv. Dressing and bandaging:
 - 1. Wear appropriate personal protective equipment.
 - 2. Secure the dressing with a bandage that is snug but does not impair circulation, unless a tourniquet is required.
 - 3. Large, easily removed debris, such as glass, splinters, or gravel should be removed before bandaging. Secure deeply imbedded fragments or projectiles in place with the bandage.
 - 4. Leave patient’s fingers or toes exposed if possible and assess distal circulation after dressing application with pulse or capillary refill.
14. Use rigid spine board only temporarily as needed for extrication. Transfer to a vacuum-splint or gurney as time and condition allow.
15. Early notification to the ED to determine if Trauma Code should be called.

ALS Care

- 1. Obtain 2 large bore IVs or IOs if significant trauma. Do not delay transport for vascular access.
- 2. Head trauma:
 - a. Intubate for GCS < 9

- b. For signs of herniation (declining GCS, dilated pupils, posturing, Cushing's Triad -- bradycardia, hypertension, irregular respirations)
 - Hyperventilate to maintain ETCO₂ at 33- 35mm/hg.
 - Administer Hypertonic Saline 250cc bolus IV.
3. Eye trauma:
 - a. Instill Proparacaine 1-2 ophthalmic drops one time into the affected eye as needed for pain due to suspected corneal abrasion. Contraindicated if suspected punctured/ruptured globe.
4. Chest trauma:
 - a. Perform needle thoracostomy for signs of tension pneumothorax (tachycardia, hypotension, decreased lung sounds and tracheal shift).
5. Extremity trauma:
 - a. Attempt to realign (open or closed) long bones fractures with compromise of distal circulation, or if needed to facilitate packaging for transport.
 - If resistance to movement is encountered or pain is too severe, discontinue realignment efforts and immobilize in place.
 - Administer pain or sedation medications as needed to facilitate realignment.
 - Check and document CMS before and after splinting and/or realignment.
6. Administer TXA 1g bolus IV if significant mechanism and signs of shock.
7. Traumatic Cardiac Arrest:
 - a. Consider needle thoracostomy and pericardiocentesis early in resuscitation with penetrating trauma to the chest or blunt trauma with significant mechanism
8. Treat pain and anxiety with Hydromorphone, Fentanyl, Midazolam, Ketamine or Nitrous Oxide as needed per medication protocols.

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CPAP (CONTINUOUS POSITIVE AIRWAY PRESSURE)

Indications

1. CHF with suspected pulmonary edema and SOB indicated by signs such as rales or coarse wheezes, pedal edema, hypertension, and/or elevated JVD.
2. Near drowning.
3. Reactive airway disease exacerbation (Asthma, COPD)
4. Other causes of acute pulmonary edema (i.e., Hydrogen Fluoride inhalation, allergic reaction, transfusion reaction, etc.)

Contraindications

1. Age < 8 (due to mask size).
2. Systolic BP < 90.
3. Suspected pneumothorax.
4. Depressed level of consciousness (i.e., unable to remove mask independently).
5. Major head or facial trauma.
6. Active vomiting.
7. Pulmonary fibrosis (relative – use with caution).

Procedure

1. Place patient in seated position.
2. Connect tubing to appropriate-sized mask and to oxygen source.
3. Place mask on patient and ensure a good seal.
4. If patient becomes anxious/agitated, consider mild sedation using Midazolam, Ketamine, or Hydromorphone.

CRICOTHYROTOMY/TRANSTRACHEAL JET VENTILATION

Indications

1. Hypoxia or apnea requiring definitive airway, and
2. Inability to intubate the trachea and failure of alternative airway to provide adequate ventilation or oxygenation due to causes such as edema of the glottis, fracture of the larynx, severe oropharyngeal bleeding, severe maxillofacial injuries, or complete airway obstruction.

Contraindications

Ability to intubate the trachea or maintain adequate oxygenation and ventilation by other means.

Methods

1. Surgical Cricothyrotomy/ Field Pack.
2. Needle Cricothyrotomy with jet ventilation. (Preferred method under age 12)

DOPPLER

Indications

1. Assess pulse in possible ischemic limb
2. Assess pulse during pulse check in cardiac arrest resuscitation
3. Assess quality of compressions during CPR.

Cautions and contraindications

Do not use on non-intact skin.

Procedure

1. Turn on doppler and apply gel to the tip.
2. Place doppler tip over artery to be assessed (radial, dorsalis pedis, posterior tibialis, femoral). Recommend placing over femoral pulse for cardiac arrest resuscitations.
3. Listen for whooshing sound to signify pulse wave.

END-TIDAL CAPNOGRAPHY

Indications

1. Verification of endotracheal tube placement.
2. Monitoring of ventilation in intubated patients
3. To identify and monitor hypercapnia in patients with SOB.
4. To monitor for apnea/hypopnea in patients with opiate overdose.
5. To monitor quality of CPR and prognosis in cardiac arrest.

Procedure

1. All patients should have a continuous waveform with each peak indicating a breath.
 - a. If EtCO₂ decreases below 35 and RR is < 6, patient may need ventilatory assistance or naloxone in the case of opiate overdose.
2. If very elevated EtCO₂ (i.e., >55), patients may be retaining CO₂ due to COPD, asthma or another cause and require medications or ventilatory assistance.
3. In intubated patients:
 - a. a very low EtCO₂ value (i.e., < 20) and lack of waveform may indicate tube misplacement.
 - b. Ventilate to maintain EtCO₂ between 35-45.
4. Cardiac arrest:
 - a. Once intubated, monitor EtCO₂. Try to improve CPR quality to attain EtCO₂ >30.
 - b. Generally, if EtCO₂ is still <20 after resuscitation, there is a poor prognosis for attaining ROSC in cardiac arrest.
5. Document in the ePCR:
 - a. The initial ETCO₂ value and the presence of a good wave form.
 - b. ETCO₂ value every 5 minutes.

ENDOTRACHEAL INTUBATION

Indications

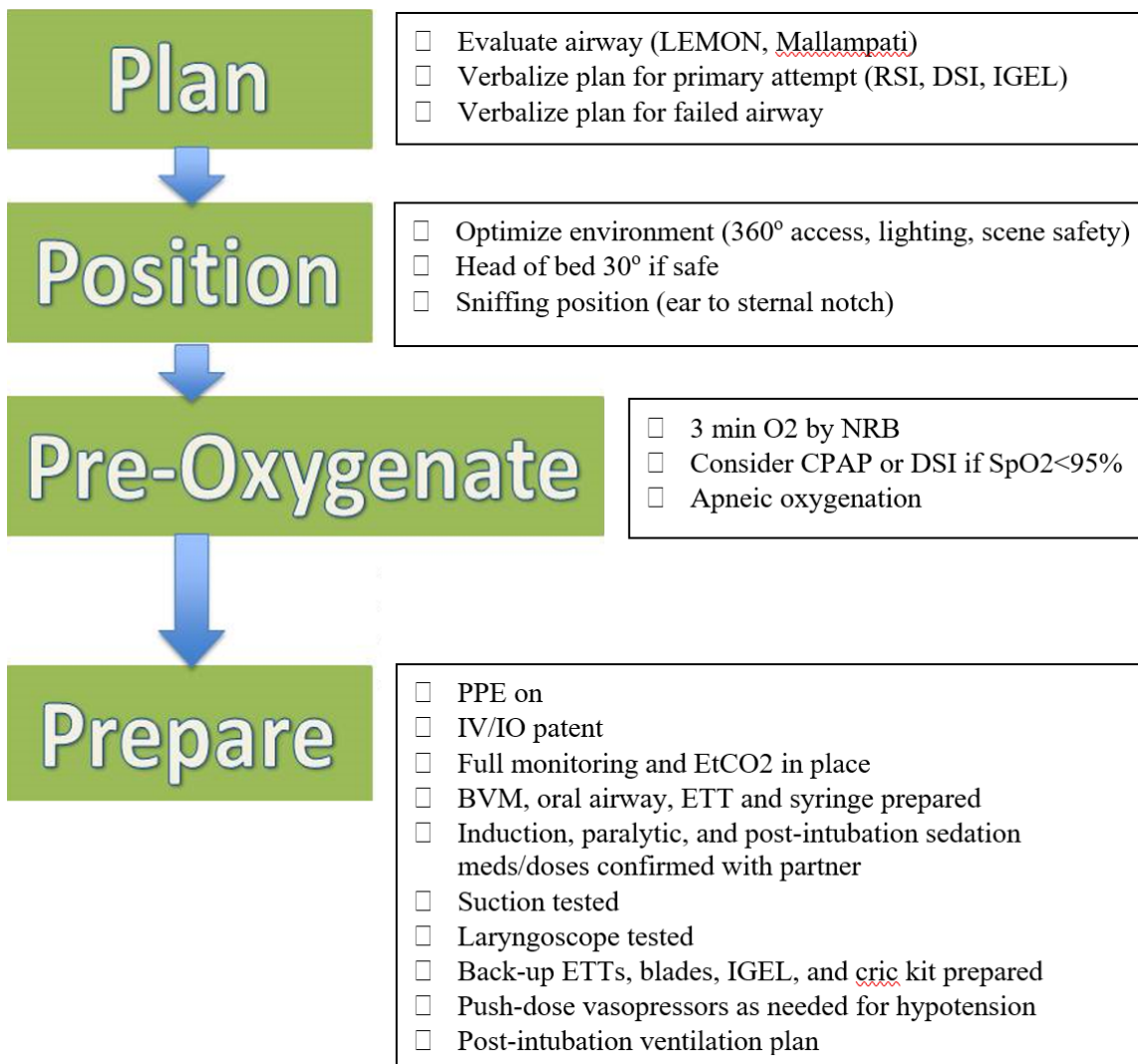
1. Cardiac arrest
2. Impending airway compromise due to decreased mental status, vomiting, trauma, swelling or other cause
3. Respiratory failure where less invasive measures are not successful or inappropriate
4. Combative patients requiring a high level of sedation.

Procedure

1. General principles:
 - a. Optimize scene and patient positioning before administering medications
 - b. If acute trauma with possible cervical spine injury, designate one provider to maintain in-line cervical spine stabilization manually during intubation, then replace cervical collar after intubation.
 - c. Pre-oxygenate with high flow oxygen (15 L/min) through NRB or gentle BVM for at least 3 minutes prior to intubation. Additionally, place high flow oxygen through nasal cannula with second oxygen source and maintain during intubation, until airway is secured.
 - d. Test laryngoscope and suction prior to medication administration.
 - e. Use video laryngoscopy preferentially.
 - f. Strongly consider use of Eschmann/Bougie as an additional tool to confirm tracheal intubation in all intubations, by feeling tracheal rings followed by placing ET tube over the introducer.
 - g. Treat hypotension with IV fluids or push-dose epinephrine per protocol. Ensure adequate blood pressure prior to induction of intubation.
 - h. Read Pre-Intubation Checklist out loud prior to every intubation with the exception of cardiac arrest with ongoing CPR.
 - i. In pediatric patients in shock or under age 1, consider administration of atropine 0.02 mg/kg (min dose 0.1 mg, max dose 0.5mg) prior to induction
2. If attempt fails, ventilate and reoxygenate with BVM to saturations at least in the high 90s if possible before attempting intubation again
 - a. Change at least one parameter (intubator, technique, use of Eschmann tube introducer, size of tube or blade, positioning, etc.).
 - b. If unsuccessful after 3 attempts, place supraglottic airway.
 - c. If inadequate oxygenation or ventilation with supraglottic airway, proceed with cricothyrotomy.
3. Rapid sequence intubation:
 - a. Indications:
 - Intact gag reflex
 - GCS > 3
 - b. Administer Midazolam 5-10 mg IV/IO or ketamine 1-2mg/kg IV/IO.

- c. Immediately administer Rocuronium 1.0 mg/kg.
4. Delayed sequence intubation:
 - a. Indications:
 - Inability to adequately pre-oxygenate patient due to combativeness, altered mental status or other cause
 - b. Administer Midazolam 5-10 mg IV/IO or ketamine 1-2mg/kg IV/IO
 - c. Administer O2 by NRB and then BVM if patient becomes apneic until patient has had SpO2 > 95% for at least 2 minutes ideally.
 - d. Administer Rocuronium 1.0 mg/kg and proceed with intubation.
5. Post-intubation:
 - a. Verify and document ET tube placement with at least three methods:
 - ETCO₂ waveform and value
 - Bilateral breath sounds, absent epigastric sounds.
 - Mist in the tube.
 - Chest rise
 - b. Secure tube approximately at 21 cm at teeth for females, 23 cm at teeth for males.
 - c. Attach patient to ventilator preferably. If BVM is required, take care not to hyperventilate.
 - d. Administer oxygen only as needed to maintain SpO2 92-95% (or 88-92% in patients with COPD)
 - e. Decompress stomach with OG or NG tube.
 - f. Continue sedation post-intubation with Midazolam 1-2 mg every 5-10 minutes.

PRE-RSI CHECKLIST



I-GEL SUPRAGLOTTIC AIRWAY PLACEMENT (ALS OR BLS WITH ENDORSEMENT)

Indications

1. Cardiac and/or respiratory arrest.
2. Unconscious patient without a gag reflex.
3. Failed intubation by ALS providers

Contraindications

1. Responsive patient with intact gag reflex.
2. Caustic ingestions.
3. Upper-airway obstructions due to foreign bodies or pathology.

Procedure

1. Slide IGEL into throat with airway opening oriented inferiorly until unable to advance further.
 - a. Tutorial:
https://www.youtube.com/watch?annotation_id=annotation_903037127&feature=iv&src_vid=ao-Sb_OulE8&v=ae1Yr0fbz98
2. Confirm correct placement by lung sounds, chest rise and positive trending pulse oximetry.
 - a. If unable to confirm by these parameters, remove and resume ventilating with BVM and OPA.
3. If patient develops a gag or begins breathing, suction and remove IGEL.

Weight-based sizes

1. Small adult: Size **3** (yellow), 30-60 kg (65-130 lbs)
2. Medium adult: Size **4** (green), 50-90 kg (110-200 lbs)
3. Large adult: Size **5** (orange), 90+ kg (200+ lbs)

INTRAOSSUEOUS PLACEMENT

Indications

1. In cardiac arrest, concurrently with attempts to establish an IV.
2. In critically ill patients with urgent need for IV access and in whom IV placement has failed twice or is unobtainable.

Contraindications

1. Infection at or near insertion site.
2. Suspected or known fracture of the extremity being used.
3. History of orthopedic surgery near insertion site (joint replacement, hardware in place).

Preferred sites

1. Humeral Head (See diagrams below):
 - a. Adult/Pediatric: Anterior humeral head at base of greater tubercle (approximately 2 finger widths inferior to line between the coracoid process and the acromion). Adduct humerus (palm over abdomen) and position elbow on ground/gurney.
2. Proximal Tibia:
 - a. Adult: 1 finger width medial to the tibial tuberosity.
 - b. Pediatric:
 - i. If tibial tuberosity CAN be palpated: 1 finger width below the tuberosity and then medial along the flat aspect of the tibia.
 - ii. If tibial tuberosity CANNOT be palpated: 2 finger widths below the patella and then medial along the flat aspect of the tibia.
3. Anterior Distal Femur:
 - a. Adult/Pediatric: Identify the anterior midline of the distal femur 1-2 finger widths above the patella. Bariatric needle is required for adult patients and consider the adult needle on Pediatric patients.
4. Distal Tibia (Medial Malleolus):
 - a. Adult: 2 finger widths proximal to the medial malleolus on the distal tibia.
 - b. Pediatric: 1 finger width proximal to the medial malleolus on the distal tibia.

Equipment

1. EZ-IO drill and Adult (>40 kg), Pediatric (3 – 39kg), or bariatric needle per patient size and insertion site.

Special Considerations

1. All fluids and medications may be given by intraosseous route.
 - a. Pressure infusion is required in most cases. Flush catheter with a 10 ml saline syringe prior to fluid challenge.
2. When placing an IO in a conscious patient:
 - a. Administer Lidocaine 40 mg (2cc of 2% Lidocaine) and allow it to sit in the catheter for 2 minutes, then flush with 10ml saline. May repeat with Lidocaine 20mg (Pediatric 0.5 mg/kg).

Removing an IO

1. An IO may be removed in the field if the patient does not require transport. Puncture site should be properly cleaned and covered with a Band-Aid.

LUCAS DEVICE USE

Indications

1. Cardiac Arrest requiring CPR.

Contraindications

1. Too small (approximately age 8 or small chest wall) or too large for device (plunger is unable to come down to chest wall)

Instructions:

1. Position so that the piston is over the lower sternum.
2. **Use the neck strap** when the LUCAS device is in use at all times.
3. Observe for and stop and reposition the device if any migration of the piston below the xyphoid process or to the upper sternum.

NEEDLE THORACOSTOMY

Indications

1. Signs and symptoms of pneumothorax:
 - a. Respiratory distress.
 - b. Subcutaneous air over chest wall or neck.
 - c. Decreased lung sounds on one side.
 - d. Tracheal deviation
 - e. Hypotension and tachycardia.

Insertion sites on the affected side are in the following preferred order

1. The anterior axillary line, in the third or fourth intercostal space.
2. The mid-clavicular line, in the second intercostal space.
3. Special Considerations
 1. Raise patient's arm above their head prior to insertion to expose ribs and decrease chest wall thickness.
 2. Needle placement should always be just superior to the rib, to avoid blood vessels on inferior margin of rib.
 3. Rush of air should be detected upon placement to confirm intrapleural placement.
 4. Monitor closely through transport for continued leak of air or blood.
 5. If the patient continues to deteriorate, insert a second needle in an alternate chest wall site.

PERICARDIOCENTESIS

Indications

1. A patient in shock with suspected pericardial tamponade based on:
 - a. Exam findings including jugular venous distension, hypotension, muffled heart tones, and “pulsus paradoxus” (a drop of systolic blood pressure of more than 10 mmHg with inspiration)
 - b. A suggestive history, possibly including recent MI, uremia (i.e., in chronic renal failure), metastatic cancer to pericardium, pericarditis, and penetrating trauma to the chest.
2. Cardiac arrest with suspected pericardial tamponade.

Procedure:

1. Insert long needle below the xyphoid and direct upward toward the left shoulder at 45-degree angle.
2. Advance slowly while aspirating to avoid puncturing the heart.
3. As soon as fluid is aspirated, stop advancing and withdraw until fluid return slows or there is an increase in resistance, then withdraw the needle.

PELVIC BINDER PLACEMENT

Instruction for Use

1. The Pelvic Sling is the preferred pelvic binder device. If hip circumference is too small or large for the splint (< 32 or > 50 inches), tie a sheet tightly around the iliac wings.
2. Approximate size by circumference around hips and buttocks (not waist)
 - a. Large: 36 – 60 inch circumference
 - b. Standard: 32 – 50 inch circumference
 - c. Small: 27 – 47 inch circumference
3. Review use instructions on the package.
 - a. Clothing should be removed before placing the Sling.
 - b. Apply with buckle centered over the pubic symphysis.

SPLINTING / TRACTION

Appropriate splinting can reduce or minimize dislocation, hemorrhage, swelling, and pain.

Indications:

1. Deformed fractures / dislocations with compromised distal pulse or capillary refill
2. Deformed fracture / dislocation where realignment is necessary to facilitate packaging for transport.
3. Mid-shaft femur fracture is suspected without suspected fracture of the lower leg, knee, hip or pelvis.

GENERAL PRINCIPLES

1. Remove or cut away clothing.
2. Dress and bandage significant wounds using a sterile dressing.
3. Check CMS distal to injury before and after splinting.
4. If distal pulse or capillary refill is compromised, attempt to realign fracture into anatomical position until the pulse returns, excessive pain is felt, or resistance is encountered. If resistance to movement is encountered or pain is too severe, discontinue realignment efforts and immobilize in place.
5. Immobilize joints above and below injured bones.
6. Pad splints generously.
7. Elevate extremity after splinting, if possible.

Midshaft femur fractures

1. Size splint to uninjured leg
2. Have one EMT stabilize the injured leg while the other applies the traction device. The preferred traction device in Whatcom County is the Kendrick Traction Device.
3. Apply groin strap, ankle hitch, and knee strap. Extend the splint and apply the thigh and calf straps.

TRANSCUTANEOUS PACING

Indications

1. Symptomatic bradycardia
2. Overdrive pacing in repetitive monomorphic VT

Procedure

1. Place pads in AP position
2. Push “Pacer” on monitor and set to Demand mode
3. Set rate to 70 or to 10 bpm above patient’s intrinsic rate, whichever is higher
4. Set mA to 70
5. Start pacing and increase mA until electrical capture on monitor and mechanical capture as evidenced by pulse
 - a. If capture is not achieved by 130 mA, reassess electrode positioning and consider adjusting pad position then repeat above
 - b. Once capture is achieved, set current at 5-10 mA above level of capture
6. If symptoms have not improved (i.e., improvement of mental status, dizziness, chest pain, SOB, etc), titrate the rate until improvement
7. Overdrive pacing
 - a. Follow instructions above and set Mode to “Fixed” and Rate to 90-110 bpm. This may prevent Torsades by shortening the QT interval and preventing PVCs.
 - b. Be prepared to defibrillate if VF or persistent VT occur.
8. Sedate as needed

Complications

1. Failure to pace
2. Discomfort

COMMUNITY PARAMEDIC PROTOCOLS/GUIDELINE

Introduction

Under the community assistance referral and education services program established by RCW 35.21.930, a community can provide outreach and assistance to the residents of its jurisdiction in order to improve population health and advance injury and illness prevention. The medical oversight for these programs is provided by the EMS medical program director as authorized in RCW 35.21.930, 18.71, 18.73, 70.168, and WAC 246.976.

Whatcom County residents may be eligible to receive services from the local community assistance referral and education services program if they have:

1. Been identified as a high utilizer of the 911 system. A high utilizer is defined as a patient with a call volume that may overwhelm the local EMS resources.
2. A referral from local community agencies. Community partners who request additional outreach help for their clients.
3. Been identified as a risk for hospital readmission. Patients who are recently released from hospital needing assistance to follow-up appointments, medication use, or fall risk assessment.

Description

In Whatcom County a Community Paramedic (CP) is an individual, who in addition to utilizing all standard advanced life support (ALS) protocols, has completed MPD specialized training under WAC 246-976-024. CP performs paramedic duties through assignment to an emergency response-capable vehicle equipped with ALS equipment. Activities will be focused on those residents whose needs, and/or EMS utilization, may best be served by a more focused approach.

Activities may include the administration of medications, picking up and delivering medications to people who lack transportation, or performing various skills and procedures within current scope of practice and in accordance with established protocols under the direction of the Whatcom County Medical Program Director. CPs may also transport people who do not require ambulance transport to destinations other than a medical facility.

CPs will work with a person trained to conduct activities as an intensive case manager (ICM). The ICM provides intensive care management of the social and logistical needs of the client. This partnership facilitates patient use of, and integration with social/medical support services with a primary goal of decreasing 911 utilization for non-emergent purposes and connecting patients to appropriate resources.

Current Medications

1. PALIPERIDONE PALMITATE EXTENDED-RELEASE INJECTABLE SUSPENSION (INVEGA SUSTENNA and INVEGA TRINZA)
2. NALTREXONE EXTENDED-RELEASE INJECTABLE SUSPENSION (VIVITROL)
3. ARIPIPRAZOLE (ABILIFY) PARENTERAL LONG ACTING

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ACETAMINOPHEN TABLETS, SUPPOSITORIES, SYRUP (TYLENOL)

Pharmacologic Effects

1. An analgesic and anti-pyretic.

Metabolized

1. Onset of therapeutic effect – 30 minutes (PO).
2. Hepatic metabolism.

Indications

1. Fever.
2. Pain.

Contraindications

1. Cirrhosis.
2. Patient has received full dose acetaminophen within last 6 hours.
3. Administration would exceed max dose of 4g/day.

Pregnant patients:

Acceptable

Dosage and Administration

1. PO 500 - 1000 mg (pediatric: 15 mg/kg up to 1000mg max dose).
2. Rectal dose: 20 mg/kg for all patients (up to 1000mg max dose).

ACTIVATED CHARCOAL SOLUTION (ACTIDOSE-AQUA)

Pharmacologic Effects

1. Binds to ingested chemicals to block their absorption into the GI tract.

Metabolized

1. Charcoal passes through the GI tract without being absorbed.

Indications

1. Known or suspected toxic ingestions within 1 hour of ingestion.

Contraindications

1. Decreased level of consciousness.
2. Vomiting
3. Ingestion of:
 - Heavy metals (Iron, Zinc, Mercury, Lead, Arsenic, Cadmium)
 - Ions (i.e., Lithium, Calcium, Potassium, Magnesium)
 - Strong acids and alkalis
 - Alcohols (Ethanol, Methanol, Ethylene glycol, Isopropanol, Acetone)

Pregnant patients:

Acceptable

Dosage and Administration

1. 1 g/kg (max dose 100g)
2. Can be diluted slightly with water, milk or another liquid to increase palatability.
3. Call Med Control or Poison Control for advice prior to administration.

Adverse Effects

1. Vomiting and aspiration may cause pulmonary irritation.

ADENOSINE INJECTION (ADENOCARD)

Pharmacologic Effects

1. Slows conduction at the AV node.

Metabolized

1. Onset – immediately.
2. Duration – usually <10 seconds.

Indications

1. Stable paroxysmal regular supraventricular tachycardias that are resistant to vagal maneuvers.

Contraindications

1. Active asthma exacerbation.
2. 2nd or 3rd degree heart block or sick sinus syndrome.

Cautions

1. Wide complex tachyarrhythmia.
2. History of asthma.
3. Reduce dose to 3mg in patients on Carbamazepine (Tegretol) and dipyridamole (Persantin).

Pregnant patients:

Acceptable

Dosage and Administration

1. Doses should be given rapid IV/IO push into the most proximal IV/IO port followed immediately by a rapid saline flush.
2. Administer 12 mg. Can be repeated after a 1-2-minute interval if the tachydysrhythmia has not stopped.
3. Pediatric: 0.1 mg/kg, may be repeated.

Adverse Effects

1. VT/VF or another dysrhythmia.
2. Chest discomfort.
3. Flushing, nausea, dizziness.
4. Dyspnea.

ALBUTEROL NEBULIZED/MDI

Pharmacologic Effects

1. Selective beta-2 agonist causing smooth muscle relaxation.
2. Reactivates the sodium/potassium pump, driving potassium intracellularly.

Metabolism

1. Onset of action – 5-10 mins.
2. Duration – 3-6 hours.

Indications

1. Asthma and reversible bronchospasm.
2. Hyperkalemia.

Cautions

1. History of congestive heart failure

Dosage and Administration

1. Asthma/Bronchospasm:
MDI: give 2-8 puffs one breath at a time with aerochamber if available.
Nebulized: Adult and pediatric: 2.5-5 mg nebulized. May be nebulized continuously.
2. Hyperkalemia: 2.5 mg nebulized over 10 minutes.

Adverse Effects

1. Tachycardia/Palpitations, premature ventricular contractions.
2. Tremor, dizziness, agitation.
3. Headache, nausea/vomiting.
4. Hyperglycemia.

AMIODARONE HYDROCHLORIDE INJECTION (CORDARONE)

Pharmacologic Effects

Class III anti-arrhythmic agent with properties of all four anti-arrhythmic classes:

1. Prolongs the action potential and refractory period in myocardial tissue by inhibiting inactivated Na channels (Class I).
2. Anti-adrenergic (Class II).
3. Increases action potential duration via blockade of slow potassium channels (Class III).
4. Calcium channel blockade (Class IV).

Metabolized

1. Hepatic metabolism.

Indications

1. Pulseless VT/VF
2. Post VT/VF cardiac arrest resuscitation
3. Refractory atrial tachydysrhythmias
4. Undetermined wide complex tachydysrhythmias with a pulse. Use with caution, if at all, if WPW is suspected and consider cardioversion.

Contraindications

1. Hypotension (except in cardiac arrest)
2. Second- and Third-Degree Blocks.
3. Bradycardia.

Pregnant patients:

Avoid except in VF/VT cardiac arrest

Dosage and Administration

1. Pulseless VT/VF: 300 mg IV/IO bolus. Repeat 150 mg IV/IO bolus once for refractory VT/VF. (Pediatric: 5 mg/kg IV bolus, may repeat once).
2. Post VT/VF cardiac arrest: 150 mg IV/IO infusion over 15 minutes (Macro drip adset in 100 mL D5W @ 1 gtts/sec = approx. 18-minute infusion).
3. VT with a pulse, wide complex atrial tachydysrhythmias, or unknown wide complex tachycardia: 150 mg IV/IO infusion over 15 minutes (Pediatric: 5mg/kg IV/IO infusion over 20 min).

Adverse Effects

1. Hypotension.
2. Q-T prolongation.

COMMUNITY PARAMEDIC MEDICATIONS

ARIPIPRAZOLE (ABILIFY) PARENTERAL LONG ACTING

Pharmacologic Effects

1. Atypical antipsychotic
2. Used to treat schizophrenia and bipolar disorder
3. Modulates neurotransmission overactivity of dopamine

Metabolized (Parenteral)

1. Metabolized in the liver. Excreted in urine and feces
2. Half-life is 75 hours
3. Steady state takes 10-14 days

Indications

Must be prescribed by the patient's PCP for:

1. Schizophrenia
2. Bipolar disorder

Contraindications

1. Allergy to Aripiprazole
2. Pregnant or breastfeeding

Cautions

1. Suicidal ideation.

Dosage and Administration

2. Must be reconstituted and warmed to room temperature before administration.
3. Follow instructions for use of syringe as prescribed with sterile water
4. Comes as prefilled dual chamber syringe 300 or 400 mg.
5. Give 300 or 400 mg deep IM in gluteal or deltoid muscle as prescribed by PCP
6. Monitor for suicidal ideation in patients with history of SI

Adverse Effects

1. Injection site pain
2. Extrapyramidal symptoms
3. Sedation
4. Hyperglycemia and weight gain
5. Increased risk of CVA
6. Increased fall risk and orthostatic hypotension
7. Esophageal dysmotility and aspiration risk

ASPIRIN TABLETS

Pharmacologic Effects

1. Inhibits platelet function in clot formation for 1 week.
2. An antipyretic, anti-inflammatory agent, and inhibitor of prostaglandin production.

Metabolized

1. Hepatic metabolism.

Indications

1. Chest pain or suspected acute coronary syndrome.

Note: May be omitted if the patient has taken ≥ 162 mg of aspirin immediately prior to your arrival.

Contraindications

1. Aspirin or NSAID (i.e., Ibuprofen) allergy
2. Suspected aortic dissection based on history of aortic dissection, sudden onset chest pain radiating to the back, difference in blood pressure measurements between arms, etc.
3. Recent GI bleeding, surgery, or other non-compressible site of recent/active bleeding

Cautions

1. Patients with asthma or reactive airway disease.
2. Patients on anticoagulants such as Coumadin.

Pregnant patients:

Withhold except in STEMI

Dosage and Administration

1. 324 mg, preferably taken orally in chewable tablet form.

Adverse Effects

1. May induce a reactive airway attack.

ATORVASTATIN (LIPITOR) TABLET

Pharmacologic Effects

1. Statin (HMG CoA reductase inhibitor)
2. Reduces LDL (low-density lipoprotein) and triglycerides, increases HDL (high-density lipoprotein).
3. Reduces acute inflammation and platelet adhesion (reduces reperfusion injury)

Metabolized

1. Hepatic

Indications

1. Acute STEMI.

Contraindications

1. Known allergy to statins.

Cautions

1. Consider giving half the dose (40mg) in the presence of known serious liver disease.

Pregnant patients:

Contraindicated

Dosage and Administration

1. 80 mg tablet PO

Adverse Effects

1. Rare muscle cramping after a single dose.

ATROPINE SULFATE INJECTION

Pharmacologic Effects

1. Cardiac: Increases firing rate of sinoatrial node & cardiac tissue conduction velocity by decreasing parasympathetic/vagal stimulation.
2. Non-Cardiac: Parasympathetic nervous system blockade causing pupillary dilation and cycloplegia, decreased secretions, and decrease in bladder tone and GI motility.

Metabolized

1. Hepatic.

Indications

1. Bradycardia resulting in hypotension, chest pain, SOB, decreased mentation, and/or ventricular irritability (ventricular escape beats).
2. Organophosphate poisoning (insecticides, herbicides, nerve gas) as directed by Poison Control Center or Med Control.
3. Pre-treatment prior to intubation in pediatric patients < 1 year of age or in shock.

Cautions

1. Patients with glaucoma (increased pressure in eyes).
2. Atrial fibrillation/flutter (unless life threatening slow atrial fibrillation).

Pregnant patients:

Acceptable

Dosage and Administration

1. Symptomatic bradycardia: Initially 0.5 mg rapid IV/IO push (minimum dose 0.3 mg), followed by incremental doses of 0.5 mg every 3 - 5 minutes, not to exceed a total dosage of 3 mg.
2. Organophosphate poisoning: 5 mg bolus followed by 1-2 mg IV every 15-30 mins or as directed by Poison Control/Med Control.
3. Pediatric: 0.02 mg/kg (min dose 0.1 mg, max dose 0.5mg).

Adverse Effects

1. Cardiac:
 - a. Arrhythmias and interval changes.
2. Non-Cardiac
 - a. Dryness of mouth.
 - b. Ocular: acute angle closure glaucoma, dry eyes, blurred vision.
 - c. Urinary retention, constipation, nausea.
 - d. Restlessness, irritability, or change in mental state.

CALCIUM CHLORIDE INJECTION

Pharmacologic Effects

1. Affects cell membrane permeability to sodium and potassium.
2. Decreases myocardial excitability in hyperkalemia.
3. Increases force of myocardial and skeletal muscle contraction.

Metabolized

1. Renal

Indications

1. Hyperkalemia
2. Tetany post thyroid or parathyroid surgery.
3. For suspected hypocalcemia in cardiac arrest patients (i.e., on high dose calcium channel blockers)
4. Calcium channel blockers use with symptomatic bradycardia.
5. Reverses effects of Magnesium Sulfate (i.e., respiratory depression of newborn baby after mother was given Magnesium Sulfate prior to delivery).
6. Hydrogen Fluoride topical exposure.

Contraindications

1. Digoxin use – calcium chloride administration may result in fatal dysrhythmias
2. Hypercalcemia.

Pregnant patients:

Acceptable

Dosage and Administration

1. IV/IO: 500 mg - 1 g. Pediatric: 5 - 7 mg/kg (max 200 mg).
2. Prevent and monitor for extravasation given this may cause tissue sloughing.
3. Do not mix with Sodium Bicarbonate in running IV/IO (will precipitate).
4. Topical for HF exposure: mix with lubricant gel and apply topically.

Adverse Effects

1. Hypotension.
2. Bradycardia.

CETIRIZINE TABLETS (ZYRTEC)

Pharmacologic Effects

1. H₁ blocker with theoretically less drowsiness compared to first generation H₁ blockers such as diphenhydramine given less crosses blood brain barrier.
2. Onset of action 20 minutes, peak effect in 1 hour. Duration 24 hours.

Metabolized

1. By the kidneys and liver.

Indications

1. Anaphylaxis and allergic reactions where patient can manage oral intake.

Cautions

1. Kidney or liver disease.

Pregnant patients:

Acceptable

Dosage and Administration

1. Ages 6 and up: administer 10mg tablet. May chew or swallow.
2. Ages 1-5: administer ½ tablet (5mg).

Adverse Effects

1. Sedation/Drowsiness.
2. Dry mouth.

CYANOKIT - HYDROXOCOBALAMIN

Pharmacologic effects

1. Hydroxocobalamin combines with Cyanide to make Cyanocobalamin (Vitamin B12) which is excreted renally.

Indications

1. Suspected cyanide poisoning (see Carbon Monoxide Exposure protocol).

Pregnant patients:

Acceptable

Dosage and Administration

1. Incompatible with many resuscitation drugs, therefore, should not be infused into the same IV line.
2. May affect CO and blood glucose measurements. Obtain values prior to administration.
3. Reconstitute with 200 cc NS.
4. Invert and roll the bottle (do not shake) for 30 seconds.
 - a. Mixed solution should be dark red and particulate free.
5. Administer over 15 minutes:
 - a. Adult: 5g (200 ml), 4-5 gtt/sec. (The Cyanokit adset is 20 gtt/ml)
 - b. 6-13 years: 2.5g (100 ml), 2 gtt/sec.
 - c. 3-5 years: 1.25g (50 ml), 1 gtt/sec. d. 0-2 years: .625g (25 ml), 0.5 gtt/sec.

Adverse Effects

1. Nausea/vomiting.
2. Abdominal pain.
3. Headache.
4. Dizziness.
5. Red skin and red urine.

DEXTROSE

Pharmacologic Effects

1. Energy source for cellular metabolism.

Indications

1. D5W: To provide a vehicle for the mixing and administration of medications.
2. D10W: Hypoglycemia, defined as a blood glucose (BG) of 70 mg/dL or less in adults, a BG < 50 mg/dL in children, and a BG < 40 mg/dL in neonates.

Caution:

1. If patient is an alcoholic, transport patient and notify ED that dextrose was administered.

Pregnant patients:

Acceptable

Dosage and Administration

1. D5W: Mix and administer as instructed for specific medications.
2. D10W: Give 1cc/kg of D10 IV/IO bolus (2cc/kg in neonates). May repeat if required to goal BG > 80 mg/dL.
3. Prevent and monitor for extravascular infusion which may cause tissue sloughing.

DILTIAZEM HYDROCHLORIDE (CARDIZEM)

Pharmacologic Effects

1. Calcium Channel blocker.
2. Decreases automaticity of all pacemaker tissues, including SA node.
3. Slows conduction through AV node via increased refractory period.
4. Decreases contractile force of ventricles with some negative inotropic and chronotropic effect.
5. Decreases coronary artery vasospasm.

Metabolism

1. Metabolized by the liver.
2. Onset of Action: IV 2 – 4 minutes

Indications

1. Narrow complex supraventricular tachydysrhythmias needing rate control (i.e., atrial fibrillation and SVT) without obvious non-cardiac cause such as sepsis, hypovolemia or trauma.

Contraindications

1. Wide complex tachydysrhythmias.
2. Advanced AV heart block (second degree or complete)
3. Wolf-Parkinson-White (WPW)
4. Pediatric patients less than 1 year of age without consent of medical control.
5. Bradycardia.
6. Hypotension
7. Tachycardia secondary to sepsis and/or hypovolemia (non-cardiac cause)

Cautions

1. Patients on beta blockers

Pregnant patients:

Acceptable

Dosage and administration

1. 0.25 mg/kg (max 20 mg per dose) slow IV over 1-2 min. May repeat if needed in 10-15 min.

Adverse Effects

1. Hypotension, dizziness, headache.
2. Dysrhythmia, bradycardia, AV block
3. VT/VF (if WPW or other accessory pathway)

DIPHENHYDRAMINE INJECTION (BENADRYL)

Pharmacologic Effects

1. Antihistamine
2. Sedative effect
3. Anticholinergic (blocks acetylcholine).

Metabolized

1. Hepatic and renal.

Indications

1. Allergic reactions.
2. Severe dystonic reactions due to phenothiazines (e.g. Haldol, Compazine, Thorazine).
3. Nausea in pregnancy.

Cautions:

1. Long QTc or known long QT syndrome

Pregnant patients:

Acceptable

Dosage and Administration

1. Adult dose is 25-50 mg (Pediatric: 0.5 - 1 mg/kg) slow IV/IO push (over two minutes) or IM injection.

Adverse Effects

1. Sedation/Drowsiness.

EPINEPHRINE HYDROCHLORIDE INJECTION (ADRENALIN)

Pharmacologic Effects

1. Alpha and beta agonist:
 - a. Increases blood pressure through peripheral vasoconstriction and increased force of myocardial contraction.
 - b. Increases pulse rate by increasing conduction velocity through the A-V node.
 - c. Bronchodilator.

Metabolized

1. Hepatic.

Indications

1. Cardiac arrest (i.e. Asystole, PEA, Refractory VF, and pulseless VT).
2. Shock/hypotension
3. Symptomatic or unstable bradycardia
4. Anaphylaxis / Severe allergic reactions.
5. Severe asthma.
6. Croup / Epiglottitis.

Contraindications

1. Severe cardiac disease (except in life-threatening conditions).
2. Dysrhythmias.

Cautions

1. Hypertension.
2. Elderly patients.
3. Heart disease.
4. Hemorrhagic or hypovolemic shock.

Pregnant patients:

Acceptable

Dosage and Administration

1. Anaphylaxis / Severe Allergic Reactions / Severe Asthma:
 - a. 0.3 mg 1:1,000 IM (Pediatric: 0.01 mg/kg).
 - b. Repeat every 10 min as needed. (BLS should contact medical control)
 - c. Consider Epinephrine infusion per above if needed for severe symptoms.
2. Cardiac Arrest - Asystole, PEA, VF and Pulseless VT:
 - a. 0.5 mg (adult) or 0.01mg/kg (pediatric) 1:10,000 IV/IO every 3 minutes for 3 doses. Please discuss further doses with med control if thought potentially beneficial.
3. Shock/hypotension/unstable bradycardia:
 - a. Infusion: mix 1 mg of 1:10,000 Epinephrine in 100 ml D5W or NS (Concentration: 10 mcg/ml). Administer 0.05-0.2 mcg/kg/ minute then titrate to effect.

- b. Push dose epinephrine: squirt out 1cc of a 10cc NS flush and add 1mg 1:10,000 Epinephrine (1 cc from code epinephrine syringe) into the flush. Roll gently to mix. Administer 10-20mcg (1-2cc) of this 1:100,000 Epinephrine preparation for adults or 0.01 mg/kg 1:10,000 IV/IO push (max 20 mcg) for pediatric. Repeat every 3 – 5 minutes as needed.
 4. Epiglottitis or croup:
 - a. May nebulize 0.5 mg 1:10,000 solution (5ml).
 5. Do not mix with Sodium Bicarbonate or similar alkaline solutions

Adverse Effects

1. Hypertension.
2. Supraventricular tachycardia.
3. Ventricular Dysrhythmias (PVCs, VT, VF)

FENTANYL (SUBLIMIZE)

Pharmacologic Effects

1. Synthetic narcotic analgesic.
2. Ten times more potent than hydromorphone.

Metabolized

1. By the liver.
2. Duration of action: IV/IO: 30-60 minutes, IM: 1-2 hours.

Indications

1. Severe pain.
2. Air hunger in severe shortness of breath.

Contraindications

1. MAO inhibitors.

Cautions

1. Children 2 years old or younger.
2. Altered mental status.
3. Hypotension.

Pregnant patients:

Acceptable

Dosage and Administration

1. 25-100mcg or 1-2 mcg/kg slow IV/IO/IM/MAD (max 100mcg). May repeat up to 200mcg total.
2. Rapid administration may cause muscle rigidity, particularly involving muscles of respiration.

Adverse Effects

1. Sedation.
2. Hallucinations.
3. Respiratory depression.
4. Hypotension.
5. Nausea, vomiting.
6. Bradycardia.

GLUCAGON INJECTION

Pharmacologic Effects

1. A hormone secreted by the alpha cells of the pancreas which causes a breakdown of stored glycogen to glucose.
2. Glucagon is thought to increase heart rate and contractility while decreasing renal vascular resistance.

Metabolized

1. By the liver.

Indications

1. Hypoglycemia when unable to give IV dextrose or oral glucose
2. Beta blocker overdose with unstable or symptomatic bradycardia.

Cautions

1. Severe liver disease
2. Children under age 1 due to possible insufficient hepatic stores of glycogen.
3. Any patient with suspected insufficient hepatic glycogen storage (i.e., malnourished)

Pregnant patients:

Acceptable

Dosage and Administration

1. Reconstitute vials containing 1 mg (1 unit) of powder and a second vial containing 1 ml of diluting solution.
2. Hypoglycemia: 0.5 - 1 mg IV/IO/IM.
3. Beta-blocker overdose: 2 mg IV/IO/IM.
4. Pediatric: 0.03 mg/kg (max 0.5mg). Rarely used in pediatric patients below 1 year of age.

Adverse Effects

1. Nausea and vomiting.

HYDROMORPHONE (DILAUDID) INJECTION

Pharmacologic Effects

1. Narcotic analgesic.

Metabolized

1. Hepatic

Indications

1. Severe pain, i.e., myocardial infarction, trauma.
2. Air hunger in severe shortness of breath.

Cautions

1. Respiratory depression.
2. Elderly patients (due to slower metabolism).
3. Hypotension (Absorption unpredictable).
4. Decreased level of consciousness.

Pregnant patients:

Acceptable

Dosage and Administration

1. 0.5 - 1 mg IV/IO, infused slowly (Pediatric: 0.01 - 0.02 mg/kg). Repeat in 10-15 min as needed.
2. 1-2 mg may be given IM.

Adverse Effects

1. Respiratory depression.
2. Hypotension.
3. Drowsiness/lethargy.

HYPERTONIC SALINE (SODIUM CHLORIDE SOLUTION 3% IN WATER)

Pharmacologic Effects

1. Draws fluid from intracellular and extracellular spaces into vascular space.
2. Increases serum Na⁺.

Metabolized

1. Excreted by the kidneys.

Indications

1. Head injury with signs of increasing ICP.

Pregnant patients:

Acceptable

Dosage and Administration

1. 250 cc bolus IV/IO

Adverse Effects

1. Possible volume overload.
2. Hypernatremia

KETAMINE HYDROCHLORIDE INJECTION (KETALAR)

Pharmacologic Effects

1. Class III Phencyclidine (PCP) derivative that produces a “dissociative” anesthesia with minimal to no respiratory depression.
2. Some bronchodilator effects.

Metabolized

1. Hepatic.

Indications

1. Non-narcotic pain management.
2. Excited Delirium and other behavioral emergencies
3. Induction agent for intubation.
4. Anxiolytic/sedative for severe asthma patients.
5. Sedation for emergent procedure.

Contraindications

1. Angina
2. Suspected CVA
3. History of CAD/CHF
4. Symptomatic hyperthyroidism

Cautions

1. Hypertension
2. Tachycardia
3. Aneurysm
4. Psychotic Disorders

Pregnant patients:

Acceptable. Consider using lower doses given lower plasma clearance.

Dosage and Administration

1. Pain Management
 - a. IV/IO 0.2 mg/kg over 1 minute (max 25 mg)
 - b. IM 0.4 mg/kg
 - c. MAD 1-2 mg/kg
2. Sedation/Procedures/Intubation
 - a. IV/IO 1-2 mg/kg over 1 minute. IM 2-4 mg/kg.
3. Excited Delirium (8 years of age or older)
 - a. IM 4mg/kg (depending on volume, may need to split between 2 different sites of administration)
 - b. IV/IO 2 mg/kg
4. Repeat dose x1 as needed after 5-15 minutes for IV/IO and 10-20 min for IM/MAD. Contact medical control for further doses.

Adverse Effects

1. Hypersecretions
2. Emergence reaction as patient is awakening. Consider Midazolam as needed.
3. May cause rebound pulmonary edema in CHF.

LIDOCAINE HYDROCHLORIDE INJECTION (XYLOCAINE)

Pharmacologic Effects

1. Class Ib antiarrhythmic works by blocking sodium channel.
2. As a local anesthetic blocks neuro transmission to CNS.

Metabolized

1. Rapidly metabolized in the liver 90%.
2. Excreted by the kidneys

Indications

1. Ventricular Cardiac Dysrhythmias
2. Pain with IO infusion

Pregnant patients:

Acceptable

Contraindications

1. Second degree heart block type II.
2. Third degree heart block.

Dosage and Administration

1. Cardiac arrest (VT/VF): IV/IO bolus: 1 - 1.5 mg/kg IV/IO push, followed by repeat doses of 0.5 to 0.75 mg/kg to maximum of 3 doses or 3 mg/kg.
2. Pediatric: 1 mg/kg for all uses unless otherwise specified.
3. Malignant ventricular rhythms (non-cardiac arrest): IV/IO bolus 1 – 1.5 mg/kg over 1 -2 minutes. Consider repeating the initial bolus at 1 mg/kg 20 minutes later.
4. Tricyclic OD: IV/IO bolus 1 – 1.5 mg/kg over 1 -2 minutes. Consider repeating the initial bolus at 1 mg/kg 20 minutes later.
5. Pain relief from IO infusion: prior to a fluid challenge, inject Lidocaine 40 mg, followed by 10 cc saline, and then Lidocaine 20 mg for pain in a conscious patient. Pediatric: 0.5 mg/kg.

Adverse Effects

1. Cardiac dysrhythmias
2. Methemoglobinemia
3. Seizures
4. Malignant Hyperthermia

MAGNESIUM SULFATE INJECTION

Pharmacologic Effects

1. An electrolyte necessary for normal function of the nervous and cardiovascular systems.

Metabolized

1. 50% is deposited in bone, 45% is an intracellular cation, and 5% is in the extracellular fluid.
2. Excreted by the kidneys

Indications

1. Eclampsia
2. Cardiac dysrhythmias:
 - a. Torsades de Pointe (drug of choice).
 - b. Ventricular fibrillation.
 - c. Ventricular tachycardia.
3. Digoxin toxicity (i.e.; second and third degree heart block).
4. Tricyclic overdose with cardiac dysrhythmias resistant to Sodium Bicarbonate
5. Known or suspected hypomagnesemia.
6. Refractory Asthma

Contraindications

1. Third degree or Type II Second degree heart block (except in Digoxin toxicity).

Cautions

1. Renal disease

Dosage and Administration

1. Administer as slow IV/IO push over 15-20 minutes. If no contraindication for IV fluid bolus, may add to 1L IV fluids and administer as drip.
2. Cardiac dysrhythmias, digitalis toxicity, and hypomagnesemia: 1-2g IV/IO; Pediatric: 25-50 mg/kg IV/IO (max 2g).
3. Eclampsia: 6g IV/IO or 5g IM into each buttock (10g total), then start 2g/hr IV drip.
4. TCA overdose 1-2 g IV/IO.
5. Refractory Asthma 2g IV/IO (peds 25-50 mg/kg, max 2g).
6. Reduce dosing if known renal impairment (call Med Control for dosing).

Adverse Effects

1. Respiratory depression and CNS depression.
2. Hypotension with fast infusion.
3. Hypermagnesemia (rare) resulting in muscle weakness and ECG changes (increased PR, QRS, and QT interval).
4. Nausea and diarrhea.

MIDAZOLAM INJECTION (VERSED)

Pharmacologic Effects

1. Short-acting benzodiazepine

Metabolized

1. In the liver.
2. Onset of action is 1–5 minutes for IV/IO injection, 10-15 min for IM injection
3. Elimination half-life is 2-5 hours.

Indications

1. Seizures.
2. Sedation for induction of intubation, post-intubation, and for painful procedures
3. Control of severely agitated/anxious patients.

Contraindications

1. Hypersensitivity to benzodiazepines.

Caution

1. Decreased level of consciousness.

Pregnant patients:

Contraindicated. Discuss with Med Control if you feel that it is needed.

Dosage and Administration

1. Seizures: 4mg IV/IO q5 min PRN ongoing seizures or 10mg IM once (Pediatric 0.2mg/kg IV/IM/MAD, max 4mg for IV, max 10mg for IM/MAD)
2. Induction for intubation: 5-10mg IV/IO; Pediatric 0.1mg/kg IV/IM, 0.2mg/kg MAD (max 5mg)
3. Procedural sedation: 0.3mg/kg q 5 min PRN (max 5mg); Pediatric 0.05-0.1mg/kg IV, 0.1mg/kg IM, 0.2mg/kg MAD (max 5mg)
4. Anxiolysis: Adult 1-2mg IV, 2-4mg IM, 0.1mg/kg MAD (max dose 5mg)

Adverse Effects

1. Respiratory depression.
2. Phlebitis.

NALOXONE HYDROCHLORIDE INJECTION (NARCAN)

Pharmacologic Effect

1. Narcotic antagonist that competes with narcotic agents at opiate receptor sites.

Metabolized

1. By the liver.

Indications

1. Suspected/possible opiate overdose in patients with reduced level of consciousness and respiratory depression.

Pregnant patients:

Acceptable

Dosage and Administration

1. Inject 0.4 - 4 mg IV, IM, IO, or MAD. Pediatric: 0.1 mg/kg (max 4mg).
 - a. Dose may be repeated every 2 - 3 minutes, titrating to respiratory rate >6.
 - b. Use 4mg initial dose in cardiac arrest.
 - c. Repeat or higher doses may be needed in patients on suboxone and fentanyl.
 - d. Use smaller doses in patients with chronic opioid use.
2. Patients may become violent or agitated after administration. Be prepared to restrain patients if needed.

Adverse Effects

1. Withdrawal symptoms (Sweating, tremor, nausea, vomiting, agitation, anxiety)

COMMUNITY PARAMEDIC MEDICATION

NALTREXONE EXTENDED-RELEASE INJECTABLE SUSPENSION (VIVITROL)

Pharmacologic Effects

1. Opiate antagonist.
2. Also used to treat alcohol dependence.

Metabolized

1. Metabolized in the liver.
2. Half-life is 5-10 days.

Indications

Must be prescribed by the patient's PCP for

1. Alcohol Dependence.
2. Opioid Dependence.

Contraindications

1. Opioid use within the last 7 days.
2. Pregnant or breastfeeding.

Cautions

1. Suicidal ideation.
2. Known liver disease

Dosage and Administration

1. Must be reconstituted and warmed to room temperature before administration.
2. Supplied in vials containing 380 mg of powder and a second vial containing 3.4 ml of diluting solution. Reconstituted the volume is 4.2 ml.
3. 380 mg gluteal IM injection monthly (alternating glute each month).

Adverse Effects

4. Opioid withdrawal.
5. Opioid overdose.
6. Injection site reaction.
7. Liver failure and hepatitis

NITROGLYCERIN TABLETS, SUBLINGUAL/NITROGLYCERIN SPRAY, PRE-METERED DOSE

Pharmacologic Effects

1. Vasodilator
2. Decreases blood pressure and afterload

Metabolized

1. By the liver.

Indications

1. Angina and/or anginal equivalents in patients with suspected AMI.
2. Congestive heart failure exacerbation.
3. Hypertensive urgency.

Contraindications

1. Hypotension (SBP <100 mm/Hg).
2. Patients taking erectile dysfunction medication (i.e., Sildenafil, Tadalafil, Avanafil, Vardenafil).
3. Patients on other systemic vasodilators (i.e., isosorbide mononitrate or dinitrate).
4. Suspected aortic dissection or intracranial hemorrhage

Cautions

1. Suspected inferior wall MI. IV should be in place and NS bolus prepared before NTG administration.
2. Glaucoma.

Pregnant patients:

Acceptable

Dosage and Administration

1. Administer 0.4 mg spray or sub-lingual tab (if patient's own med) every 3 - 5 minutes until resolution of angina or equivalent symptom up to 3 doses
2. Administer 0.4 mg spray every 3-5 min until SBP < 180 or no more than a 25% decrease from initial SBP in case of hypertensive emergency or improvement in shortness of breath (as long as SBP > 90) in case of congestive heart failure exacerbation.
3. Call Medical Control to discuss administration in children

Adverse Effects

1. Headache.
2. Skin flushing.
3. Hypotension

NITROUS OXIDE (NITRONOX)

Pharmacologic Effects

1. A blended mixture of 50% nitrous oxide and 50% oxygen.
2. Potent analgesic

Metabolized

1. Excreted by the lungs within 2 - 5 minutes.

Indications

2. Chest pain secondary to suspected MI
3. Trauma patients with fractures, burns, etc.
4. Kidney stones.
5. Any other patient in pain not presenting with a contraindication.

Contraindications

1. Decreased level of consciousness
2. Traumatic chest injuries with possible pneumothorax.
3. Serious facial injuries where a good seal cannot be obtained.
4. COPD
5. Suspected bowel obstruction or perforation

Pregnant patients:

Acceptable

Dosage and Administration

1. Patient should self-administer NO until the patient drops the regulator or the pain is significantly relieved.
2. Keep the tank upright during use due to the possibility of liquid NO escaping.

Adverse Effects

1. Nausea/vomiting.
2. Bizarre behavior.
3. Numbness of the lips and/or ringing in the ears.

NOREPINEPHRINE (LEVOPHED)

Pharmacologic Effects

1. Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction and increasing systemic blood pressure.
2. Stimulates beta receptors, increasing heart rate and contractility and causing mild bronchodilation.

Metabolized

1. Metabolized in the liver

Indications

1. SBP<90 or MAP<65 due to cardiogenic, septic, or neurogenic shock.

Pregnant patients:

Acceptable

Dosage and Administration

1. Administer up to 30cc/kg or 2L of IV fluids prior to starting, unless contraindicated (i.e., pulmonary edema, dialysis patient)
2. Only administer into large proximal veins (antecubital preferred) to decrease the risk of overlying skin necrosis or administer IO.
3. Mix 4 mg in D5W 250 ml, for a concentration of 16 mcg/ml. Administer through microdrip adset (60 gtt/ml).
4. Infuse at 8 mcg/minute, titrate up to 16 mcg/min to maintain systolic BP \geq 90 or MAP>65.
5. Pediatric: 2-12 mcg/minute, titrated to systolic BP >90. (Discuss with Med Control prior to use)
6. If local extravasation occurs, stop administration and notify the receiving physician.

Adverse Effects

1. Tissue necrosis following extravasation.
2. Headache.
3. Tachycardia.
4. Chest pain.
5. Hypertension.
6. Reflex bradycardia from increased BP.

NORMAL SALINE IV FLUIDS

Pharmacologic Effects

1. Grossly isotonic fluid to supplement intravascular volume.
2. Dissociates into sodium and chloride to increase plasma concentration of those ions.

Metabolized

1. Additional volume and salt will be excreted by the kidneys.

Indications

1. Sepsis
2. Hypotension
3. Hypovolemia due to dehydration, bleeding, etc.

Cautions:

1. Dialysis-dependent patient
2. CHF or suspected pulmonary edema

Pregnant patients:

Acceptable

Dosage and Administration

1. Administer up to 2L IV before considering vasopressors except in trauma, in which case, limit to 1L.

Adverse Effects

1. Volume overload

ONDANSETRON INJECTION, SUBLINGUAL TABLETS (ZOFTRAN)

Pharmacologic Effects

1. Anti-emetic.
2. Serotonin antagonist.

Metabolized

1. Metabolized in the liver.
2. Onset in 3 - 10 minutes following IV/IO injection (longer IM/PO). Full effect may not be apparent for 20 minutes, duration of action is 2 - 4 hours (dose dependent).

Indications

1. Severe nausea and/or vomiting.

Cautions

1. Known long QT interval

Pregnant patients

Has been associated with renal agenesis, cleft palate and cardiac anomalies when administered during 1st trimester. Only give if discussed with Med Control or patient has been prescribed this medication during pregnancy.

Dosage and Administration

1. Adult: 4-8 mg IV/IO (slow push) q10 min, PO or IM once (max dose 12 mg)
2. Pediatric: 0.05 - 0.1 mg/kg IV/IO (slow), PO or IM (max dose 12 mg)

Adverse Effects

1. Rare side effects may include:
 - a. Blurred vision.
 - b. Dizziness.
 - c. Headache.

OXYMETAZOLINE (AFRIN)

Pharmacologic Effects

1. An alpha-adrenergic agonist used as a nasal decongestant and vasoconstrictor.

Metabolized

1. By the liver

Indications

1. May be used to assist in controlling epistaxis in conjunction with direct nasal pressure.

Contraindications

1. SBP>185 or DBP>110

Cautions

1. History of significant cardiovascular disease.

Pregnant patients:

Avoid use

Dosage and Administration

1. After blowing nose to clear clots, administer 1-2 sprays into affected nostril
2. Apply direct pressure to nares under the bridge of the nose

Adverse Effects

1. Hypertension
2. Tachycardia

COMMUNITY PARAMEDIC MEDICATION

PALIPERIDONE PALMITATE EXTENDED-RELEASE INJECTABLE SUSPENSION

(INVEGA SUSTENNA AND INVEGA TRINZA)

Pharmacologic Effects

1. Dopamine antagonist.
2. Serotonin antagonist.

Metabolized

1. Metabolized in the liver.

Indications

Must be prescribed by the patient's PCP for

1. Schizoaffective disorder.
2. Schizophrenia.

Contraindications

1. Hypersensitivity to Risperidone.
2. Prolonged QTc syndrome.
3. Dysrhythmia history
4. Dementia.

Cautions

1. Bradycardia.
2. QT prolongation.
3. Hypovolemia.
4. Seizure history (relative)
5. High environmental temperature.
6. Patients over 65 years of age

Dosage and Administration

1. Ideally should have been started by PMD
2. Continue to monitor for suicidal ideation in patients with history
3. IM Injection in deltoid or glute.
4. Invega Sustenna is Monthly prescribed at the following doses: 39 mg, 78 mg, 117 mg, 156 mg, or 234 mg.
5. Invega Trinza is Every 3 Months following \geq 4 months of adequate treatment with Invega Sustenna. Invega Trinza is prescribed at the following doses: 273 mg, 410 mg, 546 mg, 819 mg, 234 mg.
6. Consult with PMD on dosing for patients with renal impairment

Adverse Effects

1. Injection site reaction.
2. QT prolongation.
3. Dystonia.
4. CNS depression
5. Risk of CVA
6. Hyperglycemia
7. Dyslipidemia
8. Weight gain
9. Esophageal dysmotility and aspiration risk
10. Orthostatic hypotension and fall risk
11. Extrapyrimal symptoms and syncope

PREDNISONE

Pharmacologic Effects

1. Synthetic glucocorticoid (corticosteroid).
2. Anti-inflammatory.

Metabolized

1. By the liver, to prednisolone.

Indications

1. Asthma and reactive airway disease.
2. Allergic reactions.

Contraindications

1. No absolute contraindication for life-threatening illness.

Cautions:

1. Nausea and vomiting.

Pregnant patients:

Acceptable

Dosage and Administration

1. Adult: 1-2 mg/kg orally (max 60mg).
2. Pediatric: 1-2 mg/kg orally (max 40 mg).

Adverse Effects

1. GI upset

PROPARACAINE 0.5% OPHTHALMIC SOLUTION (ALCAINE)

Pharmacologic Effects

1. Topical anesthetic.

Metabolized

2. Locally.
3. By the liver.

Indications

1. Short term relief of pain in non-penetrating eye trauma (e.g., corneal scratches).

Contraindications

1. Suspected perforation of the globe.

Pregnant patients:

Acceptable

Dosage and Administration

1. 1 - 2 drops into the affected eye.

Adverse Effects

1. Erythema and conjunctival swelling.

ROCURONIUM BROMIDE INJECTION (ZEMURON)

Pharmacologic Effects

1. Non-depolarizing neuromuscular blocking agent. Rocuronium competes with acetylcholine for receptor sites at the motor end plate causing muscular paralysis.

Metabolized

2. In the liver and excreted by the kidneys.
3. Onset of action in 60 to 90 seconds depending on dose and age of patient.
4. Muscular paralysis typically lasts between 20 to 60 minutes.

Indications

1. Paralytic for intubation.

Cautions

2. Significant liver disease.
3. Pulmonary hypertension – may increase pulmonary vascular resistance.
4. Valvular heart disease – may increase pulmonary vascular resistance and worsen symptoms of right heart failure.

Pregnant patients:

Acceptable

Dosage and Administration

1. 1 mg/kg IV/IO.
2. Patients must be pre-medicated with sufficient dose of a sedative as Rocuronium has no effect on patient's level of consciousness. Due to extended paralysis, appropriate sedation of patient should be maintained by administering Midazolam 1 - 4 mg or Ketamine 0.5 - 2 mg/kg every 5 - 10 minutes.

Adverse Effects

1. Hypertension and tachycardia.
2. Transient hypotension.

SODIUM BICARBONATE INJECTION

Pharmacologic Effects

1. Alkalinizing agent.
2. Increases potassium influx into cells.

Metabolized

1. Bicarbonate is excreted in the urine and by the lungs as CO₂.
2. Na is excreted in the urine.

Indications

1. Hyperkalemia potentially indicated by peaked T waves or wide complex rhythm.
2. Aspirin overdose.
3. Tricyclic antidepressant overdose.
4. Metabolic acidosis in cardiac arrest.

Contraindications

1. Metabolic alkalosis.
2. Hypokalemia.
3. Hypocalcemia.

Cautions

1. Pulmonary edema

Pregnant patients:

Acceptable

Dosage and Administration

2. Do not administer in same line with Calcium Chloride (forms a solid).
3. Observe carefully to avoid extravasation (may cause tissue necrosis).
4. Hyperkalemia: 50 mEq IV/IO bolus, followed by 50 mEq in 100cc D5W over 10 minutes.
5. Aspirin /Tricyclic overdose: 2 amps (100 mEq or 1.5 mEq/kg) IV/IO slow push over 5 minutes, then 1 amp of Sodium Bicarbonate in NS over 30 minutes (Pediatric: 1 - 2 mEq/kg and if the patient is < 1 year dilute 1:1 with NS).
6. Metabolic Acidosis in Cardiac arrest: 1 mEq/kg IV/IO slow push.

Adverse Effects

1. Shortness of breath in patients with respiratory disease.

SUPPLEMENTAL OXYGEN

Pharmacologic Effects

1. Oxygen is a life-sustaining element, essential to cellular respiration.
2. Excess oxygen can form damaging free radicals.

Metabolized

1. Metabolized during cellular respiration.

Indications

1. Hypoxemia.
2. Manual or mechanical ventilatory management.

Cautions

1. COPD. Oxygenation above the patient's baseline may contribute to worsening respiratory status and respiratory arrest.

Pregnant patients:

Acceptable

Dosage and Administration

1. Apply as needed to titrate saturations to 92-95% (88-92% if history of COPD)
2. CO Poisoning: SpO₂ will be falsely elevated. Administer 15L O₂ by NRB or direct ventilatory support.
3. Pre-intubation oxygenation: Administer 15L O₂ by NRB for at least 3 min.

Adverse Effects

1. Formation of free radicals, causing increased mortality in some conditions.
2. Respiratory failure in COPD patients.

TRANEXAMIC ACID (TXA)

Pharmacologic Effects

1. A lysine analog that binds plasminogen to competitively inhibit activation, delaying the physiologic breakdown of platelet aggregation.
2. TXA is ineffective or harmful if administered greater than 3 hours after injury, after full activation of endogenous fibrinolysis begins.
3. May reduce systemic inflammatory response over subsequent 24 - 48 hours.

Metabolized

1. 2-hour half-life.
2. 95% excreted unchanged in urine.

Indications

1. Blunt or penetrating trauma with evidence of severe bleeding and signs of poor tissue perfusion or failing vital signs.
2. Administer as soon after injury as possible.

Contraindications

1. Injury > 3 hours old.

Pregnant patients:

Acceptable

Dosage and Administration

1. 1 g slow IV/IO over 10-20 min. Pediatric: 10mg/kg slow IV/IO.
2. Rapid administration may contribute to hypotension.

Adverse Effects

1. May rarely contribute to coagulopathies.