# Pitt County

# 2012

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# EMS Medical Director Requirements

## I. Qualifications for a Medical Director of an EMS System

### A. The medical director of an EMS system will:

1) Hold a current license to practice medicine or osteopathy in North Carolina.
2) Have endorsement indicating a working relationship with the local physician community (i.e. Hospital staff, local medical society, or emergency physicians group).
3) Preferably hold board certification or be board prepared in Emergency Medicine and completion of an EMS Fellowship. When this is not feasible, the medical director must at least hold board certification or be board prepared in a clinical specialty that represents the broad patient base the EMS System serves. Board certification must be obtained within 5 years after successful completion of residency training.
4) Maintain BC/BP as mentioned in A-3 above with a board, approved by the American Board of Medical Specialties or the American Osteopathic Association.
5) Maintain an active clinical practice.
6) Have education or experience in out-of-hospital emergency care.
7) Have participated, or possess equivalent experience, in the resuscitation of adult and pediatric patients that suffer acute illness or traumatic injury.
8) Possess knowledge of federal, state, and local laws and regulations regarding EMS
9) Maintain appropriate medical liability coverage.
10) Maintain involvement in local, regional, state, or national EMS organizations.
11) Be exempt from item A-3 above if the medical director was appointed prior to January 1, 2002. Those directors who do not meet the qualifications in item A-3 must maintain current certification in a standardized adult trauma resuscitation course, a standardized adult cardiac resuscitation course, and a standardized pediatric acute resuscitation course.
12) Attend quarterly EMS System Performance Improvement Committee (previously know as the Peer Review Committee) meetings. Serve as chair of that committee, unless the Assistant EMS Medical Director is appointed as chair.
13) Strongly recommended that the EMS Medical Director actively participate in prehospital care by providing onsite medical direction during ride alongs with EMS (8 hours per year or an equivalent of 4 scene responses per year. This would exclude scene responses in their own office/practice. For medical directors with multiple counties only 8 hours of total ride time, or 4 scene responses total would be expected. Ride time is required by the EMS Medical Director for any agency performing Rapid Sequence Intubation in the field. This is based on the developing national standards that may make this a requirement in the future.

### B. Requirements that must be maintained.

1) Completion of the North Carolina College of Emergency Physician's Medical Director's Course or the NAEMSP Medical Directors Course within the first year of appointment, beginning in 2012. For those who obtain reciprocity through the NAEMSP course or have completed a similar course from another state, they would be required to obtain a North Carolina specific class whenever it becomes available.
2) In subsequent years, attend 1 North Carolina EMS Medical Director meeting scheduled by the NC OEMS annually.
3) Strongly recommended that those Medical Directors credentialed before 2012 attend an EMS Medical Directors course update/refresher whenever it becomes available.
4) Maintain records of compliance with education and training requirements above and produce same upon request by local EMS and/or NC Office of EMS.

## II. Qualifications for a Medical Director of an EMS Specialty Care Transport Program

### A. The medical director of an EMS Specialty Care Transport Program will:

1) Maintain all requirements listed in Section I of this document.
2) Maintain an active presence and level of participation in an EMS practice setting with credentialed EMS personnel.
3) Maintain significant activity with state and regional initiatives, such as attending state/regional EMS conferences, participation in the NCCEP EMS Committee, or equivalent.
4) Possess knowledge of federal, state, and local laws and regulations regarding EMS specialty care transport programs.
5) Maintain involvement in local, regional, state, or national specialty care transport programs.
6) Maintain a knowledge and understanding of aircraft capabilities, safety issues, weather minimums, and FAA rules if providing medical direction for an air medical service.
7) Maintain a knowledge and understanding of the effects and stresses of altitude on the patient, crew, and equipment if providing medical direction for an air medical service.
8) Assist local EMS agencies in disaster planning and appropriate use of specialty care transport services.

## III. Qualifications for an EMS Education Medical Advisor

### A. The educational medical advisor will:

1) Maintain all requirements listed in Section I of this document.
2) Possess familiarity with the design and operation of EMS systems.
3) Have experience in EMS education and methodology.
4) Maintain dialogue with medical directors regarding protocols and other educational concerns.

## IV. Qualifications for EMS Assistant Medical Director

### A. The EMS Assistant Medical Director will:

1) Hold a current license to practice medicine or osteopathy, or be credentialed by the North Carolina Office of EMS as an EMS Physician Assistant or EMS Nurse Practitioner.
2) Work under the direction of the EMS system medical director or the EMS specialty care transport program medical director.
3) Maintain all requirements listed in Section IB of this document.
4) Serve as chair of the EMS System Performance Improvement Committee meetings if appointed by system medical director.

## VI. Grounds for termination

Any medical director, assistant medical director, or educational medical advisor may be terminated if the requirements in this document are not fulfilled and maintained.

# Standards for EMS Equipment**

**B.** The baseline equipment required in all systems (including Specialty Care Transport Programs) with EMS personnel credentialed at the specified level.

**S.** The equipment required in all Specialty Care Transport Programs (in addition to the baseline equipment required in all EMS Systems). All Air Medical Specialty Care Transport Programs and dedicated Neonatal Transport Programs are required to carry and maintain equipment and medications specific to each mission, as defined by medical control and OEMS approved protocols.

**O.** The equipment, which is optional for any system with EMS personnel, credentialed at the specified level.

| EMS Equipment | Conv. | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| **Ventilation and Airway Equipment** | | | | |
| Bag Valve Mask (adult and child size bag with Adult/Child/Infant/Neonatal masks) | B | B | B | B |
| Bulb Syringe | O | B | B | B |
| Blind Insertion Airway Device (BIAD) with 2 sizes (one adult and one pediatric) | | B | B | B[1] |
| Cricothyroidotomy (Surgical) equipment | | | | B[1] |
| Endotracheal tubes (ETT)(3 adult and 3 pediatric sizes) | | | B | B |
| Capnometry (Color) ETCO2 detectors | | B[2] | B[2] | B[2] |
| Laryngoscope blades (3 adult and 3 pediatric sizes) | | | B | B |
| Laryngoscope handle with extra batteries, and extra light source (bulbs or handle if using fiberoptic) | | | B | B |
| McGill forceps or equivalent with 2 sizes (one adult and one pediatric) | | | B | B |
| Meconium Aspirator adaptor | | | B | B |
| Nasal cannula for Oxygen Delivery with 2 sizes (one adult and one pediatric) | B | B | B | B |
| Nasopharyngeal airways (3 adult and 3 pediatric sizes) | B | B | B | B |
| Nebulizer | | O[1] | B | B |
| Needle 3 inches or longer and 14ga or larger for Chest Decompression | | | | B |
| Oropharyngeal airways (3 adult and 3 pediatric sizes) | B | B | B | B |
| Oxygen Mask (Non-Rebreathing) in 2 sizes (one adult and one pediatric) | B | B | B | B |
| Oxygen with variable flow regulator (Portable and Fixed) | B | B | B | B |
| Rigid pharyngeal suction device | B | B | B | B |
| Stylettes for Adult and Pediatric Endotracheal tube size | | | B | B |
| Suction apparatus (Portable and Fixed) | B | B | B | B |
| Suction catheters (one between 6 and 10F size, one between 12 and 16F size) | O | B | B | B |
| Syringe in 10ml size (non-luerlock) | | B | B | B |
| Ventilator (Pressure or Volume based with PEEP)* | | | | S, O |
| Wide-bore suction tubing | B | B | B | B |
| **Monitoring and Defibrillation** | | | | |
| Automatic External Defibrillator with 2 pad sizes (one adult and one pediatric) | B | B | B | |
| Capnography (ETCO2) monitoring, continuous | | B[4] | B[4] | B[4] |
| Glucose Measuring Device | | B | B | B |
| Pacemaker- External | | | | B |
| Pacemaker-Transvenous | | | | S |
| Monitor with 12 lead EKG | | B[3] | B[3] | B |
| Monitor/defibrillator with electrodes and 2 sizes of pads or paddles | | | | B |
| Pulse oximeter with 2 probe sizes (one adult and one pediatric) | O | B | B | B |

# Standards for EMS Equipment

| | | | | |
|---|---|---|---|---|
| **Immobilization Devices** | | | | |
| Cervical spine immobilization device in at least 3 sizes (small, medium, and large) | O | B | B | B, S[1] |
| CPR Board | B | | | |
| Femur traction device in at least 2 sizes (one adult and one pediatric) | O | B | B | B, S[1] |
| Head immobilization device | O | B | B | B, S[1] |
| Backboards, short and long with appropriate restraints (minimum of 3 straps) | O | B[5] | B[5] | B[5], S[1] |
| Spinal immobilization and extrication device (one adult and one pediatric) | O | B | B | B, S[1] |
| Upper and Lower extremity immobilization devices | O | B | B | B, S[1] |
| **Bandages** | | | | |
| Burn sheet | O | B | B | B |
| Cold packs | O | B | B | B |
| Dressings, bandages, gauze rolls, adhesive tape and 2 triangular bandages | B | B | B | B |
| Heavy scissors for clothing removal | B | B | B | B |
| Occlusive dressing | O | B | B | B |
| Sterile saline solution for irrigation (may use IV solution) | O | B | B | B |
| **Medication Administration** | | | | |
| Alcohol wipes | O | B | B | B |
| Intraosseous needles in at least 2 sizes (one adult and one pediatric) | | | | B |
| IV administration sets | | | B | B |
| IV arm boards | | | B | B |
| IV catheters in at least 4 sizes | | | B | B |
| IV pole/hook | O | O | B | B |
| Needles in various sizes (at least 1 must be 1.5 in. for IM injections) | | | B | B |
| Syringes in at least 3 sizes | | | B | B |
| Tourniquet | | B | B | B |
| **Obstetrical** | | | | |
| Sterile OB kit, scissors, bulb suction, cord clamps | O | B | B | B |
| **Miscellaneous** | | | | |
| Bedpan and urinal | B | B[5] | B[5] | B[5] |
| Length/weight based pediatric tape | B | B | B | B |
| Cellular phone | O | B | B | B |
| Emesis basins | B | B | B | B |
| Lubricating jelly | B | B | B | B |
| Gastric tubes (adult and pediatric sizes) | | | | S, O |
| Sheets, pillows, pillow cases, and towels | B | B[5] | B[5] | B[5] |
| Sphygmomanometer (cuffs and device) with at least 3 sizes (pediatric, normal adult, and large adult) | B | B | B | B |
| Stair chair/folding stretcher | O | B[5] | B[5] | B[5], S[1] |
| Stethoscope | B | B | B | B |
| Thermometer with low temperature capability | O | B | B | B |
| Triage tags | O | B | B | B, S[1] |
| Wheeled cot with security for patient transport | B | B[5] | B[5] | B[5], S[1] |
| **Injury Prevention Equipment** | | | | |
| Thermal blanket or other heat conserving device | B | B | B | B |
| **Infection Control** | | | | |
| Disinfectant hand wash | B | B | B | B |
| Disinfectant solution for cleaning equipment | B | B | B | B |

| | | | | |
|---|---|---|---|---|
| **Disposable biohazard trash bags** | B | B | B | B |
| **Eye protection** | B | B | B | B |
| **Gloves, non-sterile** | B | B | B | B |
| **N-95 or HEPA Masks** | B | B | B | B |
| **Jumpsuits/gown** | B | B | B | B |
| **Latex Allergy Kit (If not using latex free equipment)****** | B | B | B | B |
| **Latex Free Gloves** | B | B | B | B |
| **Masks** | B | B | B | B |
| **Sharps containers (Fixed and Portable)** | O | B | B | B |
| **Shoe covers** | B | B | B | B |

**Conv. = Convalescent Transport Program, EMT = Emergency Medical Technician, EMT-I = EMT-Intermediate, EMT-P = EMT-Paramedic**

B[1] = Systems performing Drug Assisted Intubation must also have the ability to perform Surgical Cricothyrotomy. Commercial Cricothyrotomy or Tracheostomy kits that create an airway comparable to a surgical Cricothyrotomy are acceptable.

B[2] = All EMT-Basic, EMT-Intermediate and Paramedic Systems must at a minimum use Capnometry (Color) to confirm the placement of every BIAD or intubation. EMT-Paramedic systems performing Drug Assisted Intubation must use Capnography (numeric or waveform) to confirm tube placement. Waveform Capnography is recommended for this requirement.

B[3] = It is not required but highly recommended that all EMS Systems at all levels, except Convalescent, work to have 12 lead ECG capability at the scene of every emergent event.

B[4]= It is not required but highly recommended that all EMS Systems at all levels work to have waveform Capnography capability at the scene of every emergent event.

B[5] = Equipment which is considered optional (not mandatory) to non-transport EMS vehicles.

S[1] = Specialty Care Transport Programs are not required to maintain this equipment on every response, but the equipment must be available on a case by case basis dependent on the patient care scenario.

O[1] = Required for EMT-Basic level agencies administering nebulizer Beta Agonists.

**<u>All Specialty Care Transport Programs which are listed in a counties primary 911 response plan or provide backup 911 primary response service, are required to maintain the same level of skills, medications and equipment which the county system maintains.</u>**

***For the purposes of this document, a "ventilator" is a ventilation device, which attaches to an endotracheal or tracheostomy tube. It is capable of ventilating by a pressure or volume delivery mechanism. It must have adjustments for respiratory rate, volume/pressure settings, and for assisted or full ventilation. It has the capabilities of PEEP or other pressure based manipulations. A "respirator" is any other device that assists with ventilations during a respiratory/cardiac arrest.**

# Standards for EMS Equipment

****All EMS Systems must carry at a minimum the equipment associated with the EMT Level unless functioning as a convalescent transport service.**

****All EMS Systems must carry pediatric and adult when size is important. Items that require pediatric sizes are shaded ORANGE.**

******A Latex Allergy Kit should be composed of all the necessary personal protection equipment and materials necessary to obtain and maintain IV access.**

**B.** The baseline medications and skills required in all systems and Specialty Care Transport Programs) with EMS personnel credentialed at the specified level.

**S.** The equipment required in all Specialty Care Transport Programs. All Air Medical Specialty Care Transport Programs and dedicated Neonatal Transport Programs are required to carry and maintain equipment and medications specific to each mission, as defined by medical control and OEMS approved protocols.

**O.** These medications and skills are optional.

**This medication list is based on the medications which are used in the NCCEP Protocol documents. This list does not include all of the medications which are approved for use by the NC Medical Board. The NC Medical Board Medication and Skills Formulary can be found online at www.NCEMS.org under the OEMS regulations section of the website.**

| EMS Medications | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| Acetaminophen | O | O | B[9] | B |
| Adenosine | | | | B |
| Beta-agonists (Albuterol, Levalbuterol, etc.) | | B[6] | B | B |
| Amiodarone | | | | B[1] |
| Anti-emetic preparations | | | | B |
| Aspirin | | B[6] | B | B |
| Atropine | O[1] | O[1] | O[1] | B |
| Beta Blockers (Metoprolol, etc.) | | | | B[8] |
| Benzodiazepine (Diazepam, Midazolam, etc.) | | | | B[2] |
| Calcium Channel Blockers (Diltiazem, etc) | | | | B[8] |
| Calcium chloride/gluconate | | | | B |
| Charcoal | | O | O | O |
| Crystalloid solutions (Normal Saline, etc) | | | B | B |
| Diphenhydramine | | O[2] | B | B |
| Dobutamine | | | | S, O |
| Dopamine | | | | B |
| Epinephrine | B[5,6] | B[5,6] | B | B |
| Etomidate | | | | O |
| Furosemide | | | | O |
| Glucagon | | | B | B |
| Glucose solutions | | | B | B |
| Haloperidol | | | | O |
| Histamine 2 Blockers (Ranitidine, Cimetidine) | | | O | O |
| Ipratropium | | | O | O |
| Ketamine | | | | O[4] |
| Lidocaine | | | | B[1] |
| Magnesium sulfate | | | | S, O |
| Metoclopromide | | | | O |
| Methylprednisolone | | | | S, O |
| Narcotic analgesic | | | | B |
| Naloxone | | O[2] | B | B |

| EMS Medications | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| Nasal Spray Decongestant | | O[2] | O | O |
| Nitroglycerin | | B[6] | B | B |
| Nitrous Oxide | | | | O |
| Nitroprusside sodium | | | | O |
| Non-steroidal anti-inflammatory | | O[2] | B[9] | B |
| Oxygen | B | B | B | B |
| Oxytocin | | | | S, O |
| Potassium chloride | | | | S, O |
| Pralidoxime | O[1] | O[1] | O[1] | O |
| Prednisone | | | | O |
| Procainamide | | | | S, B[1] |
| Propofol | | | | O[3] |
| Sodium bicarbonate | | | | B |
| Steroid preparation | | | | B |
| Succinylcholine and/or Rocuronium | | | | S, O |
| Vasopressin | | | O | O |
| Vecuronium | | | | O |
| Ziprasidone | | | | O |

| EMS Skills | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| 1.12-Lead Electrocardiogram (ECG) | | B[10] | B[10] | B[10] |
| 2.15-Lead Electrocardiogram (ECG) | | | | O |
| 3.Airway-BIAD-Combitube | | B[12] | B[12] | B[3] |
| 4.Airway-BIAD-King LT | | B[12] | B[12] | B[3] |
| 5.Airway-BIAD-Laryngeal Mask Airway (LMA) | | B[12] | B[12] | B[3] |
| 6.Airway-CPAP | | | O | S, O |
| 7.Airway-Cricothyrotomy-Surgical | | | | B[3] |
| 8.Airway-Endotracheal Tube Introducer | | | O | O |
| 9.Airway-Foreign Body Obstruction | B | B | B | B |
| 10. Airway Intubation Confirmation-End-Tidal $CO_2$ (color) | | B[4] | B[4] | B[4] |
| 11. Airway-Intubation Confirmation-Esophageal Bulb | | O | O | O |
| 12. Airway-Intubation Rapid Sequence Intubation - Adult | | | | O, S |
| 13. Airway-Intubation Rapid Sequence Intubation - Peds | | | | O[5] |
| 14. Airway-Intubation Nasotracheal | | | O | O |
| 15. Airway-Intubation Oral Tracheal | | | B | B |
| 16. Airway-Nebulizer Inhalation Therapy | | O | O | O |
| 17. Airway-Respirator Operation | | | O | O |
| 18. Airway-Suction Advanced | | | B | B |
| 19. Airway-Suction Basic | | B | B | B |
| 20. Airway-Tracheostomy Tube Change | | | | B |
| 21. Airway-Ventilator Operation | | | | S, O |
| 22. Arterial Lines-Blood Draw | | | | S, O |
| 23. Arterial Lines-Maintain | | | | S, O |
| 24. Assessment-Adult | B | B | B | B |
| 25. Assessment-Pain | B | B | B | B |
| 26. Assessment-Pediatric | B | B | B | B |
| 27. Blood Glucose Analysis | B[13] | B[13] | B | B |
| 28. Capnography (waveform) | | B[11] | B[11] | B[11] |
| 29. Carbon Monoxide Measurement – Non-invasive | O | O | O | O |
| 30. Cardiac Pacing | | | | B |
| 31. Cardiopulmonary Resuscitation (CPR) | B | B | B | B |
| 32. Chest Compression – External Device | | | O | O |
| 33. Cardioversion | | | | B |
| 34. Chest Decompression (Needle) | | | | B |
| 35. Chest Tube Maintenance | | | | O |
| 36. Childbirth | | B | B | B |
| 37. CNS Catheter-Epidural Catheter Maintenance | | | | S, O |
| 38. CNS Catheter-Ventricular Catheter Maintenance | | | | S, O |
| 39. Decontamination | B | B | B | B |
| 40. Defibrillation-Automated | B | B | B | O |
| 41. Defibrillation-Manual | | | | B |
| 42. Gastric Tube Insertion | | | | S, O |
| 43. Injections-SQ and IM | | | B | B |
| 44. Orthostatic Blood Pressure | O | O | B | B |
| 45. Pulse Oximetry | B[13] | B[13] | B | B |
| 46. Reperfusion Checklist | B | B | B | B[7] |
| 47. Restraints Physical | | B | B | B |

| | | | | |
|---|---|---|---|---|
| 48. Spinal Immobilization | B | B | B | B |
| 49. Splinting | B | B | B | B |
| 50. Stroke Screen | B | B | B | B[7] |
| 51. Temperature Measurement | O | O | B | B |
| 52. Urinary Catheterization | | | | S, O |
| 53. Venous Access-Blood Draw | | | O | O |
| 54. Venous Access-Central Line Maintenance | | | | S, O |
| 55. Venous Access-Existing catheters | | | | B |
| 56. Venous Access-External Jugular Access | | | B | B |
| 57. Venous Access-Extremity | | | B | B |
| 58. Venous Access-Femoral Line | | | | O[6] |
| 59. Venous Access-Intraosseous | | | | B |
| 60. Venous Access-Swan-Ganz Catheter Maintenance | | | | S, O |
| 61. Wound Care-General | B | B | B | B |
| 62. Wound Care-Hemostatic Agent | B | B | B | B |
| 63. Wound Care-Taser Probe Removal | B | B | B | B |
| 64. Wound Care-Tourniquet | B | B | B | B |

B[1] = All EMT-Paramedic systems must carry some form of anti-arrhythmic agent. This must either be amiodarone, lidocaine, or procainamide.
B[2] = All EMT-Paramedic systems must carry some form of injectable benzodiazepine.
B[3] = All EMT-Paramedic Systems must have an airway backup. This can be a Combitube, Laryngeal Mask Airway (LMA) or Surgical Cricothyrotomy. Systems performing Rapid Sequence Induction must have the ability to perform Surgical Cricothyrotomy. Commercial Cricothyrotomy or Tracheostomy kits that create an airway comparable to a surgical Cricothyrotomy are acceptable.
B[4] = All EMT-Intermediate and Paramedic Systems must use either Capnometry (Color) or waveform Capnography to confirm every intubation and invasive airway. EMT-Paramedic systems performing Rapid Sequence Induction must use waveform Capnography to confirm tube placement.
B[5] = Epinephrine in EMT systems may be used in Anaphylaxis only.
B[6] = All EMT systems may use Epinephrine**,** Albuterol**,** Nitroglycerine, Naloxone, Aspirin, and over the counter medications if they function under medical direction.
B[7] = Stroke Screen and Reperfusion Screens are not required for interfacility transports associated with Neonatal Specialty Care Transport Services.
B[8]= EMT-Paramedic systems must carry either a Calcium Channel Blocker or Beta- Blocker.
B[9]= EMT-Intermediate systems must carry either Acetaminophen or a Non-steroidal anti-inflammatory.
B[10]= It is not required but highly recommended that all EMS Systems at all levels work to have 12 lead ECG capability at the scene of every emergent event.
B[11]= It is not required but highly recommended that all EMS Systems at all levels work to have waveform Capnography capability at the scene of every emergent event.
B[12]= All EMS Systems at all levels must carry some version of a Blind Insertion Airway Device. This may be either the Combitube, King LT, or LMA device. It is recommended that at BIAD with pediatric sizes be used. EMT=Basic Systems must fall under medical direction to use BIADs.
B[13]= Glucose Measuring Devices and Pulse Oximetry must be available to monitor any patient cared for within an EMT-Basic System.

**O**[1] = As a component of preparedness for domestic terrorism, EMS personnel, public safety officers and other first responders recognized by the EMS system, may carry, self-administer, or administer to a patient atropine and/or pralidoxime, based on written protocols and medial direction. All personnel except for EMT-P's must administer theses medication by an auto injector.
**O**[2]= All EMT systems may use Epinephrine**,** Albuterol**,** Nitroglycerine, Naloxone, Aspirin, and over the counter medications if they function under medical direction
**O**[3] = Can only be used for interfacility transport where infusion has already been started at transferring facility. EMS units can not carry propofol unless it is provided by transferring hospital. EMS systems anticipating utilizing propofol must submit to OEMS a policy regarding education of staff on use of propofol and Quality Management surrounding propofol.

**O**[4] = Ketamine may only be used as an inducation agent for RSI or for post intubation sedation.
**O**[5] = Airway-Intubation Rapid Sequence Intubation – Peds is optional only for SCTP. Pediatric RSI is not permitted for patients less than 12 years of age in primary 911 agencies.
**O**[6] = Venous Access-Femoral Line is optional only for SCTP. Femoral lines are not permitted by primary 911 agencies

**All Specialty Care Transport Programs which are listed in a counties primary 911 response plan or provide backup 911 primary response service, are required to maintain the same level of skills, medications and equipment which the county system maintains.**

***For the purposes of this document, a "ventilator" is a ventilation device, which attaches to an endotracheal or tracheostomy tube. It is capable of ventilating by a pressure or volume delivery mechanism. It must have adjustments for respiratory rate, volume/ pressure settings, and for assisted or full ventilation. It has the capabilities of PEEP or other pressure based manipulations. A "respirator" is any other device, which assists with ventilations during a respiratory/cardiac arrest.**

# Emergency Medical Dispatch (EMD)

**EMS dispatch (911) centers who provide telephone triage of EMS services and online medical instructions through Emergency Medical Dispatch (EMD) must meet the following requirements:**

1. The EMD program must have a medical director fulfilling the NCCEP Qualifications for a Medical Director of an EMS system.

2. The EMD program must adopt a policy wherein Law Enforcement is dispatched along with EMS on fatality or unresponsive child pediatric 911 calls. When a qualifying pediatric (0-17 years) call is received by dispatch, law enforcement will be dispatched along with EMS. It will be at the discretion of the responding law enforcement agency to determine if they need to remain involved based on circumstances.

3. Protocols used by the EMD program must conform to either the **National Academy of Emergency Medical Dispatch** or the **Associated Public-Safety Communications Officials International** EMD protocols.

   A. An approved EMD program must use the current published version of the EMD protocols.

   B. A one-year grace period from the release of any new EMD protocol version will be given to each EMD program to adopt the new version and obtain compliance.

   C. All EMD programs must submit all EMD protocols for approval by the North Carolina EMS Medical Director.

   D. The North Carolina EMS Medical Director must approve any change or modification to the EMD protocols described above, other than the configuration of the dispatch determinants.

# 2012 EMS Protocol

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1. Universal Patient Care
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3. Adult, Failed Airway
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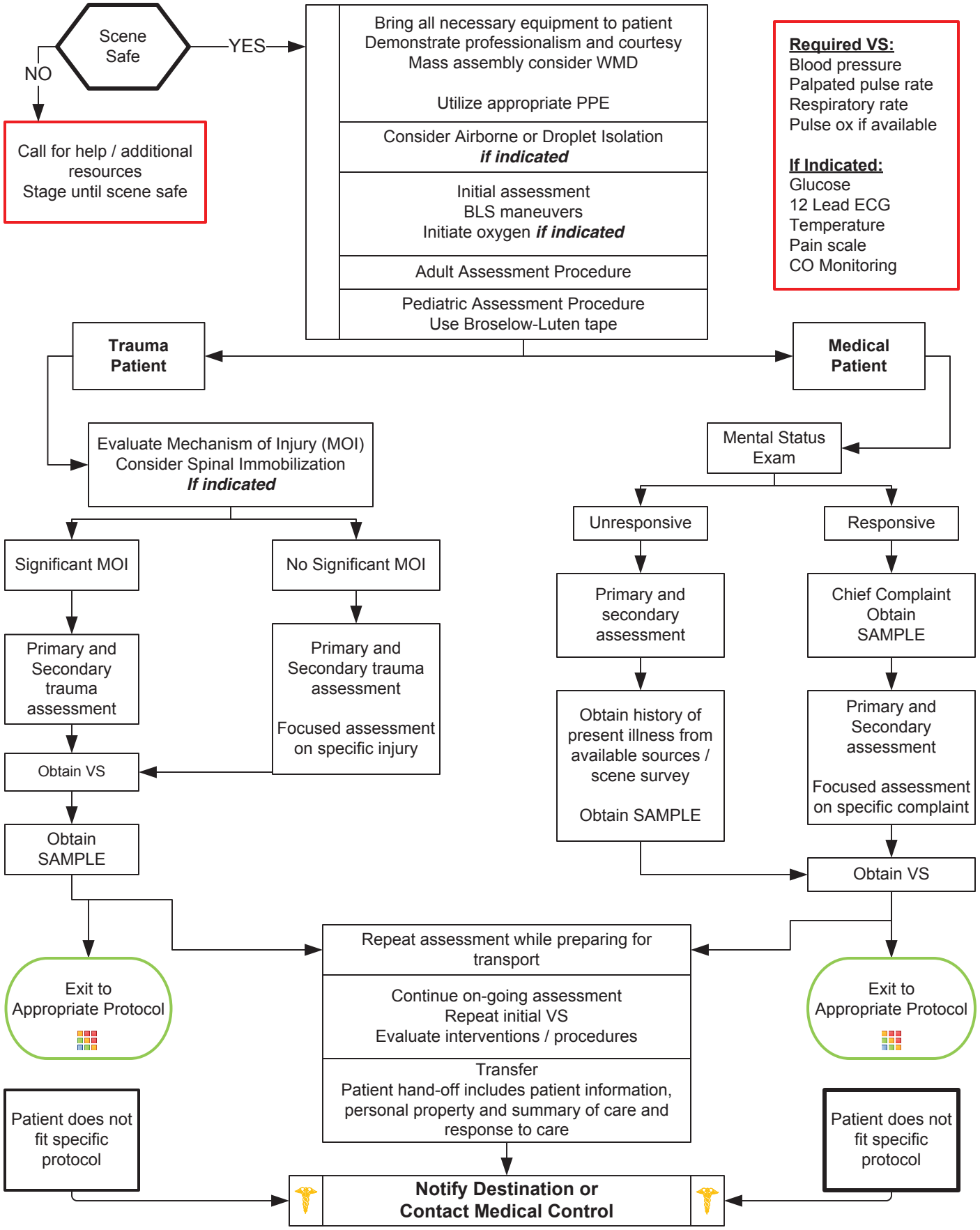
9. Scene Rehabilitation: Responder
10. None
11. Adult Asystole / PEA
12. Bradycardia; Pulse present
13. Cardiac Arrest; Adult
14. Chest Pain: Cardiac and STEMI
15. CHF / Pulmonary Edema
16. Adult Tachycardia – Narrow Complex =<0.11 sec
17. Adult Tachycardia – Wide Complex =>0.12 sec
18. Ventricular Fibrillation & Pulse less Ventricular Tachycardia
19. Post Resuscitation
20. Induced Hypothermia
21. Teamed Focused CPR
22. None
23. Abdominal Pain
24. Allergic Reaction / Anaphylaxis
25. Altered Mental Status
26. Adult COPD / Asthma
27. Diabetic Adult
28. Dialysis / Renal Failure
29. Hypertension
30. Hypotension / Shock
31. Overdose / Toxic Ingestion
32. Seizure
33. Suspected Stroke
34. Syncope
35. Vomiting & Diarrhea

36. None
37. Childbirth / Labor
38. Newly Born
39. Obstetrical Emergency
40. Adult Thermal Burn
41. Head Trauma
42. Multiple Trauma
43. None
44. Pediatric Airway
45. Pediatric Failed Airway
46. Pediatric Pain Control
47. None
48. Pediatric Asystole / PEA
49. Pediatric Bradycardia
50. Pediatric Pulmonary Edema / CHF
51. Pediatric Pulse less arrest
52. Pediatric Tachycardia
53. Pediatric V-Fib / Pulse less V Tach
54. Pediatric Post Resuscitation
55. Pediatric Allergic Reaction
56. Pediatric Altered Mental Status
57. None
58. Pediatric Diabetic
59. Pediatric Hypotension / Shock
60. Pediatric Overdose / Toxic Ingestion
61. Pediatric Respiratory Distress
62. Pediatric Seizure
63. Pediatric Vomiting / Diarrhea
64. None
65. Pediatric Head Trauma
66. Pediatric Multiple Trauma
67. Pediatric Thermal Burn
68. None
69. Triage
70. Dental Problems
71. Epistaxis
72. Fever / Infection Control
73. Police Custody
74. Emergencies involving Indwelling central lines
75. Respiratory Distress with a Tracheostomy Tube

76. Emergencies involving Ventilators
77. None
78. Bites & Envenomations
79. Carbon Monoxide / Cyanide
80. Drowning / Submersion Injury
81. Hyperthermia
82. Hypothermia / Frostbite
83. Marine Envenomations / Injury
84. WMD – Nerve Agent Protocol
85. None
86. Blast Injury / Incident
87. Chemical & Electrical Burn
88. Crush Syndrome Trauma
89. Extremity Trauma
90. Selective Spinal Immobilization
91. Radiation Incident

# Universal Patient Care




General Section Protocols

# Universal Patient Care



**Scene Safety Evaluation:**
Identify potential hazards to rescuers, patient and public.
Identify number of patients and utilize START protocol if indicated.
Observe patient position and surroundings.

**General:**
All patient care must be appropriate to your level of training and documented in the PCR.

The PCR / EMR narrative should be considered a story of the circumstances, events and care of the patient and should allow a reader to understand the complaint, the assessment, the treatment, why procedures were performed and why indicated procedures were not performed as well as ongoing assessments and response to treatment and interventions.

**Adult Patient:**
An adult is considered hypotensive when Systolic Blood Pressure is less than 90 mmHg.
Diabetic patients and women may have atypical presentations of cardiac related problems such as MI.
General weakness can be the symptom of a very serious underlying process.
Beta blockers and other cardiac drugs may prevent a reflexive tachycardia in shock with low to normal pulse rates.

**Geriatric Patient:**
Hip fractures and dislocations have high mortality.
Altered mental status is not always dementia. Always check Blood Sugar and assess signs of stroke, trauma, etc. with any alteration in a patient's baseline mental status.
Minor or moderate injury in the typical adult may be very serious in the elderly.

**Pediatric Patient:**
Pediatric patient is defined by those which fit on the Broselow-Luten Resuscitation Tape, Age 15 years or less and / or weight 49 kg or less. Patients off the Broselow-Luten tape should have weight based medications until age 16 or greater or weight greater than or equal to 50 kg. Special needs children may require continued use of Pediatric based protocols regardless of age and weight.

Initial assessment should utilize the Pediatric Assessment Triangle which encompasses Appearance, Work of Breathing and Circulation to skin.

The order of assessment may require alteration dependent on the developmental state of the pediatric patient.

Generally the child or infant should not be separated from the caregiver unless absolutely necessary during assessment and treatment.

**Patient Refusal:**
Patient refusal is a high risk situation. Encourage patient to accept transport to medical facility. Encourage patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient's capacity to refuse care.
Guide to Assessing capacity:

***Patient should be able to communicate a clear choice:*** This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.

***Relevant information is understood:*** Patient should be able to display a factual understanding of the illness, the options and risks and benefits.

***Appreciation of the situation:*** Ability to communicate an understanding of the facts of the situation. They should be able to recognize the significance of the outcome potentially from their decision.

***Manipulation of information in a rational manner:*** Demonstrate a rational process to come to a decision. Should be able to describe the logic they are using to come to the decision, though you may not agree with decision.

Special note on oxygen administration and utilization:
Oxygen is ubiquitous in prehospital patient care and probably over utilized. Oxygen is a pharmaceutical with indications, contraindications as well as untoward side effects. Recent research demonstrates a clear link with increased mortality when given in overdose (hyperoxia / hyperventiation) in cardiac arrest.
Utilize oxygen when indicated and not because it is available. A reasonable target oxygen saturation in all treatment protocols is 94 % regardless of delivery device.



**Pearls**

- **Recommended Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status with GCS, and location of injury or complaint.**
- **Any patient contact which does not result in an EMS transport must have a completed disposition form.**
- **A pediatric patient is defined by fitting on the Broselow-Luten tape, Age ≤ 15, weight ≤ 49 kg.**
- **Pediatric Airway Protocols are defined by patients ≤ 11 years of age.**
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Never hesitate to contact medical control for patient who refuses transport.
- Blood Pressure is defined as a Systolic / Diastolic reading. A palpated Systolic reading may be necessary at times.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading to illness / injury

# Adult Airway

*Protocols 1, 2 and 3 should be utilized together (even if agency is not using RSI) as they contain very useful information for airway management.*

Assess Respiratory Rate, Effort, Oxygenation
Is Airway / Breathing Adequate?

YES → Supplemental oxygen
Goal oxygen saturation ≥ 90%
Exit to Appropriate Protocol

NO ↓

**Basic Maneuvers First**
-open airway chin lift / jaw thrust
-nasal or oral airway
-Bag-valve mask (BVM)

Spinal Immobilization Procedure
***if indicated***

Consider AMS Protocol

↔ Adult / Pediatric Respiratory Distress With a Tracheostomy Tube Protocol
***if indicated***

Airway Patent?

NO → Airway Foreign Body Obstruction Procedure
I — Direct Laryngoscopy

Complete Obstruction?

YES → P — Airway Cricothyrotomy Surgical Procedure → Monitor / Reassess Supplemental Oxygen ***if indicated*** Exit to appropriate protocol

NO → Unable to Ventilate and Oxygenate ≥ 90% during or after one (1) or more unsuccessful intubation attempts .

Anatomy inconsistent with continued attempts.

Three (3) unsuccessful attempts by most experienced EMT-P/I.

→ Exit to Adult Failed Airway Protocol

YES ↓

Breathing / Oxygenation Support needed?

YES → Supplemental oxygen BVM
I — Consider Airway CPAP Procedure

BVM / CPAP Effective?

NO → B — Airway BIAD Procedure
I — Oral / Nasotracheal Intubation Procedure
P — Consider RSI Protocol ***if available***

YES ↓

NO ↓

P — Consider Sedation
***If BIAD or ETT in place***
**Midazolam 2.5 mg IV/IO**
*May repeat in 5 minutes if needed. Use only with definitive airway in place.*

**Notify Destination or Contact Medical Control**

Adult General Section Protocols

# Adult Airway

Always weigh the risks and benefits of endotracheal intubation in the field against transport. All prehospital endotracheal intubations are be considered high risk. If ventilation / oxygenation is adequate rapid transport may be the best option. The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask (not the laryngoscope).

Few prehospital airway emergencies cannot be temporized or managed with proper BVM techniques.

*Please refer to Protocols 2 and 3 for additional information.*

**Difficult Airway Assessment**

**Difficult BVM Ventilation:**
**MOANS:** Difficult **M**ask seal due to facial hair, anatomy, blood or secretions / trauma; **O**bese or late pregnancy; **A**ge > 55; **N**o teeth (roll gauze and place between gums and cheeks to improve seal); **S**tiff or increased airway pressures (Asthma, COPD, Obese, Pregnant).

**Difficult Laryngoscopy:**
**LEMON:** **L**ook externally for anatomical distortions (small mandible, short neck, large tongue); **E**valuate 3-3-2 Rule (Mouth open should accommodate 3 patient fingers, mandible to neck junction should accommodate 3 patient fingers, chin-neck junction to thyroid prominence should accommodate 2 patient fingers); **M**allampati (difficult to assess in the field); **O**bstruction / Obese or late pregnancy; **N**eck mobility.

**Difficult BIAD:**
**RODS:** **R**estricted mouth opening; **O**bstruction / Obese or late pregnancy; **D**istorted or disrupted airway; **S**tiff or increased airway pressures (Asthma, COPD, Obese, Pregnant);

**Difficult Cricothyrotomy / Surgical Airway:**
**SHORT:** **S**urgery or distortion of airway; **H**ematoma over lying neck; **O**bese or late pregnant; **R**adiation treatment skin changes; **T**umor overlying neck.

**Trauma:** *Utilize in-line cervical stabilization during intubation, BIAD or BVM use. During intubation or BIAD the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.*

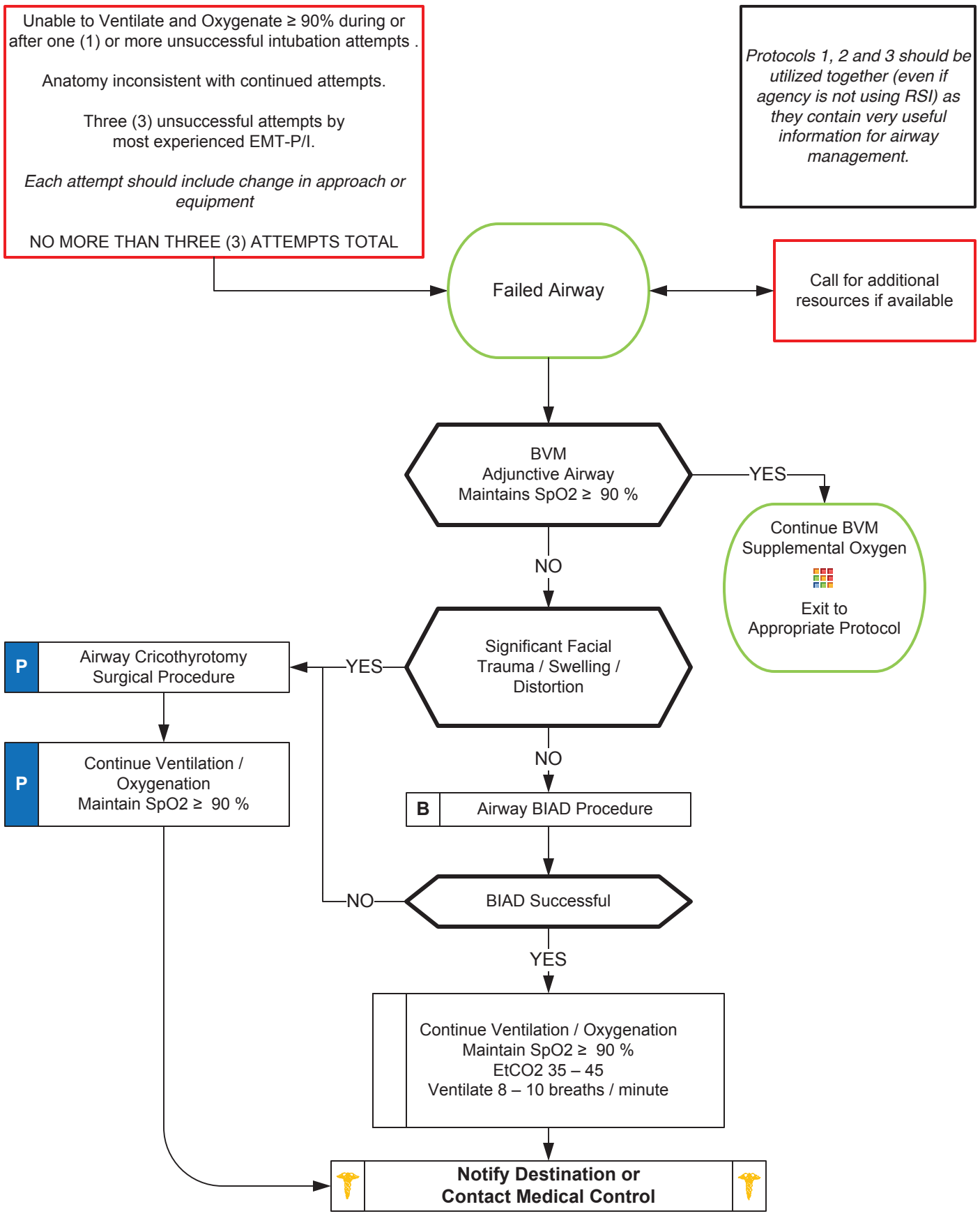
**Nasotracheal intubation:** *Orotracheal intubation is the preferred choice.* Procedure requires patient have spontaneous breathing. Contraindicated in combative patients, anatomically disrupted or distorted airways, increased intracranial pressure, severe facial trauma, basal skull fracture, head injury. Not a rapid procedure and exposes patient to risk of desaturation.



## Pearls

- **This protocol is only for use in patients with an Age ≥ 12 or patients longer than the Broselow-Luten Tape.**
- **Capnometry (Color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography (EtCO2) is strongly recommended for the monitoring of all patients with a BIAD or endotracheal tube.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An Intubation Attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Ventilatory rate should be 8-10 per minute to maintain a EtCO2 of 35-45. Avoid hyperventilation.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- Intermediates and Paramedics should use a BIAD if oral-tracheal intubation is unsuccessful.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic – use oxygen, not a paper bag.
- Cricoid pressure and BURP maneuver may be used to assist with difficult intubations. They may worsen view in some cases.
- Hyperventilation in deteriorating head trauma should only be done to maintain a $EtCO_2$ of 30-35.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well and consider c-collar (in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.

# Adult, Failed Airway



# Adult, Failed Airway

A failed airway occurs when a provider begins a course of airway management by endotracheal intubation and identifies that intubation by that means will not succeed.

**Conditions which define a Failed Airway:**

1. Failure to maintain adequate oxygen saturation 90 % or greater after 2 or more failed intubation attempts.

2. Three (3) failed at intubation by the most experienced prehospital provider on scene even when adequate oxygen saturation 90 % or greater can be maintained.

3. Unable to maintain adequate oxygen saturation 90 % or greater with BVM techniques and insufficient time to attempt alternative maneuvers. A patient near death or dying.

***The most important way to avoid a failed airway is to identify patients with expected difficult airway, difficult BVM ventilation, difficult BIAD, difficult laryngoscopy and / or difficult cricothyrotomy.***

*Please refer to Protocol 1, Adult Airway page 2 for information in how to identify the patient with potential difficult airway.*

**Position of patient:**
In the field setting improper position of the patient and rescuer are responsible for many failed and difficult intubations. Often this is dictated by uncontrolled conditions present at the scene and we must adapt. However many times the rescuer does not optimize patient and rescuer position. The sniffing position or the head simply extended upon the neck are probably the best positions. The goal is to align the ear canal with the suprasternal notch in a straight line.

In the obese or late pregnant patient elevating the torso by placing blankets, pillows or towels will optimize the position. This can be facilitated by raising the head of the cot.

**Use of cot in optimal patient / rescuer position:**
The cot can be elevated and lowered to facilitate intubation. With the patient on the cot raise until the patients nose is at the level of your umbilicus which will place you at the optimal position.

**Trauma:** *Utilize in-line cervical stabilization during intubation, BIAD or BVM use. During intubation or BIAD the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.*

**Cricothyrotomy / Surgical Airway Procedure:**
Use in patients 12 years of age and greater only. Percutaneous transtracheal jet ventilation is used in younger patients.

**Relative contraindications include:**
Pre-existing laryngeal or tracheal tumors, infections or abscess overlying the cricoid area.
Hematoma or anatomical landmark destruction / injury.



**Pearls**

- **If first intubation attempt fails, make an adjustment and then consider:**
  - Different laryngoscope blade / Video or other optical laryngoscopy devices
  - Gum Elastic Bougie
  - Different ETT size
  - Change cricoid pressure. Cricoid pressure no longer routinely recommended and may worsen view.
  - Apply BURP maneuver (Push trachea Back [posterior], Up, and to patient's Right)
  - Change head positioning
- Continuous pulse oximetry should be utilized in all patients with an inadequate respiratory function.
- Continuous EtCO2 should be applied to all patients with respiratory failure or to all patients with advanced airways.
- **Notify Medical Control AS EARLY AS POSSIBLE about the patient's difficult / failed airway.**

# Airway, Rapid Sequence Intubation (*OPTIONAL*)

**Indications for RSI**

**Failure to protect the airway**

**Unable to oxygenate**

**Unable to ventilate**

**Impending airway compromise**

**Age ≥ 12 / Length > Broselow-Luten Tape**

**Procedure will remove patient's protective airway reflexes and ability to ventilate.**

**You must be sure of your ability to intubate before beginning this procedure.**

**Must have two (2) EMT-P on scene**

**Red Text** are the key performance indicators used to evaluate protocol compliance.

An Airway Evaluation Form must be completed on every patient who receives Rapid Sequence Intubation.

*Protocols 1, 2 and 3 should be utilized together (even if agency is not using RSI) as they contain very useful information for airway management.*

**Preoxygenate 100% O2**

I: IV Procedure (preferably 2 sites) | P: IO Procedure

P: Assemble Airway Equipment
Suction equipment
Alternative Airway Device

Evidence of Head Injury / CVA or Reactive Airway Disease?

NO → P: Etomidate 0.3 mg/kg IV / IO

YES →

P: ***Optional per local medical control***
**Lidocaine 1.5 mg/kg IV / IO**

P:
**Etomidate 0.3 mg/kg IV / IO**
**Or**
**Ketamine 1.5 - 2 mg/kg IV / IO**

**Succinylcholine 1.5 mg / kg IV/ IO**
***Or***
**Rocuronium 1 mg / kg IV / IO**
**(if Succinylcholine contraindicated)**

**Intubate trachea**

**Placement Verified**
**Continuous Capnography**

NO → May Repeat Sequence x1

P: Confirm appropriate drug doses
Change positioning / approach / equipment

***If indicated*** → P: Etomidate 0.3 mg/kg IV / IO

***After 2nd RSI Attempt*** → Exit to Adult Failed Airway Protocol

Consider Restraints Physical Procedure

P: Consider Gastric Tube Insertion Procedure

Awakening or Moving after intubation

NO → Notify Destination or Contact Medical Control

YES →

P:
**Midazolam 2.5 mg (0.1 – 0.2 mg/kg) IV / IO**
Repeat every 3 – 5 minutes as needed.

**Morphine 4 mg IV / IO**
Repeat **2 mg** every 5 minutes as needed.
**Maximum 10 mg**
Or
**Fentanyl 50 - 75 mcg IV / IO**
Repeat **25 mcg** every 20 minutes as needed.
**Maximum 200 mcg**

Consider long term paralytic
**Vecuronium 10 mg (0.1 mg/kg) IV / IO**
If needed for patient movement.

**Notify Destination or Contact Medical Control**

# Airway, Rapid Sequence Intubation (*OPTIONAL*)





## Pearls

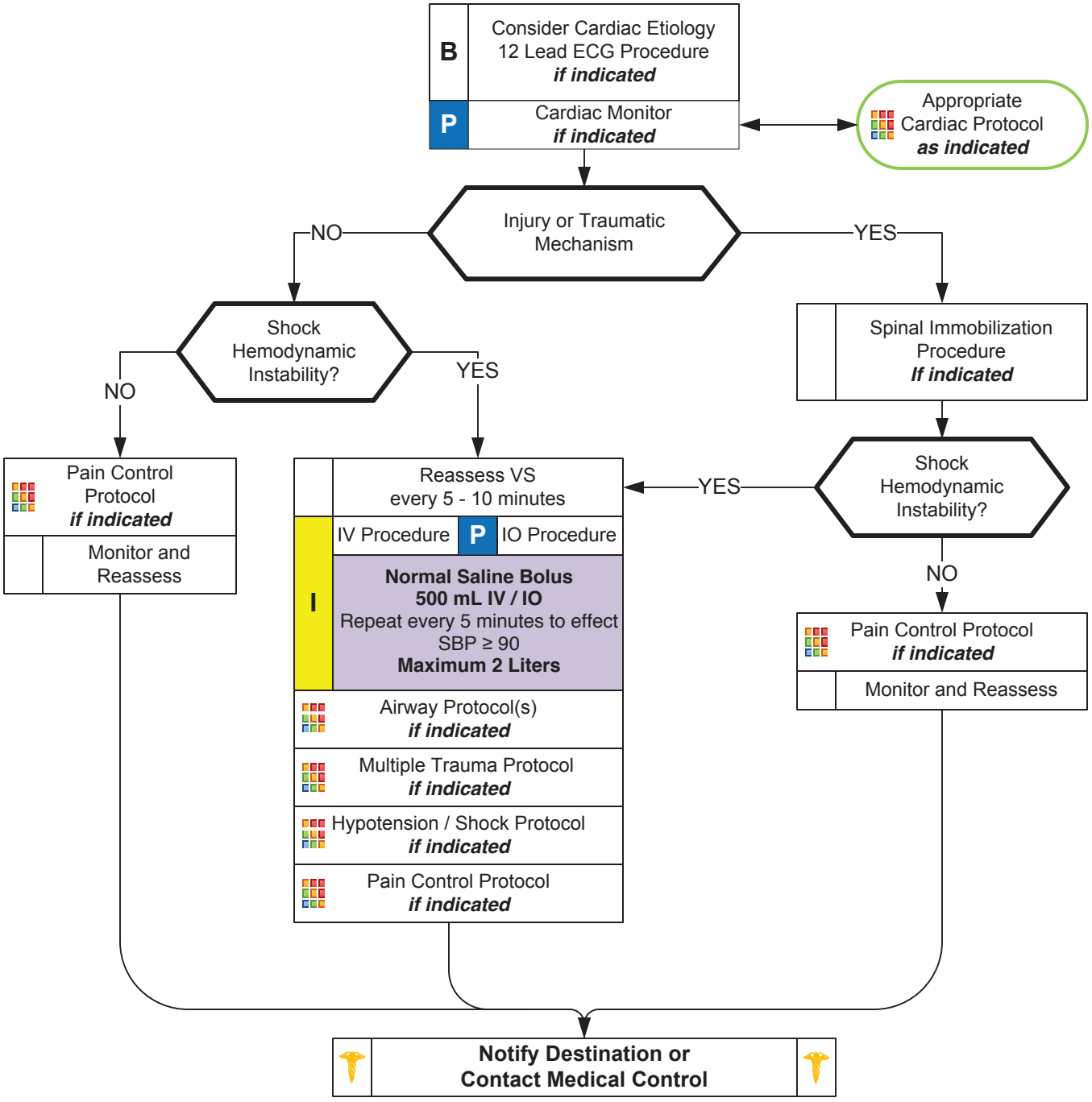
- **Agencies must maintain a separate Performance Improvement Program specific to Rapid Sequence Intubation.**
- **This procedure requires at least 2 EMT-Paramedics. Divide the workload – ventilate, suction, cricoid pressure, drugs, intubation.**
- **This protocol is only for use in patients with an Age ≥ 12 or patients longer than the Broselow-Luten Tape.**
- **Once a patient has been given a paralytic drug, *YOU* ARE RESPONSIBLE FOR VENTILATIONS if desaturation occurs.**
- **Continuous Waveform Capnography and Pulse Oximetry and are required for intubation verification and ongoing patient monitoring**
- **Before administering any paralytic drug, screen for contraindications with a thorough neurologic exam.**
- **Agencies utilizing Ketamine must submit a local systems plan to State Medical Director detailing how the drug is used in your program.**
- If First intubation attempt fails, make an adjustment and try again:
  - Different laryngoscope blade
  - Different ETT size
  - Change head positioning
  - Change cricoid pressure; No longer routinely recommended and may worsen your view.
  - Continuous pulse oximetry should be utilized in all patients.
  - Consider applying BURP maneuver (Back [posterior], Up, and to patient's Right)
- Protect the patient from self-extubation when the drugs wear off. Longer acting paralytics may be needed post-intubation.
- Consider Naso or orogastric tube placement in all intubated patients to limit aspiration and decompress stomach if needed.
- RSI not recommended in urban setting (short transport) when able to maintain oxygen saturation ≥ 90 %.

# Back Pain

## History
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain / injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Improvement or worsening with activity

## Signs and Symptoms
- Pain (paraspinous, spinous process)
- Swelling
- Pain with range of motion
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel / bladder dysfunction

## Differential
- Muscle spasm / strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis
- Aneurysm
- Pneumonia
- Spinal Epidural Abscess
- Metastatic Cancer
- AAA




Adult General Section Protocols

# Back Pain



**Pearls**

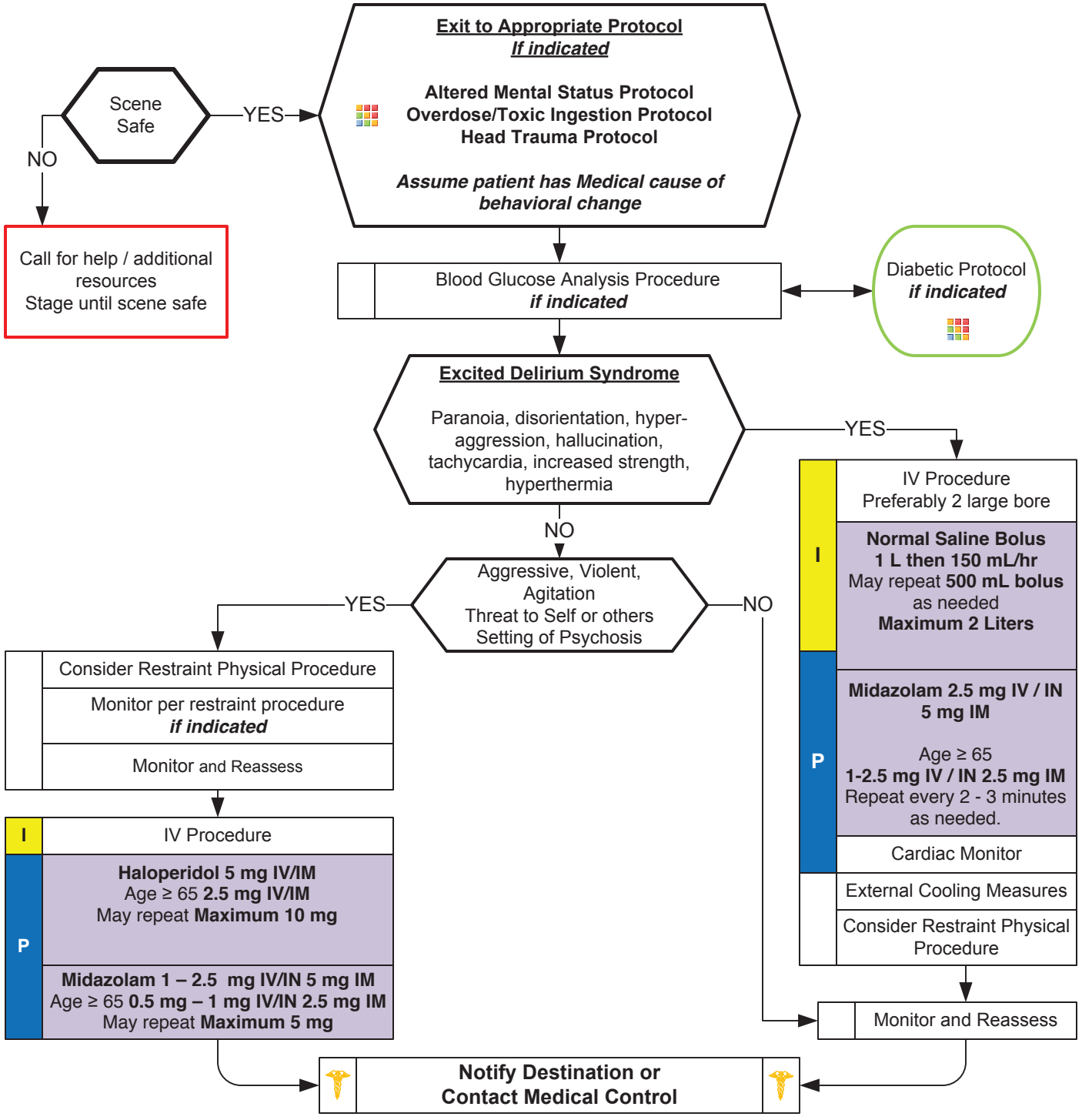
- Patients with underlying spinal deformity should be immobilized in their functional position.
- Abdominal aneurysms are a concern especially in patients over the age of 50 and / or with vascular or hypertensive disease.
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.
- Patients with midline pain over the spinous processes should be spinally immobilized.
- Any bowel or bladder incontinence is a significant finding which requires immediate medical evaluation
- In patient with history of IV drug abuse a spinal epidural abscess should be considered.

# Behavioral

## History
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse / overdose
- Diabetes

## Signs and Symptoms
- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal / homicidal thoughts

## Differential
- Altered Mental Status differential
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders




Adult General Section Protocols

# Behavioral





## Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro**
- **Crew / responders safety is the main priority.**
- **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If patient is suspected of agitated delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.
- **Excited Delirium Syndrome:**
  Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
- **Extrapyramidal reactions:**
  Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements. Typically an adverse reaction to antipsychotic drugs like Haloperidol and may occur with your administration. When recognized give **Diphenhydramine 50 mg IV / IO / IM / PO** in adults or **1 mg/kg IV / IO / IM / PO** in pediatrics.

# Pain Control: Adult

## History
- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- Past medical history
- Medications
- Drug allergies

## Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

## Differential
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)

Enter from
**Protocol** based on **Specific Complaint**

Assess Pain Severity
Use combination of Pain Scale, Circumstances, MOI, Injury or Illness severity

### Mild

**B**
**Ibuprofen 10 mg/kg PO**
**(400 – 800 mg typical adult)**
**Or**
**Acetaminophen (1 - 2) 325mg PO**
**(typical adult)**

**I** Consider IV Procedure

Monitor and Reassess

### Moderate to Severe

**I** IV Procedure **P** IO Procedure

**Ketorolac 30 mg IV / IO**
**60 mg IM**

**P**
**Nitrous Oxide 50/50 Mix**
**Per local protocol**

**P**

Cardiac Monitor

**Morphine 4 mg (0.1 mg/kg) IV / IO**
Repeat **2 mg** every 5 minutes as needed.
**Maximum 10 mg**
***Or***
**Fentanyl 50 - 100 mcg IV / IO / IM / IN**
Repeat **50 mcg** every 5 minutes as needed.
**Maximum 200 mcg**

Monitor and Reassess
Every 10 minutes following sedative

Monitor and Reassess

**Notify Destination or**
**Contact Medical Control**

# Pain Control: Adult

PEARLS:

* Pain severity (0-10) is a vital sign to be recorded before and after IN medication delivery and at patient hand off. Monitor BP closely as sedative and pain control agents may cause hypotension.

* All patients who receive "IN" medications must be observed 15 minutes for drug reaction in the event that no transport occurs.



**Pearls**

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO or IM medication delivery and at patient hand off. Monitor BP closely as sedative and pain control agents may cause hypotension.**
- **Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.**
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction in the event no transport occurs.
- Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities, headaches, or abdominal pain.
- **Ketorolac (Toradol) and Ibuprofen should not be used in patients with known renal disease or renal transplant, in patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications), with active bleeding, headaches, abdominal pain, stomach ulcers or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- Do not administer **Acetaminophen** to patients with a history of liver disease.
- Burn patients may required higher than usual opioid doses to effect adequate pain control

# Scene Rehabilitation: General (Optional)

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

**Initial Process**
1. Personnel logged into General Rehabilitation Section
2. VS Assessed / Recorded (If HR > 110 then obtain Temp)
3. Personnel assessed for signs / symptoms
4. Remove PPE, Body Armor, Haz-Mat Suits, Turnout Gear, Other equipment as indicated

Significant Injury
Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Diastolic Blood Pressure ≤ 80

YES → Exit to Scene Rehabilitation Responder Protocol

NO ↓

Heat or Cold stress

YES → **HEAT STRESS**

**Active Cooling Measures**
Forearm immersion, cool shirts, cool mist fans etc.
10 – 20 Minutes

**Rehydration Techniques**
12 – 32 oz Oral Fluid over 20 minutes
*Oral Rehydration may occur along with Active Cooling Measures*
*Firefighters should consume 8 ounces of fluid between SCBA change-out*

YES → **COLD STRESS**

**Active Warming Measures**
Dry responder, place in warm area
Hot packs to axilla and / or groin

**Rehydration Techniques**
12 – 32 oz Oral Fluid over 20 minutes
*Oral Rehydration may occur along with Active Warming Measures*
*Firefighters should consume 8 ounces of fluid between SCBA change-out*

NO ↓

Reassess responder after 20 Minutes in General Rehabilitation Section
Reassess VS

HR ≥ 110 — YES → Temp ≥ 100.6 — YES → Responder Cannot Wear Protective Gear; Extend Rehabilitation Time Until VS Improve

HR ≥ 110 — NO → Temp ≥ 100.6 — NO → HR ≥ 110 — YES → Extend Rehabilitation Time Until VS Improve

Temp ≥ 100.6 — YES → HR ≥ 110

Temp ≥ 100.6 — NO → HR ≥ 110 — NO →

Discharge Responder from General Rehabilitation Section

Reports for Reassignment

**VITAL SIGN CAVEATS**

***Blood Pressure:***
Prone to inaccuracy on scenes. Must be interpreted in context.

Firefighters have elevated blood pressure due to physical exertion and is not typically pathologic.

Firefighters with Systolic BP ≥ 160 or Diastolic BP ≥ 100 may need extended rehabilitation. However this does not necessarily prevent them from returning to duty.

***Temperature:***
Firefighters may have increased temperature during rehabilitation.

# Scene Rehabilitation: General (Optional)



**Pearls**

- **This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.**
- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.

# Scene Rehabilitation: Responder (Optional)

**Remove:**
PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment as indicated

**Continue:**
Heat and Cold Stress treatment techniques from General Rehab Section

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

| NFPA Age Predicted 85 % Maximum Heart Rate | |
|---|---|
| 20 - 25 | 170 |
| 26 - 30 | 165 |
| 31 - 35 | 160 |
| 36 - 40 | 155 |
| 41 - 45 | 152 |
| 46 - 50 | 148 |
| 51 -55 | 140 |
| 55 - 60 | 136 |
| 61 - 65 | 132 |

**Initial Process**
1. Personnel logged into Responder Rehabilitation Section
2. VS Assessed and Recorded / Orthostatic Vital Signs
3. Pulse oximetry and SPCO (if available)
4. Personnel assessed for signs / symptoms

Use in conjunction with General Rehabilitation Protocol

20 Minute Rest Period

Pulse Rate > 85 % NFPA Age Predicted Maximum — YES → I **Normal Saline IV Bolus Up to 2 L** *Until Pulse Rate is 110 or less And Systolic BP is 100 or greater*

NO

Systolic BP ≥ 160 Or Diastolic BP ≥ 100 — YES

NO

Respirations < 8 or > 40 — YES

NO

Pulse oximetry < 90 % SPCO > 10 % — YES

NO

Temperature ≥ 100.6 — YES

NO

Discharge Responder from General Rehabilitation Section

Reports for Reassignment

Mandatory Rest Period
**Rehydration is Most Important**
Re-evaluate in 10 minutes

No improvement after 30 minutes of additional rehabilitation

**Notify Destination or Contact Medical Control**

Adult General Section Protocols

**Pearls**
- **This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.**
- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- **Utilized when responder is not appropriate for General Rehabilitation Protocol.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.

# Adult Asystole / Pulseless Electrical Activity

NCCEP

NORTH CAROLINA EMS OFFICE of EMS

## History
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
  - Tricyclic
  - Digitalis
  - Beta blockers
  - Calcium channel blockers
- DNR, MOST, or Living Will

## Signs and Symptoms
- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

## Differential
- Hypovolemia (Trauma, AAA, other)
- Cardiac tamponade
- Hypothermia
- Drug overdose (Tricyclic, Digitalis, Beta blockers, Calcium channel blockers)
- Massive myocardial infarction
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia

Cardiac Arrest Protocol

**Criteria for Death / No Resuscitation Review DNR / MOST Form**

YES →
Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO →

***Begin Continuous CPR Compressions***
***Push Hard (≥ 2 inches) Push Fast (≥ 100 / min)***
***Change Compressors every 2 minutes***
***(Limit changes / pulses checks ≤ 10 seconds)***

P — Cardiac Monitor

**Shockable Rhythm**

YES → Follow Rhythm Appropriate Protocol

NO ↓

Search for Reversible Causes →

Dialysis / Renal Failure Protocol ***if indicated***

I

IV Procedure | P | IO Procedure

Consider **Normal Saline Bolus 500 mL IV / IO**

**Epinephrine (1:10,000) 1 mg IV / IO**
Repeat every 3 to 5 minutes
**Or**
**Vasopressin 40 units IV / IO**
May replace first or second dose of epinephrine

P — Consider Chest Decompression Procedure

**Criteria for Discontinuation**

YES → Discontinue Resuscitation

Follow Deceased Subjects Policy

NO ↓

**Notify Destination or Contact Medical Control**

**AT ANY TIME**

**Return of Spontaneous Circulation**

**Go to Post Resuscitation Protocol**

**Reversible Causes**

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia
Hypoglycemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

# Adult Asystole / Pulseless Electrical Activity





**Pearls**

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Breathing / Airway management after 2 rounds of compressions (2 minutes each round.)**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- If no IV / IO, drugs that can be given down ET tube should have dose doubled and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV/IO is the preferred route when available.
- Consider each possible cause listed in the differential: Survival is based on identifying and correcting the cause.
- Potential association of PEA with hypoxia so placing definitive airway with oxygenation early may provide benefit.
- PEA caused by sepsis or severe volume loss may benefit from higher volume of normal saline administration.
- Return of spontaneous circulation after Asystole / PEA requires continued search for underlying cause of cardiac arrest.
- Treatment of hypoxia and hypotension are important after resuscitation from Asystole / PEA.
- Asystole is commonly an end-stage rhythm following prolonged VF or PEA with a poor prognosis.
- Sodium bicarbonate no longer recommended. Consider in the dialysis / renal patient, known hyperkalemia or tricyclic overdose at 50 mEq total IV / IO.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- Potential protocols used during resuscitation include Overdose / Toxic Ingestion, Diabetic and Dialysis / Renal Failure.

# Bradycardia; Pulse Present

NCCEP

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## History
- Past medical history
- Medications
  - Beta-Blockers
  - Calcium channel blockers
  - Clonidine
  - Digoxin
- Pacemaker

## Signs and Symptoms
- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

## Differential
- Acute myocardial infarction
- Hypoxia
- Pacemaker failure
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury (elevated ICP) or Stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose

**Heart Rate < 60 / minute and Symptomatic**
Hypotension, Acute AMS, Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to bradycardia

NO → Exit to Appropriate Protocol

YES ↓

Dyspnea / Increased Work of Breathing especially with hypoxia

YES → Appropriate Airway and / or Respiratory Distress Protocol

NO ↓

| | |
|---|---|
| B | 12 Lead ECG Procedure |
| P | Cardiac Monitor |
| I | IV Procedure / P IO Procedure |

**Suspected Beta-Blocker or Calcium Channel Blocker**

**Follow Overdose / Toxic Ingestion Protocol**

P — **Atropine 0.5 mg IV / IO**
Repeat every 3 – 5 minutes
**Maximum 3 mg**

I — **Normal Saline Bolus 500 mL IV / IO**
**May repeat as needed**
**Maximum 2 Liters**

P — *Consider Sedation*
**Midazolam 1 - 2 mg IV / IO**
May repeat as needed
**Maximum dose 5 mg**

P — Transcutaneous Pacing
If not responsive to Atropine
*Consider earlier in 2nd or 3rd AVB)*

Consider
**Dopamine 5 – 20 mcg/kg/min IV / IO**
If no clinical response

**Notify Destination or Contact Medical Control**

P — **Epinephrine Infusion**
**1 – 10 mcg / min IV / IO**

Adult Cardiac Section Protocols

# Bradycardia; Pulse Present



**Pearls**

- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Bradycardia causing symptoms is typically < 50/minute. Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Atropine: Caution in setting of acute MI. The use of Atropine for PVCs in the presence of a MI may worsen heart damage. Should not delay Transcutaneous Pacing with poor perfusion. Ineffective in cardiac transplantation.**
- Utilize transcutaneous pacing early if no response to atropine. If time allows transport to specialty center as transcutaneous pacing is a temporizing measure and patient will likely require transvenous pacemaker.
- Wide complex, bizarre appearance of complex with slow rhythm consider hyperkalemia.
- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)
- Hypoxemia is a common cause of bradycardia be sure to oxygenate the patient and support respiratory effort.

# Cardiac Arrest; Adult

NCCEP

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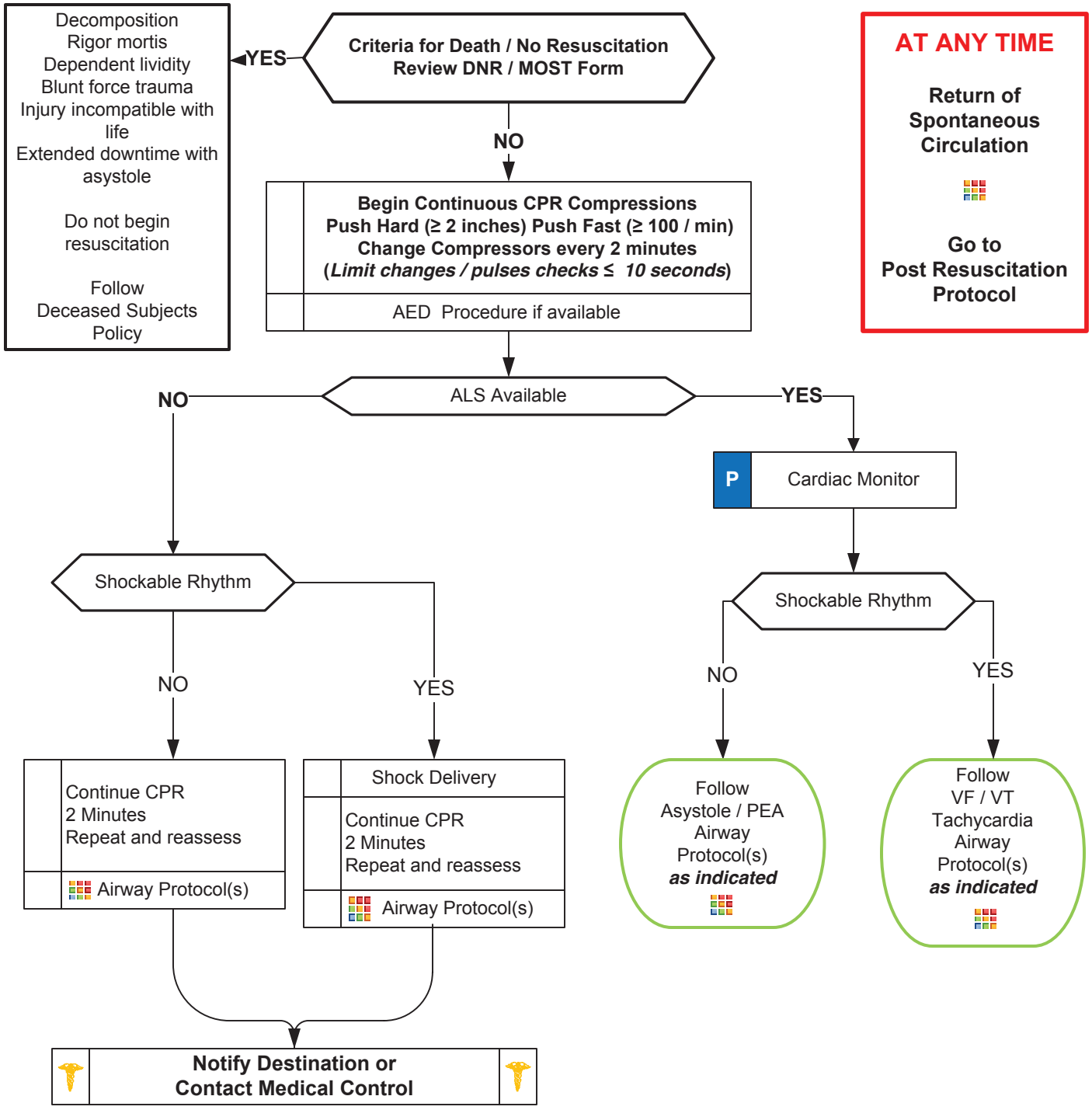
## History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness

## Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

## Differential
- Medical vs. Trauma
- VF vs. Pulseless VT
- Asystole
- PEA
- Primary Cardiac event vs. Respiratory arrest or Drug Overdose




Adult Cardiac Section Protocols

# Cardiac Arrest; Adult





**Pearls**

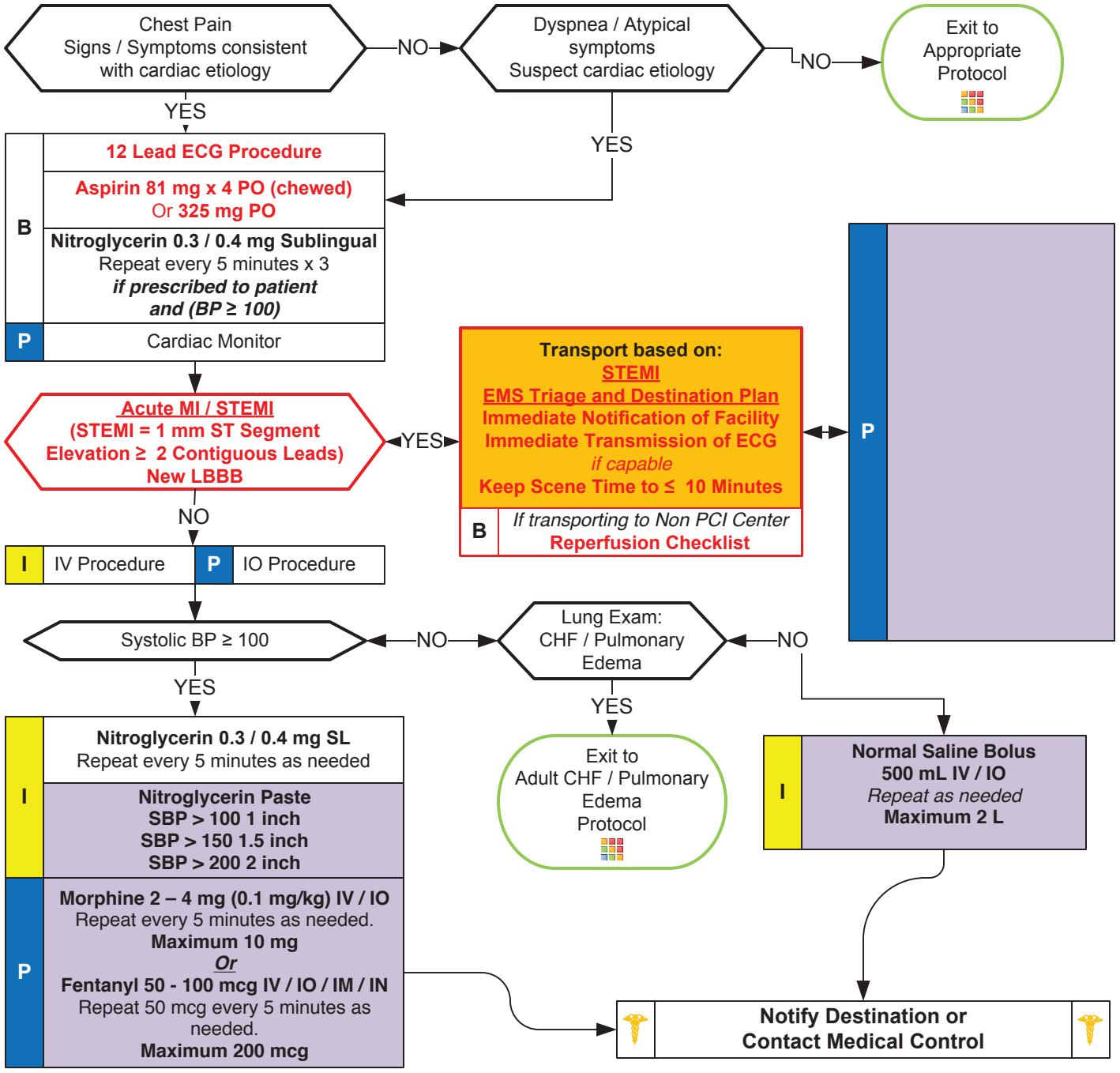
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Breathing / Airway management after second shock and / or 2 rounds of compressions (2 minutes each round.)**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach assigning responders to predetermined tasks.
- Team Focused Approach / Pit-Crew Approach. Refer to optional protocol or development of local agency protocol.
- Reassess and document endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
- Consider mechanical CPR (compression) device if available.
- Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
- Consider Opioid Overdose: Naloxone 2 mg IM / IV / IO / IN. EMT-B may administer Naloxone via IN route only. May give from EMS supply.
- Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.

# Chest Pain: Cardiac and STEMI

## History
- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- **P**alliation / **P**rovocation
- **Q**uality (crampy, constant, sharp, dull, etc.)
- **R**egion / **R**adiation / **R**eferred
- **S**everity (1-10)
- **T**ime (onset /duration / repetition)

## Signs and Symptoms
- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**

## Differential
- Trauma vs. Medical
- Angina vs. Myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GE reflux or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose (Cocaine) or Methamphetamine




Adult Cardiac Section Protocols

# Chest Pain: Cardiac and STEMI



PEARLS:

* Use Nausea / Vomiting protocol, if indicated.
* Start a second IV line if hemodynamically unstable enroute to destination.
* EMT-B may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply. No prior contact to Medical Control is required.

* EMD may utilize the "Aspirin Diagnostic & Instruction Tool" for a patient alert and equal/greater than 16 years old under their Protocol 10, "Chest Pain (Non-Traumatic)" (The National Academy QA Guide Version 12.2, Medical Priority Dispatch System), as authorized by local Medical Control.



**Pearls**

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit**
- **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Patients with STEMI (ST-Elevation Myocardial Infarction) or positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.**
- **If CHF / Cardiogenic shock resulting from inferior (II, III, aVF) MI. Consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and narcotics (Morphine, Fentanyl, or Dilaudid).
- Nitroglycerin and opioids may be repeated per dosing guidelines.
- Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (EMT-P.)
- **EMT-B may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**
- Agency medical director may require Contact of Medical Control prior to administration.

# CHF / Pulmonary Edema

NCCEP

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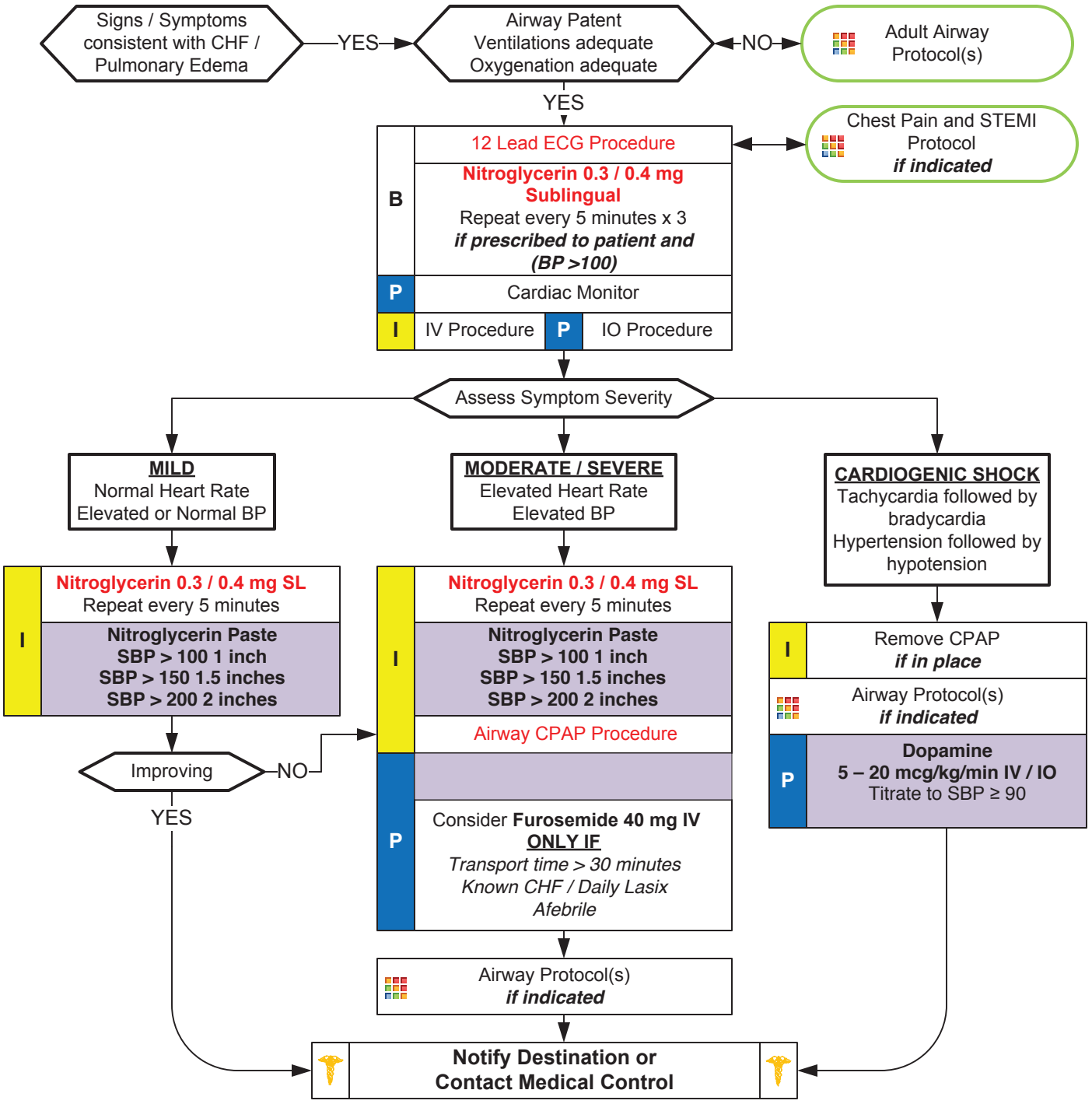
## History
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix, Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Cardiac history --past myocardial infarction

## Signs and Symptoms
- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

## Differential
- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure




Adult Cardiac Section Protocols

# CHF / Pulmonary Edema



PEARLS:

* EMT-B may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply. No prior contact to Medical Control is required.



**Pearls**

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Furosemide and Opioids have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. Even though this historically has been a mainstay of EMS treatment, it is no longer routinely recommended.**
- **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- **If CHF / Cardiogenic shock resulting from inferior (II, III, aVF) MI. Consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If Nitro-paste is used, do not continue to use Nitroglycerin SL.
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.
- Consider myocardial infarction in all these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- Document CPAP application using the CPAP procedure in the PCR. Document 12 Lead ECG using the 12 Lead ECG procedure.
- **EMT-B may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply**.
- Agency medical director may require Contact of Medical Control.

# Adult Tachycardia
## Narrow Complex (≤ 0.11 sec)

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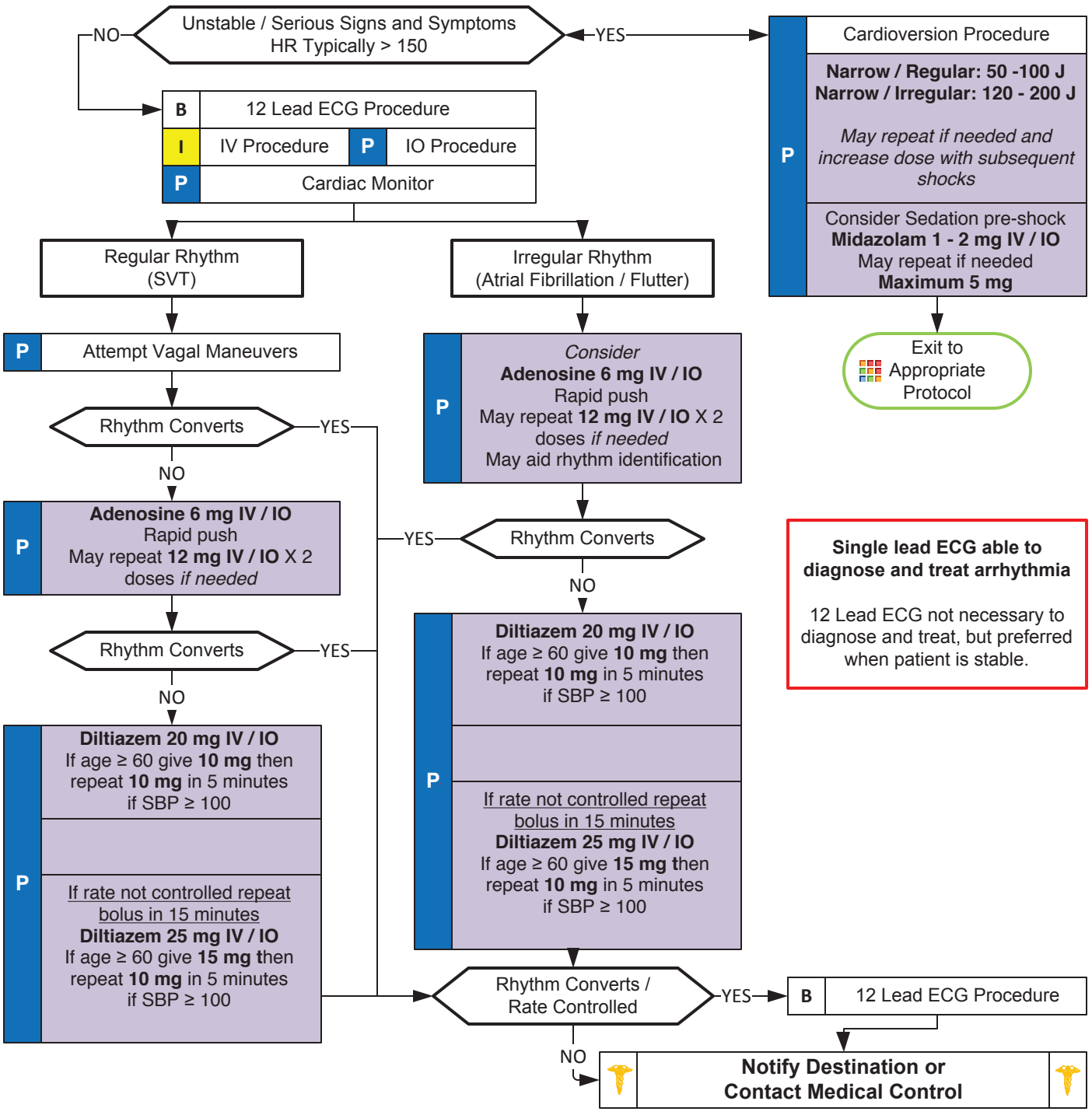
### History
- Medications
  (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

### Signs and Symptoms
- Heart Rate > 150
- Systolic BP < 90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
  - Atrial/Sinus tachycardia
  - Atrial fibrillation / flutter
  - Multifocal atrial tachycardia
  - Ventricular Tachycardia

### Differential
- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus




Adult Cardiac Section Protocols

# Adult Tachycardia
## Narrow Complex (≤ 0.11 sec)



**Pearls**

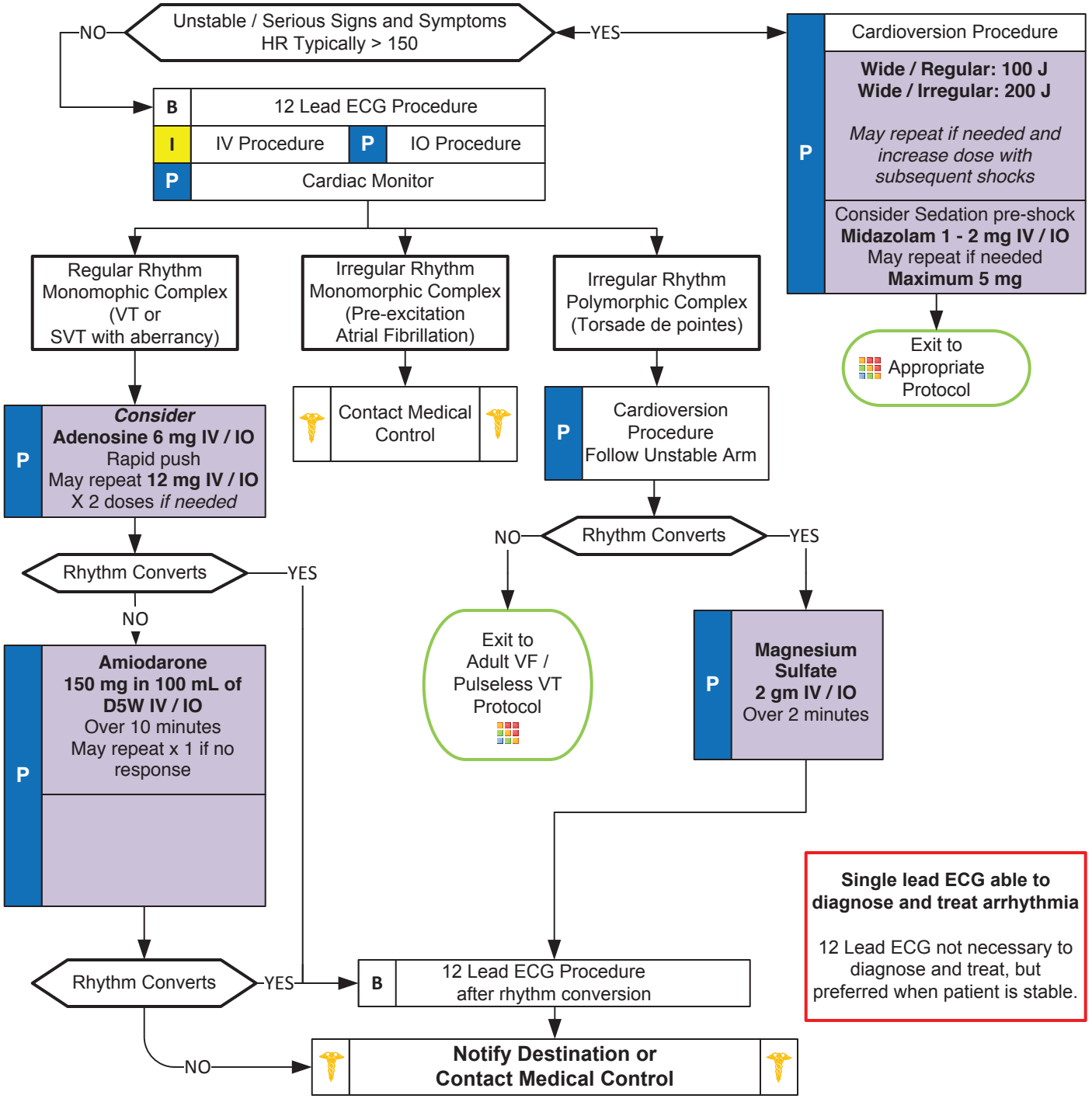
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic tachycardia usually occurs at rates of 120 -150 and typically ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
  **Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g. Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- Typical sinus tachycardia is in the range of 100 to (200 - patient's age) beats per minute.
- **Regular Narrow-Complex Tachycardias:**
  Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert up to 25 % of SVT.
  Adenosine should be pushed rapidly via proximal IV site followed by 20 mL Normal Saline rapid flush.
  Agencies using both calcium channel blockers and beta blockers need choose one primarily. Giving the agents sequentially requires Contact of Medical Control. This may lead to profound bradycardia / hypotension.
- **Irregular Tachycardias:**
  First line agents for rate control are calcium channel blockers or beta blockers.
  Agencies using both calcium channel blockers and beta blockers need choose one primarily. Giving the agents sequentially requires Contact of Medical Control. This may lead to profound bradycardia / hypotension.
  Adenosine may not be effective in identifiable atrial fibrillation / flutter, yet is not harmful and may help identify rhythm.
- **Synchronized Cardioversion:**
  Recommended to treat UNSTABLE Atrial Fibrillation, Atrial Flutter and Monomorphic-Regular Tachycardia (VT.)
- Monitor for hypotension after administration of Calcium Channel Blockers or Beta Blockers.
- Monitor for respiratory depression and hypotension associated with Midazolam.
- Continuous pulse oximetry is required for all SVT patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

# Adult Tachycardia
# Wide Complex (≥0.12 sec)

## History
- Medications
  (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

## Signs and Symptoms
- Heart Rate > 150
- Systolic BP <90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
  - Atrial/Sinus tachycardia
  - Atrial fibrillation / flutter
  - Multifocal atrial tachycardia
  - Ventricular Tachycardia

## Differential
- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus




Adult Cardiac Section Protocols

# Adult Tachycardia
## Wide Complex (≥0.12 sec)



**Pearls**

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic tachycardia usually occurs at rates of 120 – 150 and typically ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
  **Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.
- **Regular Wide-Complex Tachycardias:**
  **Unstable condition:**
  Immediate cardioversion or pre-cordial thump if defibrillator not available.
  **Stable condition:**
  Typically VT or SVT with aberrancy. Adenosine may be given if regular and monomorphic and if defibrillator available.
  Verapamil contraindicated in wide-complex tachycardias.
  Agencies using Amiodarone, Procainamide and Lidocaine need choose one agent primarily. Giving multiple anti-arrhythmics requires contact of medical control.
  Atrial arrhythmias with WPW should be treated with Amiodarone or Procainamide
- **Irregular Tachycardias:**
  Wide-complex, irregular tachycardia: Do not administer calcium channel or beta blockers, adenosine as this may cause paradoxical increase in ventricular rate. This will usually require cardioversion. Contact medical control.
- **Polymorphic / Irregular Tachycardia:**
  This situation is usually unstable and immediate defibrillation is warranted.
  When associated with prolonged QT this is likely Torsades de pointes: Give 2 gm of Magnesium Sulfate slow IV / IO.
  Without prolonged QT likely related to ischemia and Magnesium may not be helpful.
- Monitor for respiratory depression and hypotension associated with Midazolam.
- Continuous pulse oximetry is required for all SVT Patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.

# Ventricular Fibrillation
# Pulseless Ventricular Tachycardia

NCCEP

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## History
- Estimated down time
- Past Medical History
- Medications
- Events leading to arrest
- Renal failure / Dialysis
- DNR or MOST form

## Signs and Symptoms
- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on EKG

## Differential
- Asystole
- Artifact / Device Failure
- Cardiac
- Endocrine / Medicine
- Drugs
- Pulmonary

Cardiac Arrest Protocol

P — **Defibrillate 200 J**

**Begin Continuous CPR Compressions**
**Push Hard (≥ 2 inches) Push Fast (≥ 100 / min)**
**Change Compressors every 2 minutes**
**(*Limit changes / pulses checks ≤ 10 seconds*)**

Airway Protocol(s)

IV Procedure | P — IO Procedure

I — **Epinephrine (1:10,000) 1 mg IV / IO**
Repeat every 3 to 5 minutes
**Or**
**Vasopressin 40 units IV / IO**
May replace first or second dose of epinephrine

P — **Defibrillate 200 J**

Dialysis / Renal Failure Protocol ***if indicated***

**AT ANY TIME**

**Return of Spontaneous Circulation**

**Go to Post Resuscitation Protocol**

**Begin Continuous CPR Compressions**
**Push Hard (≥ 2 inches) Push Fast (≥ 100 / min)**
**Change Compressors every 2 minutes**
**(*Limit changes / pulses checks ≤ 10 seconds*)**

**If Rhythm Refractory**
**Continue CPR and give Agency specific Anti-arrhythmics / Epinephrine / Vasopressin during compressions.**
**Continue CPR up to point where you are ready to defibrillate with device charged.**
**Repeat pattern during resuscitation.**

Tosades de points
Low Magnesium States
(Malnourished / alcoholic)
Suspected Digitalis Toxicity

P — **Defibrillate 200 J**
*Consider*
**Magnesium Sulfate 2g IV / IO**
over 2 minutes

P — **Amiodarone 1 mg/min IV / IO**
*if rhythm converts*

P — **Amiodarone 300 mg IV / IO**
May repeat at **150 mg IV / IO**
if no response

**Defibrillate 200 J**

P

High Quality, Continuous Compressions

P — **Lidocaine 1.5 mg/kg IV / IO**
May repeat ½ initial dose in no response

**Defibrillate 200 J**

Return of Spontaneous Circulation

NO → Consider Discontinuation of Resuscitation Policy

YES → Exit to Post Resuscitation Protocol

AND / OR

**Notify Destination or Contact Medical Control**

**Adult Cardiac Section Protocols**

# Ventricular Fibrillation
# Pulseless Ventricular Tachycardia





**Pearls**

- **Recommended Exam: Mental Status**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Breathing / Airway management after second shock and / or 2 rounds of compressions (2 minutes each round.)**
- **Avoid Procainamide in CHF or prolonged QT.**
- Effective CPR and prompt defibrillation are the keys to successful resuscitation.
- If no IV / IO, drugs that can be given down ET tube should have dose doubled and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV / IO is the preferred route when available.
- Reassess and document endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- Do not stop CPR to check for placement of ET tube or to give medications.
- If BVM is ventilating the patient successfully, intubation should be deferred until rhythm has changed or 4 or 5 defibrillation sequences have been completed.
- Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.
- Sodium bicarbonate no longer recommended. Consider in the dialysis / renal patient, known hyperkalemia or tricyclic overdose at 50 mEq total IV / IO.
- Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.

# Post Resuscitation

**History**
- Respiratory arrest
- Cardiac arrest

**Signs/Symptoms**
- Return of pulse

**Differential**
- Continue to address specific differentials associated with the original dysrhythmia

**Repeat Primary Assessment**

| | |
|---|---|
| B | **Optimize Ventilation and Oxygenation**<br>• Maintain SpO2 ≥ 94 %<br>• Advanced airway ***if indicated***<br>• ETCO2 ideally 35 – 45 mm Hg<br>• Respiratory Rate 8 – 12 / minute<br>• Remove Impedance Threshold Device<br>• DO NOT HYPERVENTILATE |
| I | IV Procedure |
| P | IO Procedure |
| B | 12 Lead ECG Procedure |
| P | Cardiac Monitor |
| | Monitor Vital Signs / Reassess |

Hypotension Systolic BP < 90

YES →

| | |
|---|---|
| I | **Normal Saline Bolus 500 mL IV / IO**<br>May repeat as needed<br>if lungs remain clear<br>**Maximum 2 L** |
| P | **Dopamine**<br>**5 – 20 mcg/kg/min IV / IO**<br>Titrate to SBP ≥ 90 |

NO ↓

Follows Commands

NO → Induced Hypothermia Protocol ***if available***

YES ↓

STEMI / Suspicion of MI

YES → Chest Pain and STEMI Protocol STEMI EMS Triage and Destination Plan

NO ↓

Symptomatic Bradycardia

YES → Bradycardia; Pulse Present Protocol

NO ↓

ROSC with Antiarrhythmic given

YES → P: Continue Antiarrhythmic Utilized Refer to Appropriate Arrhythmia Protocol(s)

NO → Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

NO ↓

P

Consider Sedation / Paralysis
Use only with definitive airway in place

**Midazolam 1 - 2 mg IV / IO**
May repeat in 5 minutes if needed
And / Or
**Fentanyl 50 – 100 mcg IV / IO bolus**
May repeat 50 mcg every 5 minutes
As needed
**Maximum 200 mcg**

↔ P

↓

**Notify Destination or Contact Medical Control**

Adult Cardiac Section Protocols

# Post Resuscitation





**Pearls**

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Continue to search for potential cause of cardiac arrest during post-resuscitation care.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.**
- **Initial End tidal $CO_2$ may be elevated immediately post-resuscitation but will usually normalize. While goal is 35 – 45 mm Hg avoid hyperventilation.**
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiac catherterization and intensive care service.**
- Most patients immediately post resuscitation will require ventilatory assistance.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with medical control.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Titrate Dopamine or other vasopressors to maintain SAP ≥ 90. Ensure adequate fluid resuscitation is ongoing.

# Induced Hypothermia (~~Optional~~)

NCCEP

NORTH CAROLINA OEMS OFFICE of EMS

## History
- Non-traumatic cardiac arrests (drownings and hanging / asphyxiation are permissible in this protocol.)
- All presenting rhythms are permissible in this protocol
- Age 18 or greater

## Signs and Symptoms
- Cardiac arrest
- Return of Spontaneous Circulation post-cardiac arrest

## Differential
- Continue to address specific differentials associated with the arrhythmia

Return of Spontaneous Circulation ROSC

Criteria for Induced Hypothermia
Initial rectal temperature
**≥ 93.2 F (34C)**

NO → Exit to Post Resuscitation Protocol

YES ↓

Consider Intra-arrest cooling Per Agency Medical Director

| | |
|---|---|
| B | **Advanced Airway (includes BIAD) in place** with EtCO2 > 20 mmHg |
| | Perform Neurological Assessment |
| | Expose and apply ice packs to axilla and groin areas |
| I | **Cold Normal Saline Bolus 30 mL/kg IV / IO Maximum 2 L** |
| P | **Dopamine 5 – 20 mcg/kg/min IV / IO** Titrate to SBP ≥ 90 |

NO → Airway Protocol(s) ***as indicated***

May substitute a variety of commercially available cooling devices Per Agency Medical Director

Reassess Rectal Temperature
**Target: 91.4 F (33C)**
***(Range 89.6 F to 93.3 F)***
***( Range 32 – 34C)***

≤ 91.4 F (33 C) → Stop cooling measures Until temperature increases

Reassess temperature every 10 minutes

Continue Post Resuscitation Care

≥ 92 F (33.3 C) → Continue Cooling → Exit to Post Resuscitation Protocol

Shivering noted

NO → Exit to Post Resuscitation Protocol

YES ↓

P

Continued Shivering

NO → Exit to Post Resuscitation Protocol

YES ↓

P **Midazolam 1 - 2 mg IV / IO**
May repeat in 5 minutes if needed
And / Or
**Fentanyl 50 – 100 mcg IV / IO bolus**
May repeat 50 mcg every 5 minutes as needed
**Maximum 200 mcg**

P

**Notify Destination or Contact Medical Control**

Agencies utilizing cerebral cooling devices are unlikely to see a change in rectal temperature during transport.

Continued temperature assessment not warranted with these devices. Document initial temperature

Adult Cardiac Section Protocols

# Induced Hypothermia (~~Optional~~)

PEARLS:

* This protocol is considered a required, non-optional protocol in Pitt County.



**Pearls**

- **Criteria for Induced Hypothermia:**
  - **Return of spontaneous circulation not related to blunt / penetrating trauma or hemorrhage.**
  - **Temperature greater than 93 degrees (34 C).**
  - **Advanced airway (including BIAD) in place with no purposeful response to verbal commands.**
- **Do not delay transport to initiate induced hypothermia.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.**
- **Initial End tidal CO2 may be elevated immediately post-resuscitation but will usually normalize. While goal is 35 – 45 mm Hg avoid hyperventilation.**
- **Utilization of this protocol mandates transport to facility capable of managing the post-arrest patient and continuation of induced hypothermia therapy.**
- If no advanced airway in place obtained, cooling may only be initiated on order from medical control.
- Maintain patient modesty. Undergarments may remain in place during cooling.
- Monitor advance airway frequently, especially after any movement of patient.

# Team Focused CPR (Optional)

**Criteria for Death / No Resuscitation**
**Review DNR / MOST Form**

**YES**

Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

**NO**

**Begin Continuous CPR Compressions**
**Push Hard (≥ 2 inches) Push Fast (≥ 100 / min)**
**Change Compressors every 2 minutes**
**(*Limit changes / pulses checks ≤ 10 seconds*)**

**First Arriving BLS / ALS Responder**
**Initiate Compressions Only CPR**
Initiate Defibrillation Automated Procedure
***if available***
Call for additional resources

**Second Arriving BLS / ALS Responder**
Assume Compressions or
Initiate Defibrillation Automated / Manual Procedure
Place BIAD
DO NOT Interrupt Compressions
Ventilate at 6 to 8 breaths per minute

**Third Arriving Responder**
**BLS or ALS**

**BLS**

**Establish Team Leader**
(Hierarchy)
Fire Department or Squad Officer
EMT-B
First Arriving Responder

**Rotate with Compressor**
To prevent Fatigue and effect high quality compressions
Take direction from Team Leader

**Fourth / Subsequent Arriving Responders**
Take direction from Team Leader

**Continue Cardiac Arrest Protocol**

**ALS**

**I**

**Establish Team Leader**
(Hierarchy)
EMS ALS Personnel
Fire Department or Squad Officer
EMT-B
First Arriving Responder

Initiate Defibrillation Automated Procedure
Establish IV / IO
Administer Appropriate Medications
Establish Airway with BIAD if not in place

**P**

Initiate Defibrillation Manual Procedure
Continuous Cardiac Monitoring
Establish IV / IO
Administer Appropriate Medications
Establish Airway with BIAD if not in place

**Continue Cardiac Arrest Protocol**

**Utilize this Protocol with**

**Cardiac Arrest Protocol**

**AT ANY TIME**

**Return of Spontaneous Circulation**

**Go to Post Resuscitation Protocol**

**Team Leader**
ALS Personnel
Responsible for patient care
Responsible for briefing / counseling family

**Incident Commander**
Fire Department / First Responder Officer
Team Leader until ALS arrival
Manages Scene / Bystanders
Ensures high-quality compressions
Ensures frequent compressor change
Responsible for briefing family prior to ALS arrival

# Team Focused CPR (Optional)



**Pearls**

- **This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute.**
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.

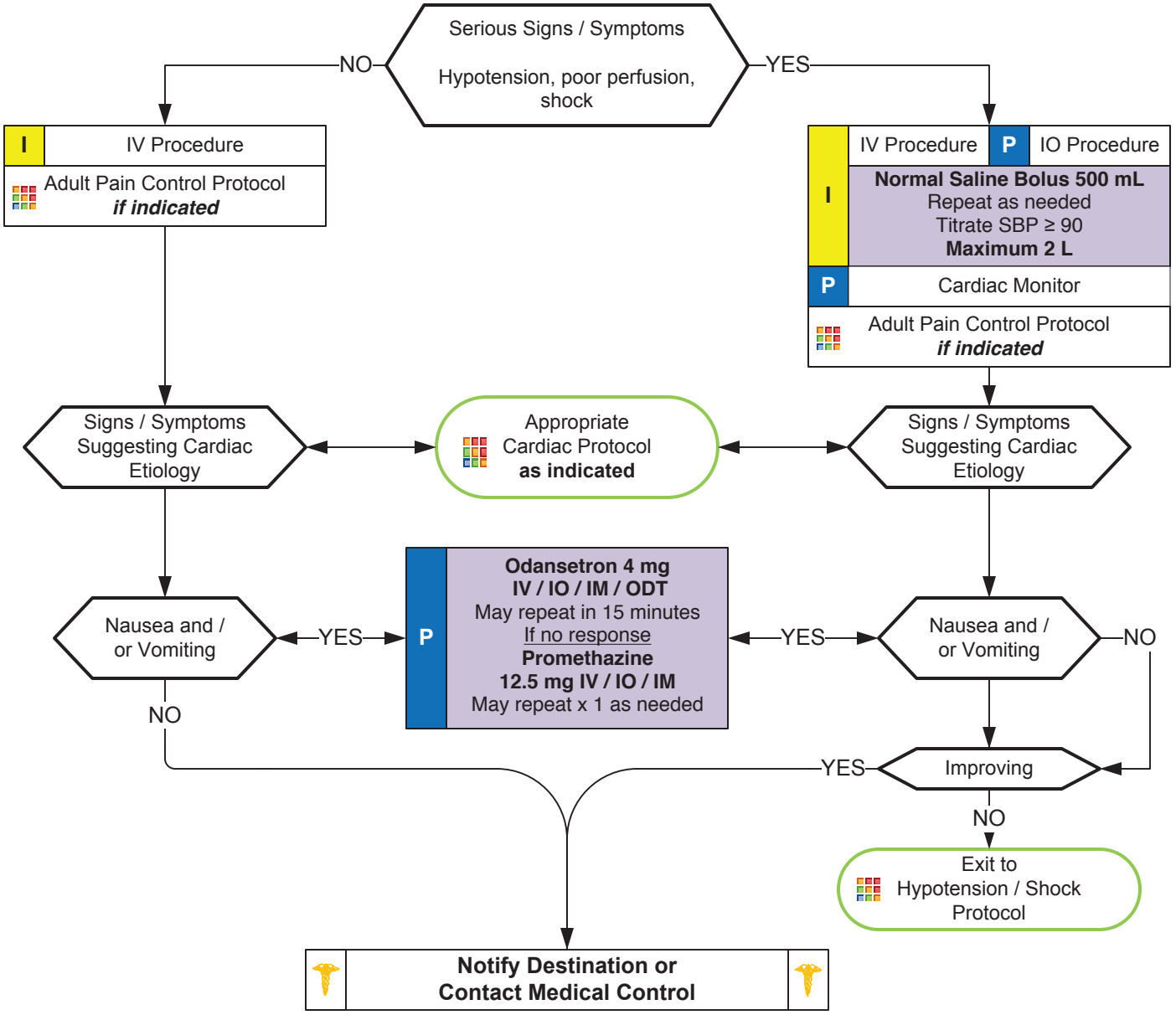
# Abdominal Pain

## History
- Age
- Past medical / surgical history
- Medications
- Onset
- Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (1-10)
- Time (duration / repetition)
- Fever
- Last meal eaten
- Last bowel movement / emesis
- Menstrual history (pregnancy)

## Signs and Symptoms
- Pain (location / migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation
- Vaginal bleeding / discharge
- Pregnancy

**Associated symptoms:**
**(Helpful to localize source)**
Fever, headache, weakness, malaise, myalgias, cough, headache, mental status changes, rash

## Differential
- Pneumonia or Pulmonary embolus
- Liver (hepatitis, CHF)
- Peptic ulcer disease / Gastritis
- Gallbladder
- Myocardial infarction
- Pancreatitis
- Kidney stone
- Abdominal aneurysm
- Appendicitis
- Bladder / Prostate disorder
- Pelvic (PID, Ectopic pregnancy, Ovarian cyst)
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)
- Ovarian and Testicular Torsion




Adult Medical Section Protocols

# Abdominal Pain





## Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neuro**
- Document the mental status and vital signs prior to administration of anti-emetics
- Abdominal pain in women of childbearing age should be treated as pregnancy related until proven otherwise.
- Antacids should be avoided in patients with renal disease.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain especially in patients over 50 and / or patients with shock/ poor perfusion.
- Repeat vital signs after each fluid bolus.
- The use of metoclopramide (Reglan) may worsen diarrhea and should be avoided in patients with this symptom.
- Choose the lower dose of promethazine (Phenergan) for patients likely to experience sedative effects (e.g., Age ≥ 60, debilitated, etc.) When giving promethazine IV dilute with 10 mL of normal saline and administer slowly.
- Consider cardiac etiology in patients > 50, diabetics and / or women especially with upper abdominal complaints.

# Allergic Reaction / Anaphylaxis

## History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

## Signs and Symptoms
- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- N/V

## Differential
- Urticarial (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

Assess Symptom Severity

### MILD

| | |
|---|---|
| B | **Diphenhydramine 25 - 50 mg PO** |
| I | IV Procedure ***if indicated*** |
| I | **Diphenhydramine 25 - 50 mg PO / IV / IM / IO** |
| I | **Famotidine 20 mg IV** *If available* |
| B | Monitor and Reassess Monitor for Worsening Signs and Symptoms |

### MODERATE

| | |
|---|---|
| | **Epinephrine 1:1000 Auto-Injector IM** ***if available*** |
| B | **Diphenhydramine 25 - 50 mg PO** |
| B | **Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3 ***if indicated*** |
| I | **Epinephrine 1:1000 0.3 – 0.5 mg IM** Repeat in 5 minutes if no improvement |
| I | IV Procedure |
| I | **Diphenhydramine 25 - 50 mg IV / IM / IO** ***if not already given PO*** |
| I | **Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated*** |
| I | *** Famotidine 20 mg IV** *If available* |
| P | **Methylprednisolone 125 mg IV / IO** |

### SEVERE

| | |
|---|---|
| | **Epinephrine 1:1000 Auto-Injector IM** ***if available*** |
| B | **Diphenhydramine 25 - 50 mg PO** |
| B | **Albuterol 2.5 – 5 mg** Nebulizer Repeat as needed x 3 ***if indicated*** |
| | Airway Protocol(s) ***if indicated*** |
| I | **Epinephrine 1:1000 0.3 – 0.5 mg IM** Repeat in 5 minutes if no improvement |
| I | IV Procedure / P / IO Procedure |
| I | **Diphenhydramine 25 - 50 mg IV / IM / IO** if not already given |
| I | **Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated*** |
| I | **Normal Saline Bolus 500 mL IV / IO** Repeat as needed **Maximum 2 Liters** |
| I | **Famotidine 20 mg IV** *If available* |
| P | **Methylprednisolone 125 mg IV / IO** |

Cardiac Monitoring Indicated for Moderate and Severe Reactions

**Notify Destination or Contact Medical Control**

Adult Medical Protocol Section

# Allergic Reaction / Anaphylaxis



PEARLS:

* EMT-I/EMT-P: May administer the Histamine (H2) Blocker, Famotidine (Pepcid) 20 mg IV or 20 - 40 mg PO (adult dose).

* MR / EMT-B may administer Epinephrine IM as auto-injector only and may administer from EMS supply. Medical Director does not require medical control contact prior to administering any medication.
* EMT-B may administer diphenhydramine by oral route only and may administer from EMS supply. Medical Director does not require medical control contact prior to administering any medication.
* EMT-B may administer Albuterol only if patient already prescribed and may administer from EMS supply. Medical Director does not require medical control contact prior to administering any medication.



## Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for appropriate dosing.**
- **Symptom Severity Classification:**
  - **Mild symptoms:**
    - **Flushing, hives, itching, erythema with normal blood pressure and perfusion.**
  - **Moderate symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.**
  - **Severe symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion.**
- **Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.**
- **Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.**
- **Patients who are ≥ 50 years of age, have a history of cardiac disease, take Beta-Blockers / Digoxin or patient's who have heart rates ≥ 150 give one-half the dose of epinephrine (0.15 – 0.25 mg of 1:1000.) Epinephrine may precipitate cardiac ischemia. These patients should receive a 12 lead ECG at some point in their care, but this should NOT delay administration of epinephrine.**
- **MR / EMT-B may administer Epinephrine IM as Auto-injector only and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to MR / EMT-B administering any medication.
- **EMT-B may administer diphenhydramine by oral route only and may administer from EMS supply**. Agency Medical Director may require contact of medical control prior to EMT-B / MR administering any medication.
- **EMT-B may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMT-B / MR administering any medication.
- Any patient with respiratory symptoms or extensive reaction should receive IV or IM diphenhydramine.
- The shorter the onset from symptoms to contact, the more severe the reaction.

# Altered Mental Status

## History
- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleep habits

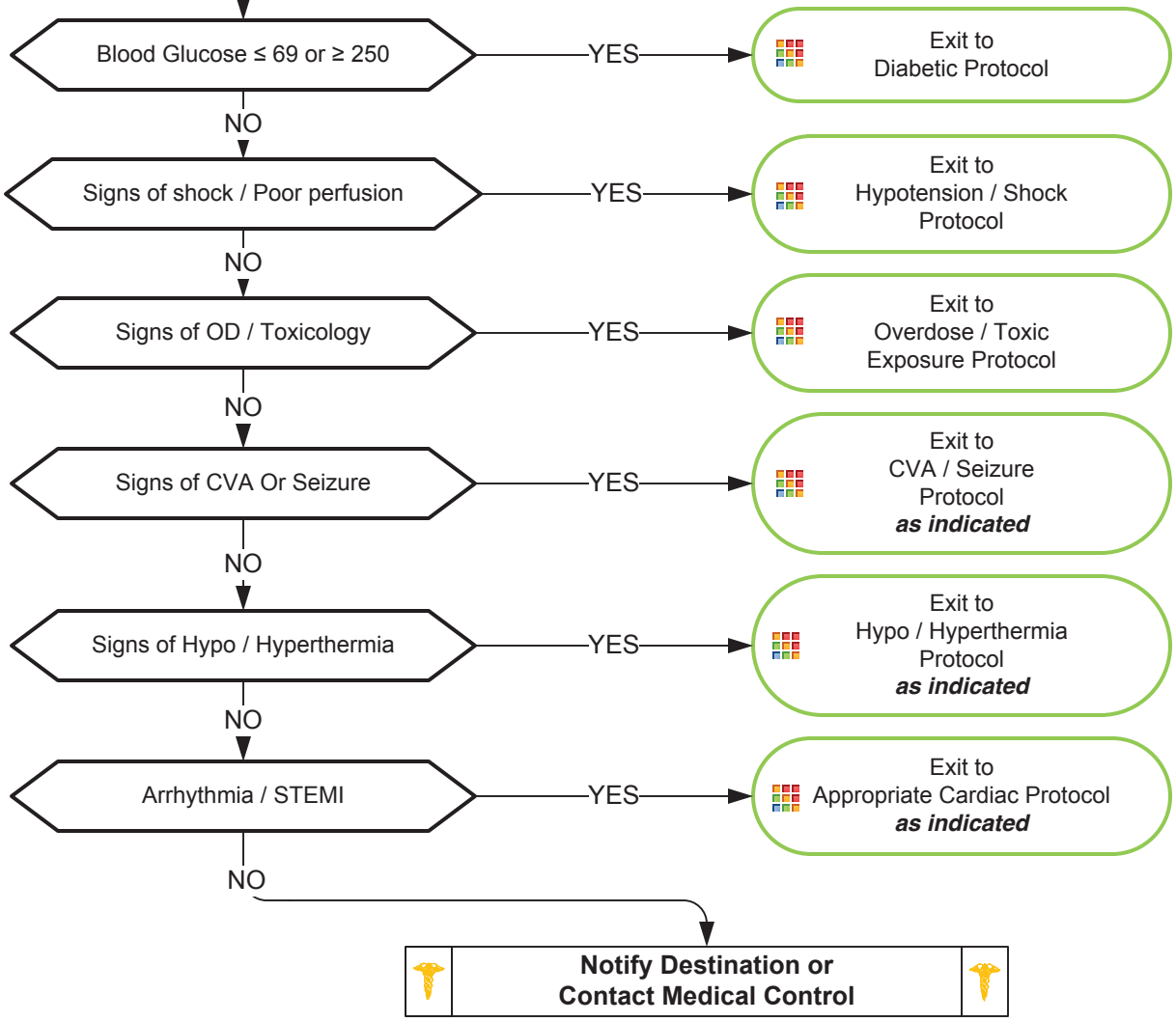
## Signs and Symptoms
- Decreased mental status or lethargy
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

## Differential
- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection (CNS and other)
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological or Ingestion
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

Airway Protocol(s) ***if indicated***

| | |
|---|---|
| | Blood Glucose Analysis Procedure |
| B | 12 Lead ECG Procedure |
| I | IV Procedure / P IO Procedure |

Utilize Spinal Immobilization Protocol where circumstances suggest a mechanism of injury.



# Altered Mental Status





**Pearls**

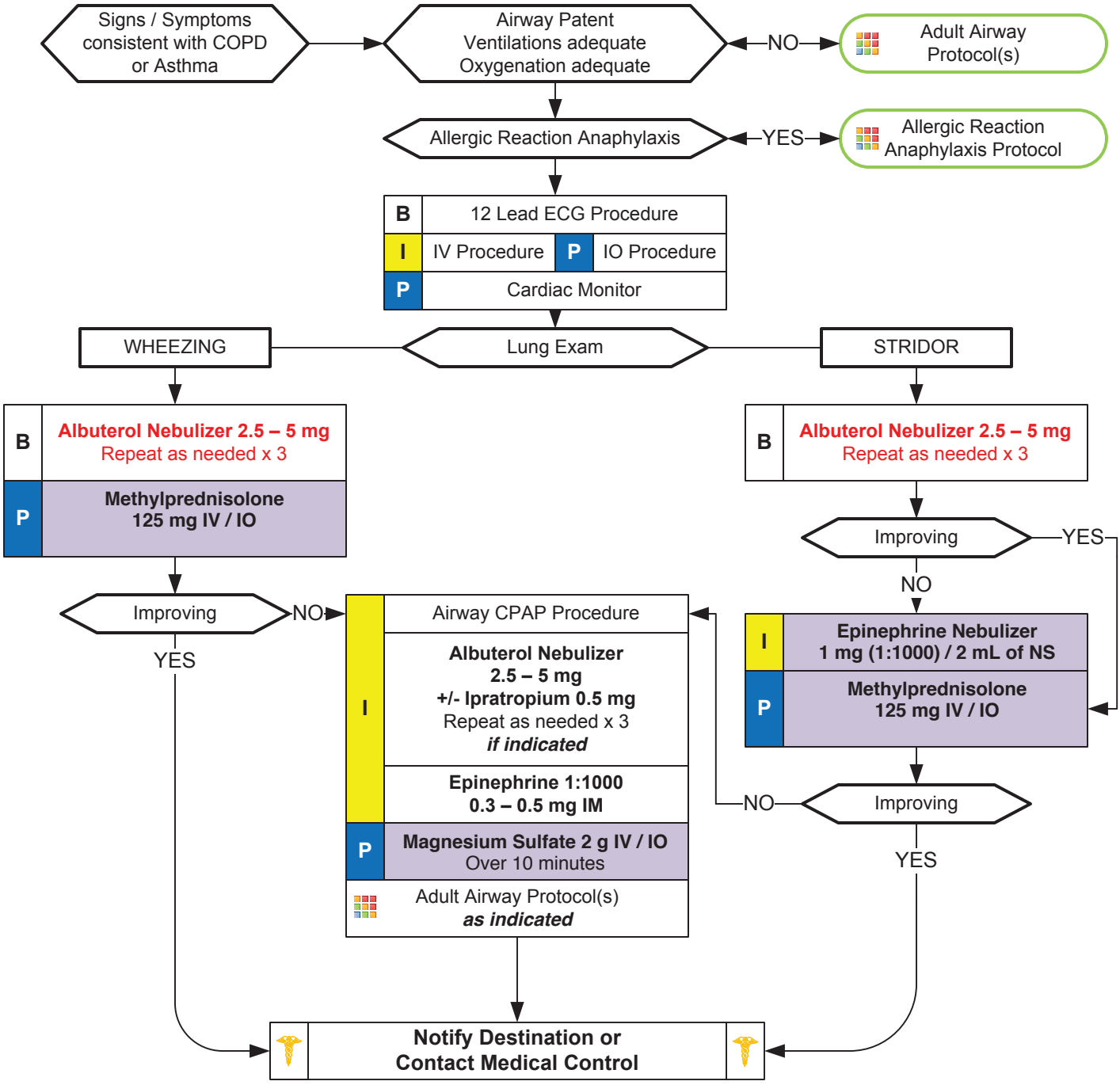
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.**
- **Pay careful attention to the head exam for signs of bruising or other injury.**
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and may have unrecognized injuries.
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.

# Adult COPD / Asthma

## History
- Asthma; COPD -- chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

## Signs and Symptoms
- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Fever, cough
- Tachycardia

## Differential
- Asthma
- Anaphylaxis
- Aspiration
- COPD (Emphysema, Bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI or CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (Carbon monoxide, etc.)




Adult Medical Section Protocols

# Adult COPD / Asthma



PEARLS:

* EMT-B may administer Albuterol "only" if patient already prescribed and may administer from EMS supply. Medical Director does not require medical control contact prior to administration.



## Pearls

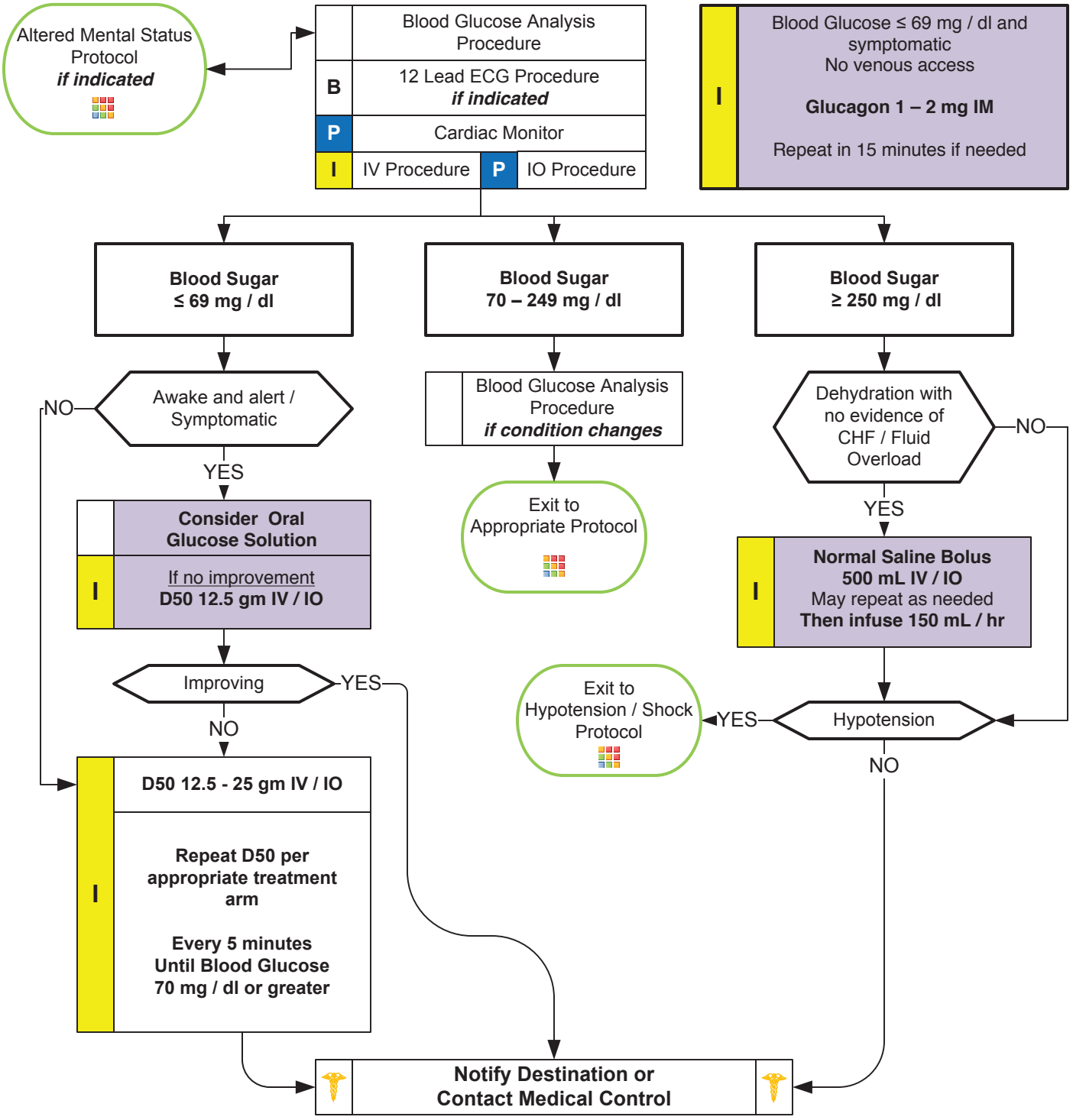
- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Patients who are ≥ 50 years of age, have a history of cardiac disease, take Beta-Blockers / Digoxin or patient's who have heart rates ≥ 150 give one-half the dose of epinephrine (0.15 – 0.25 mg of 1:1000.) Epinephrine may precipitate cardiac ischemia. These patients should receive a 12 lead ECG at some point in their care, but this should NOT delay administration of epinephrine.**
- **Pulse oximetry should be monitored continuously.**
- ETCO2 should be used when Respiratory Distress is significant and does not respond to initial Beta-Agonist dose.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **EMT-B may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.

# Diabetic; Adult

## History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

## Signs and Symptoms
- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

## Differential
- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.




Adult Medical Section Protocols

# Diabetic; Adult





## Pearls

- **Recommended exam: Mental Status, Skin, Respirations and effort, Neuro.**
- Patients with prolonged hypoglycemia my not respond to glucagon.
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- In extreme circumstances with no IV and no response to glucagon, Dextrose 50 % can be administered rectally. Contact medical control for advice.
- Quality control checks should be maintained per manufacturers recommendation for all glucometers.
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
- **Oral Agents:**

  Patient's taking oral diabetic medications should be strongly encouraged to allow transportation to a medical facility. They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established. Not all oral agents have prolonged action so Contact Medical Control for advice. Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Insulin Agents:**

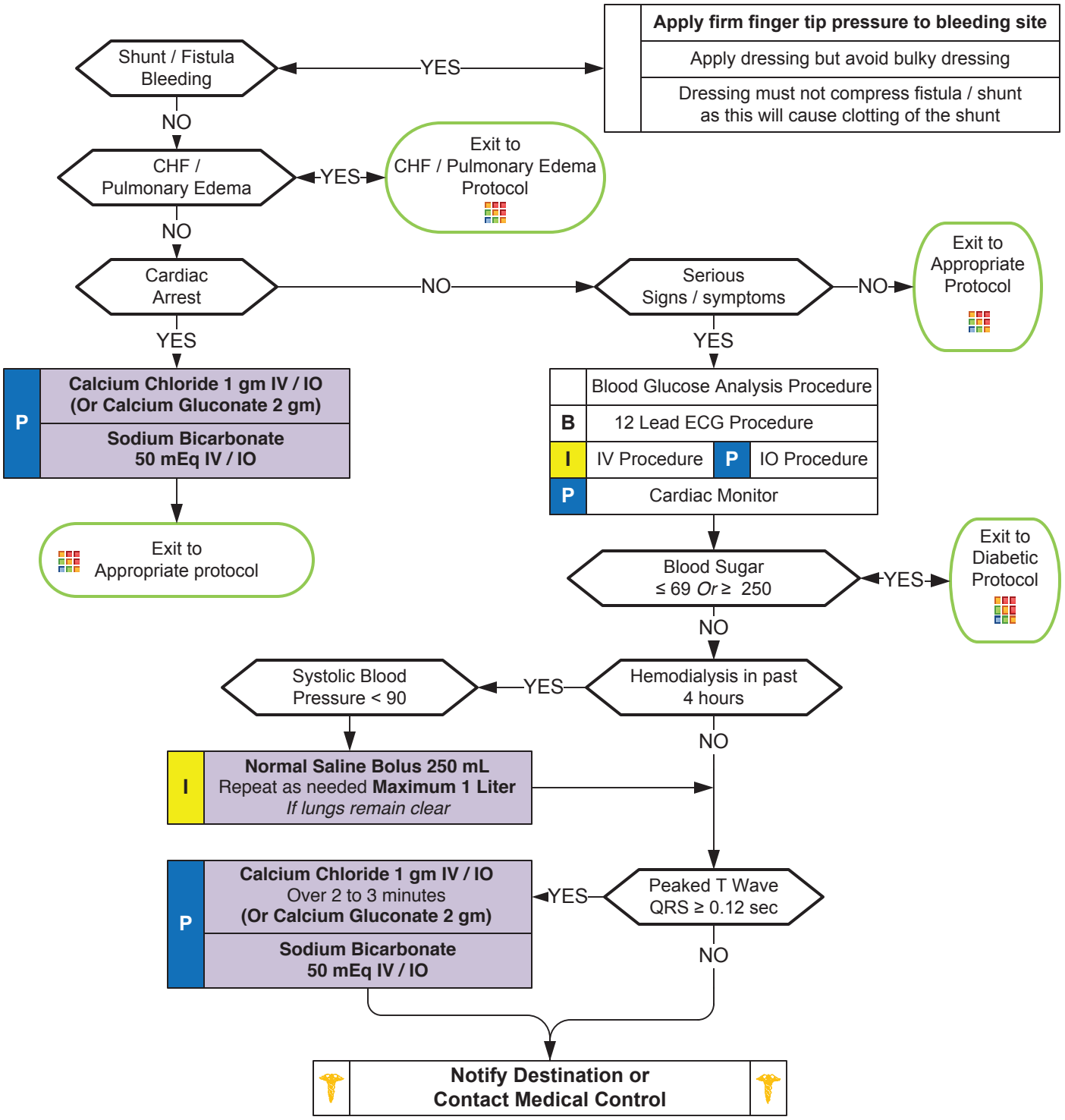
  Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established. Not all insulins have prolonged action so Contact Medical Control for advice. Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.

# Dialysis / Renal Failure

## History
- Peritoneal or Hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

## Signs and Symptoms
- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea and / or vomiting
- Altered Mental Status
- Seizure
- Arrhythmia

## Differential
- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade




Adult Medical Section Protocols

# Dialysis / Renal Failure





**Pearls**

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **Do not take Blood Pressure or start IV in extremity which has a shunt / fistula in place.**
- **Access of shunt indicated in the dead or near-dead patient only with no other available access. IO if available.**
- **Use of tourniquet with uncontrolled dialysis fistula bleeding requires Contact of Medical Control.**
- Always consider Hyperkalemia in all dialysis or renal failure patients.
- Sodium Bicarbonate and Calcium Chloride / Gluconate should not be mixed. Ideally give in separate lines.
- Renal dialysis patients have numerous medical problems typically. Hypertension and cardiac disease are prevalent.

# Hypertension

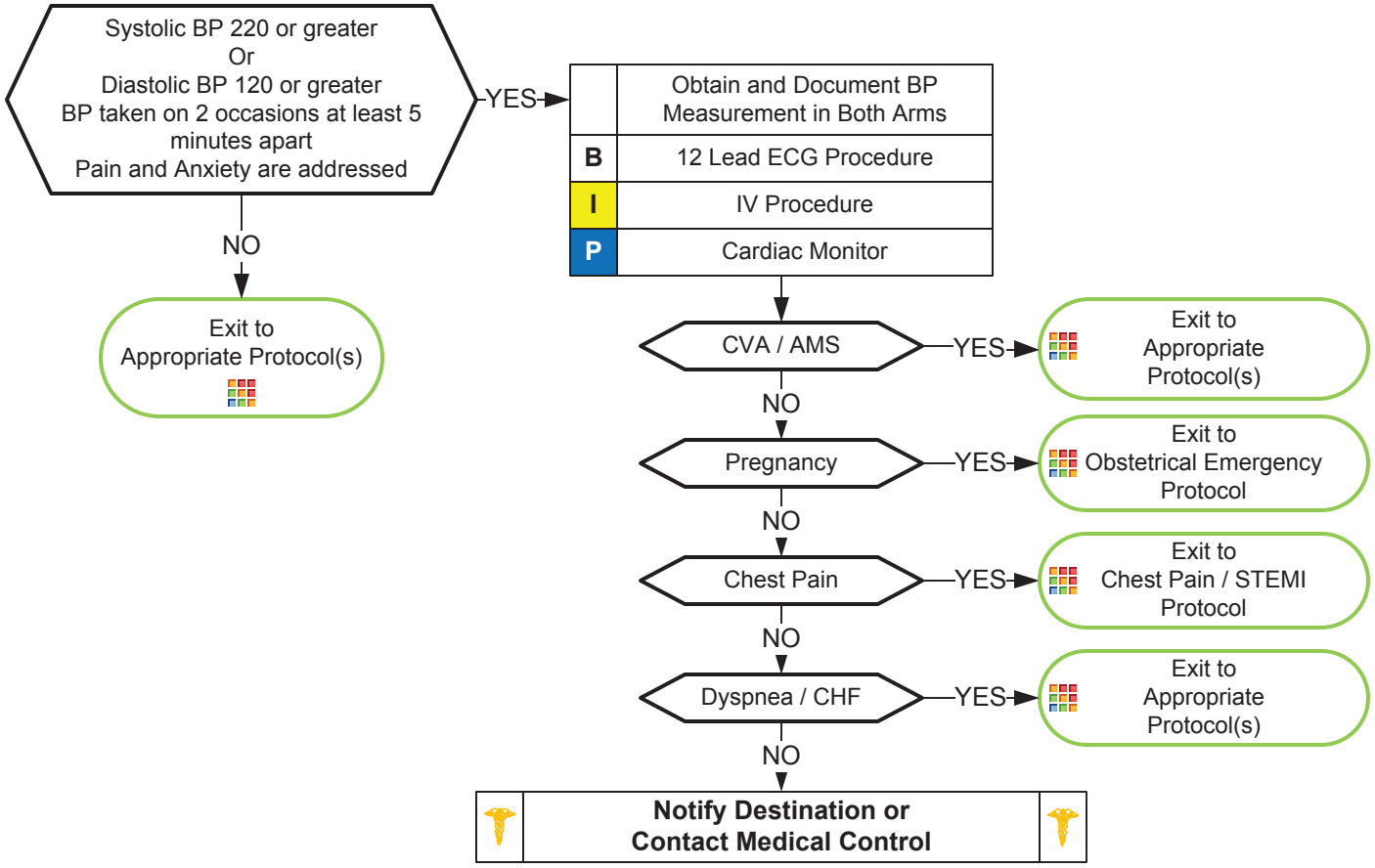
## History
- Documented Hypertension
- Related diseases: Diabetes; CVA; Renal Failure; Cardiac Problems
- Medications for Hypertension
- Compliance with Hypertensive Medications
- Erectile Dysfunction medications
- Pregnancy

## Signs and Symptoms
**One of these**
- Systolic BP 220 or greater
- Diastolic BP 120 or greater

**AND at least one of these**
- Headache
- Chest Pain
- Dyspnea
- Altered Mental Status
- Seizure

## Differential
- Hypertensive encephalopathy
- Primary CNS Injury
  - Cushing's Response with Bradycardia and Hypertension
- Myocardial Infarction
- Aortic Dissection / Aneurysm
- Pre-eclampsia / Eclampsia

Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on specific protocols and consultation with Medical Control.



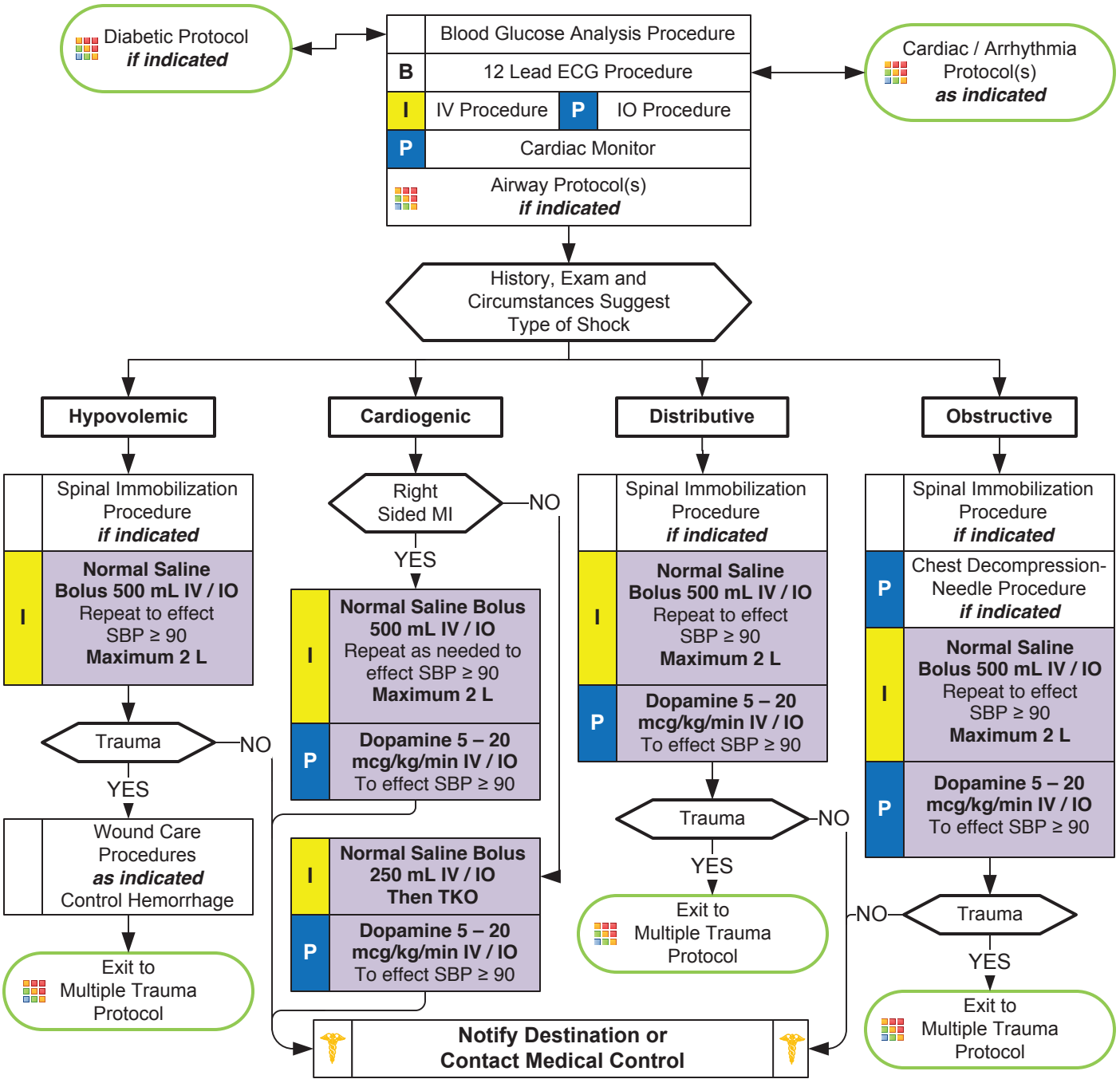

## Pearls
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Elevated blood pressure is based on two to three sets of vital signs.
- Symptomatic hypertension is typically revealed through end organ dysfunction to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated at 30 degrees.
- Ensure appropriate size blood pressure cuff utilized for body habitus.

# Hypotension / Shock

## History
- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

## Signs and Symptoms
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

## Differential
- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)




Adult Medical Section Protocols

# Hypotension / Shock



## Pearls

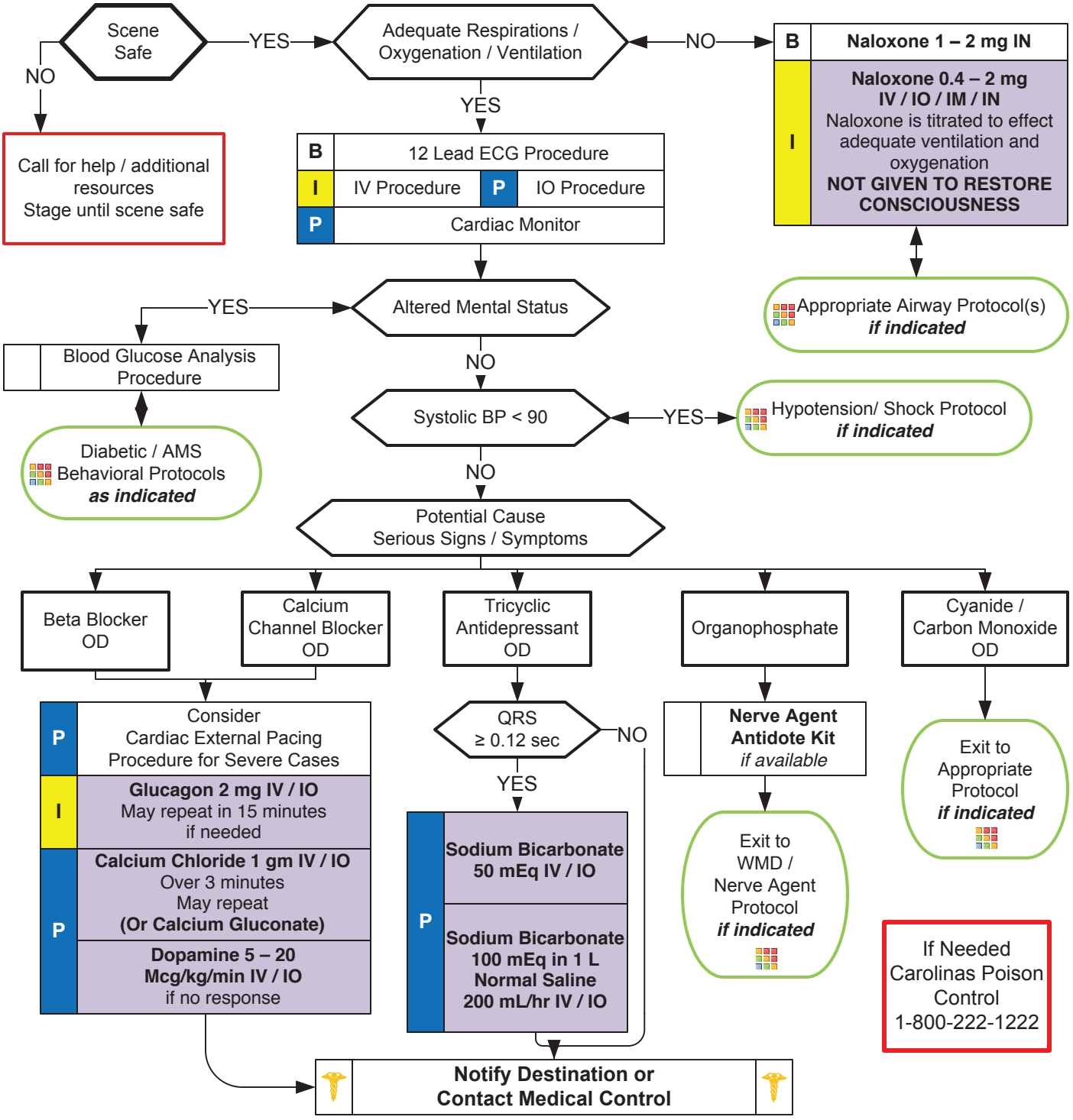
- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Hypotension can be defined as a systolic blood pressure of less than 90. This is not always reliable and should be interpreted in context and patients typical BP if known. Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Hypovolemic Shock;**
  Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
- **Cardiogenic Shock:**
  Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical / septum / valve / toxins.
- **Distributive Shock:**
  Sepsis
  Anaphylactic
  Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
  Toxins
- **Obstructive Shock:**
  Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
  Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency:** State where body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary adrenal disease or more commonly have stopped a steroid like prednisone. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. If suspected EMT-P should give Methylprednisolone 125 mg IV / IO or Dexamethasone 10 mg IV / IO. May use steroid agent specific to your drug list.
- For non-cardiac, non-trauma hypotension, Dopamine should only be started after 2 liters of NS have been given.

# Overdose / Toxic Ingestion

## History
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

## Signs and Symptoms
- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S

## Differential
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)




Adult Medical Section Protocols

# Overdose / Toxic Ingestion



PEARLS:

*EMT-B may administer Naloxone by IN route only. May administer from EMS supply. Medical Director does not require medical control contact prior to administration.



## Pearls

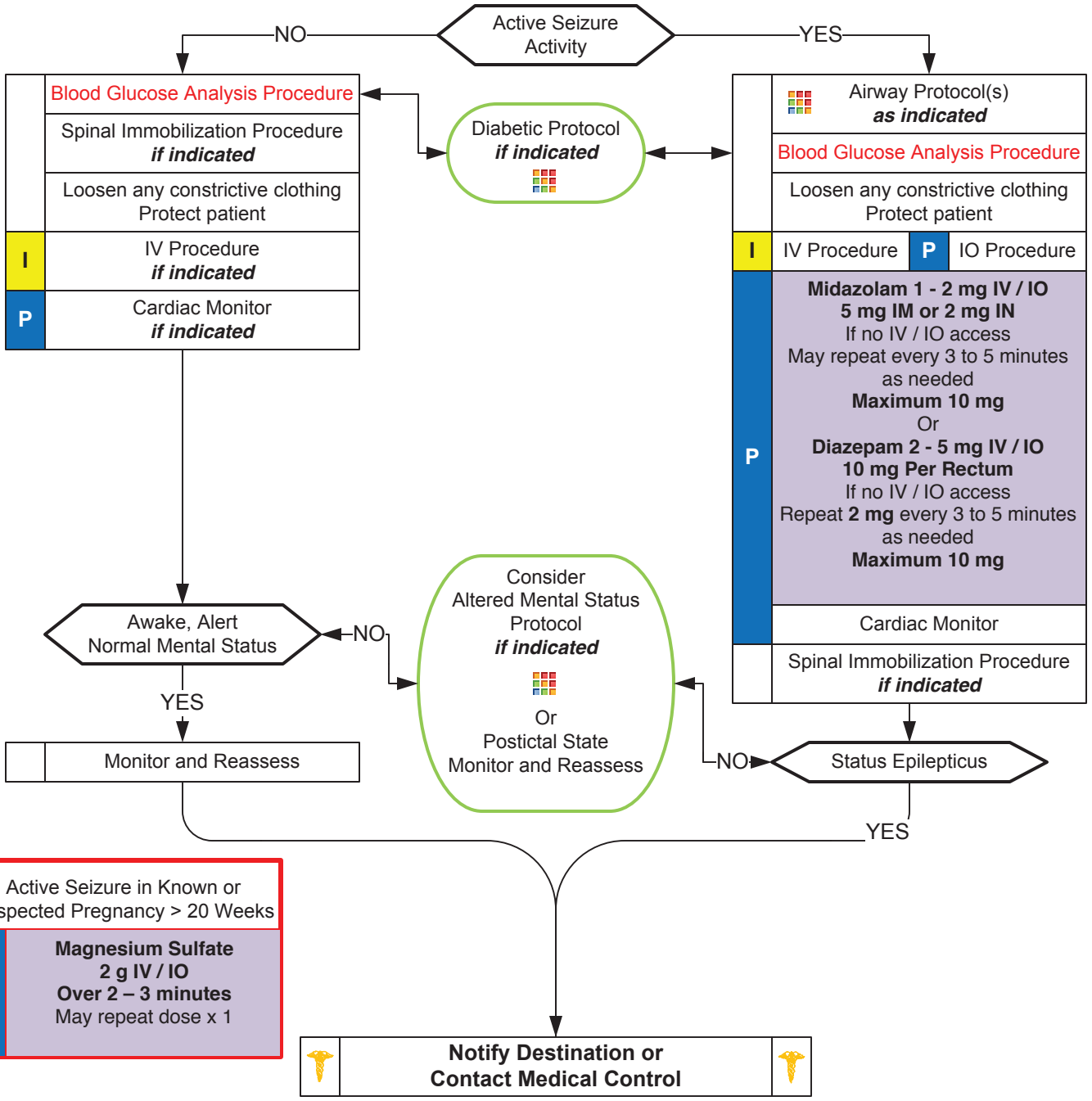
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons.**
- **Bring bottles, contents, emesis to ED.**
- **S.L.U.D.G.E: Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis**
- **D.U.M.B.B.E.L.S: Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.**
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin**: Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures
- **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- **EMT-B may administer naloxone by IN route only. May administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.
- **Consider contacting the North Carolina Poison Control Center for guidance.**

# Seizure

## History
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

## Signs and Symptoms
- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

## Differential
- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia




Adult Medical Section Protocols

# Seizure



**Pearls**

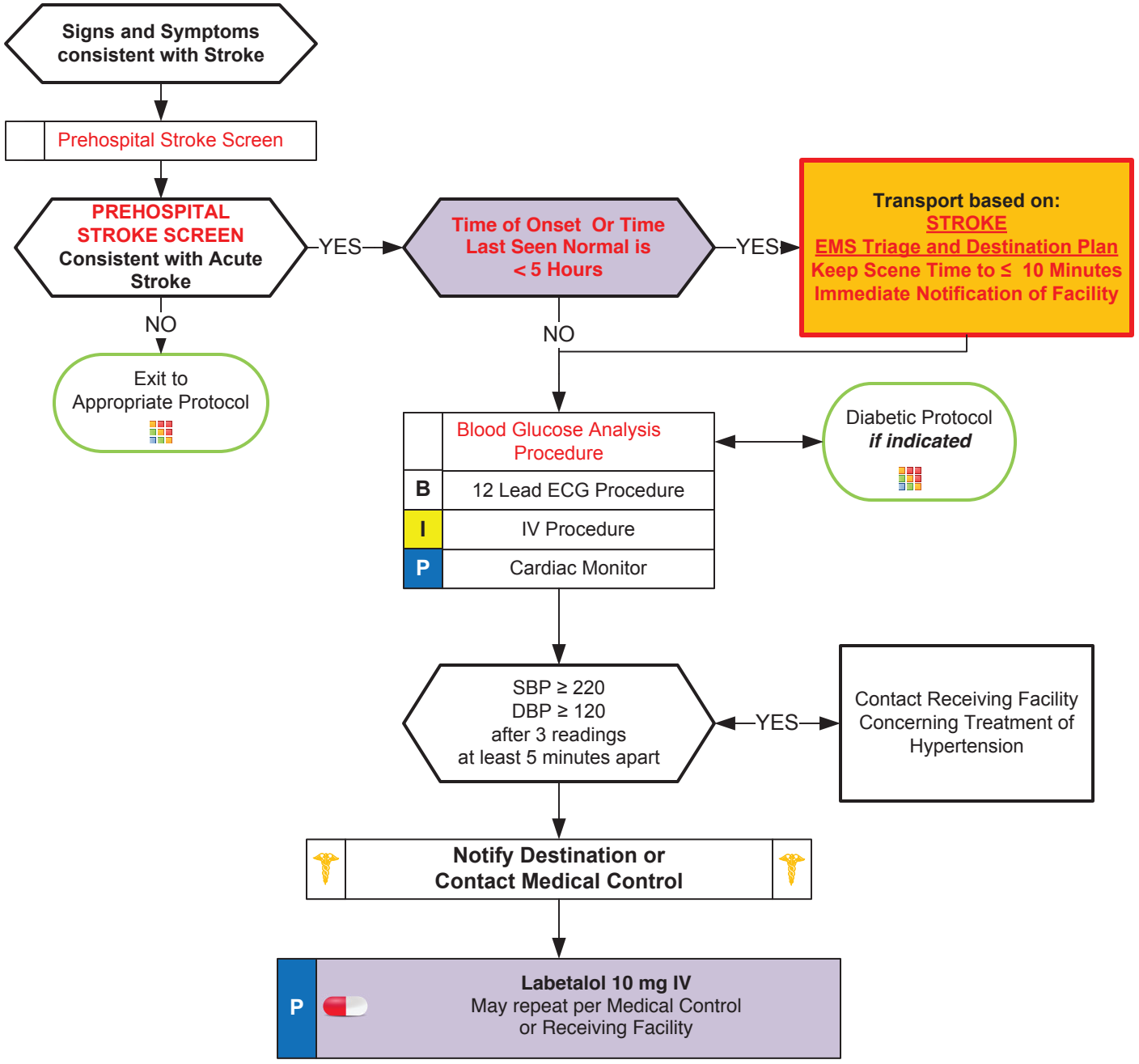
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures (petit mal)** effect only a part of the body and are not usually associated with a loss of consciousness
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations especially if diazepam or midazolam is used.
- For any seizure in a pregnant patient, follow the OB Emergencies Protocol.
- Diazepam (Valium) is not effective when administered IM. Give IV or Rectally. Midazolam is well absorbed when administered IM.

# Suspected Stroke

### History
- Previous CVA, TIA's
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

### Signs and Symptoms
- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

### Differential
- See Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Todd's Paralysis
- Hypoglycemia
- Stroke
  - Thrombotic or Embolic (~85%)
  - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / Renal Failure



# Suspected Stroke



PEARLS:

* Pitt County will utilize the "Cincinnati Stroke Score" as the prehospital stroke screen.



## Pearls

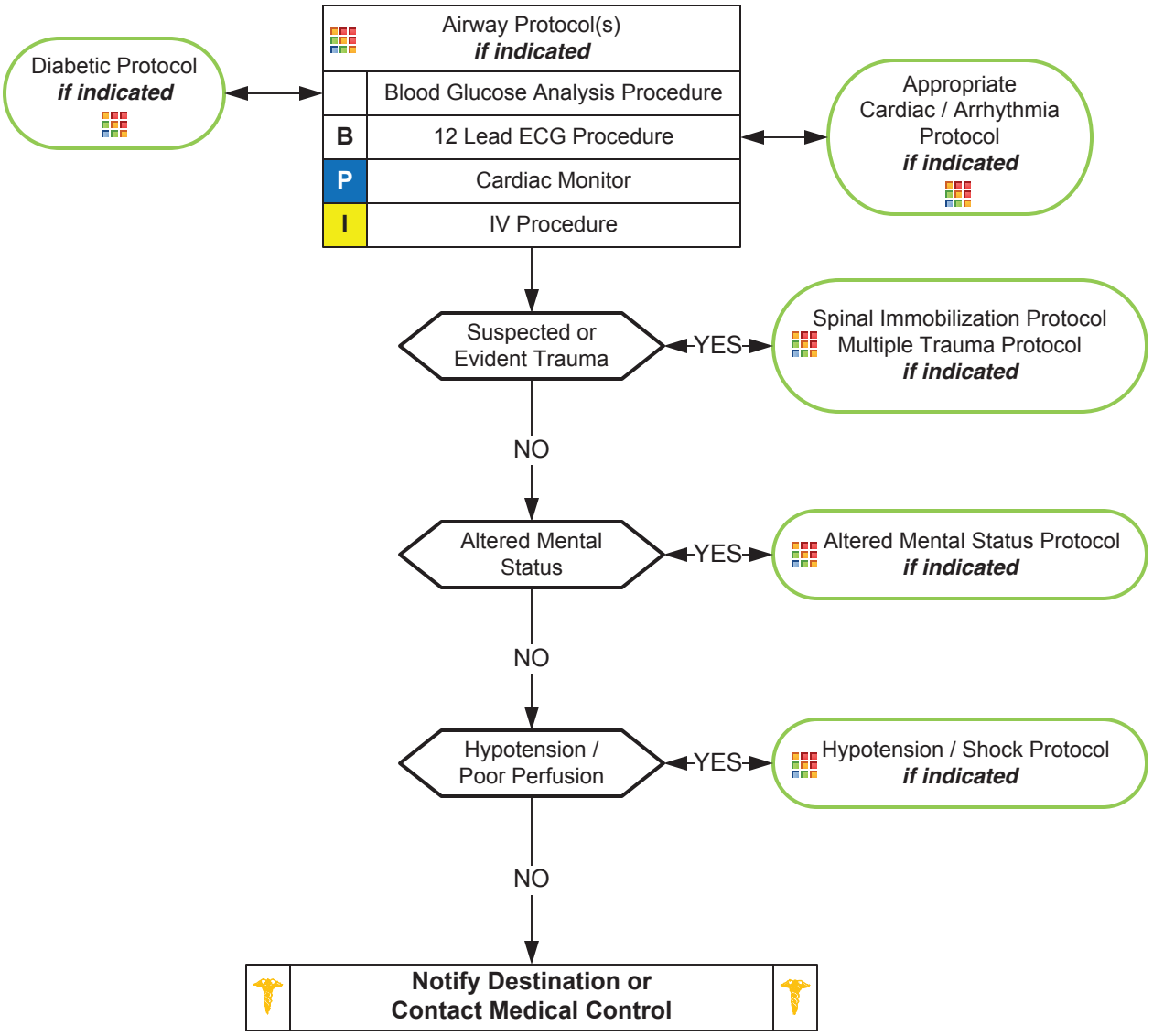
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Stroke Care Toolkit.**
- **Acute Stroke care is evolving rapidly. Time of onset / last seen normal may be changed at any time depending on the capabilities and resources of your hospital based on Stroke: EMS Triage and Destination Plan.**
- **Time of Onset or Last Seen Normal: One of the most important items the pre-hospital provider can obtain, of which all treatment decisions are based. Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:47 NOT "about 45 minutes ago.") Without this information patient may not be able to receive thrombolytics at facility. Wake up stroke: Time starts when patient last awake.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient. With a duration of symptoms of less than** 5 HOURS **, scene times should be limited to ≤ 10 minutes, early notification / activation of receiving facility should be performed and transport times should be minimized.**
- **Onset of symptoms** is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time when the patient went to sleep or last time known to be symptom free.)
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- Document the Stroke Screen results in the PCR.
- Agencies may use validated pre-hospital stroke screen of choice.

# Syncope

## History
- Cardiac history, stroke, seizure
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications

## Signs and Symptoms
- Loss of consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

## Differential
- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicological (Alcohol)
- Medication effect (hypertension)
- PE
- AAA



# Syncope



**Pearls**

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Assess for signs and symptoms of trauma if associated or questionable fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- These patients should be transported.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.

# Vomiting and Diarrhea

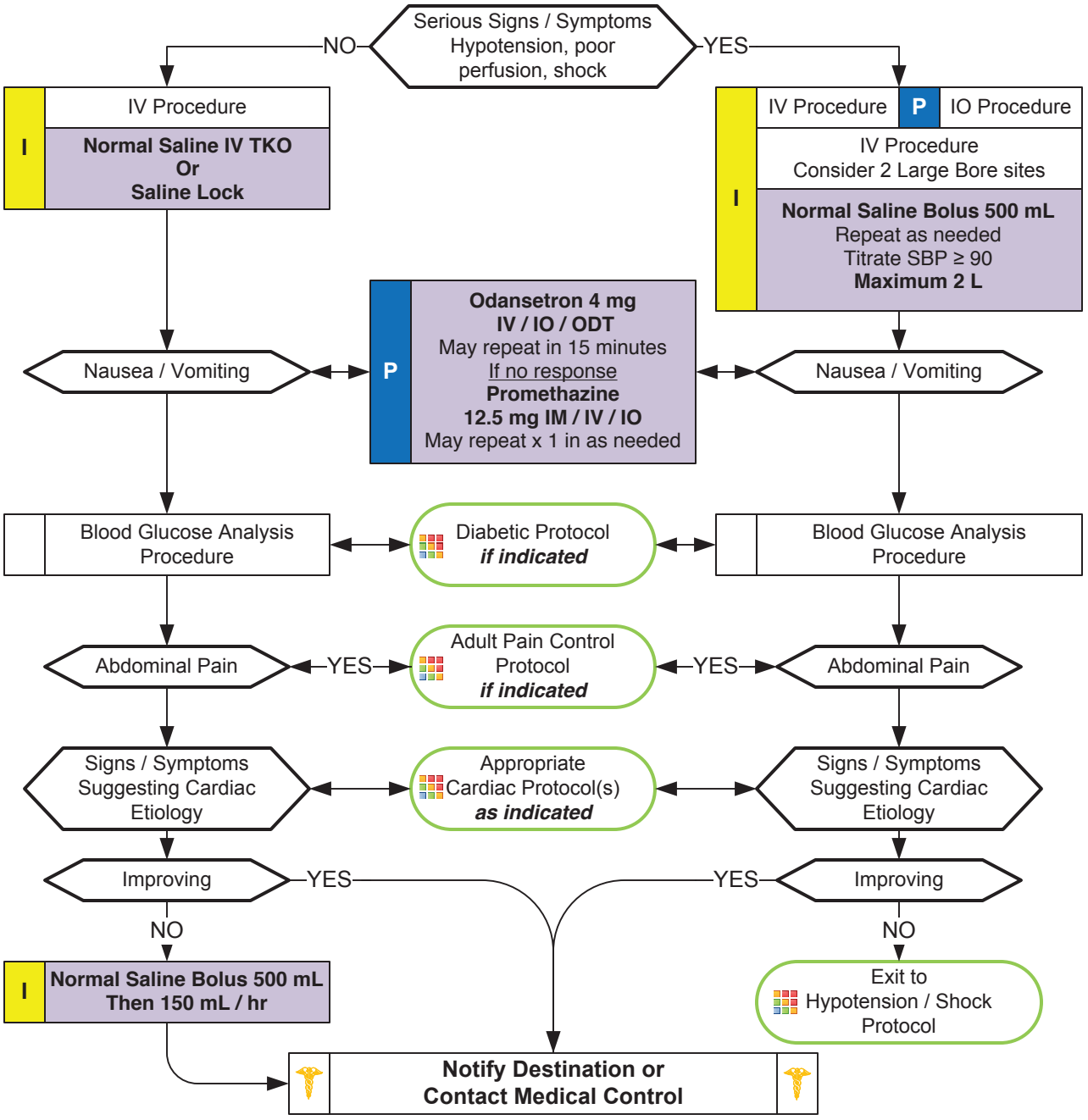
## History
- Age
- Time of last meal
- Last bowel movement/emesis
- Improvement or worsening with food or activity
- Duration of problem
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history (pregnancy)
- Travel history
- Bloody emesis / diarrhea

## Signs and Symptoms
- Pain
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

**Associated symptoms: (Helpful to localize source)**

Fever, headache, blurred vision, weakness, malaise, myalgias, cough, headache, dysuria, mental status changes, rash

## Differential
- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or Substance abuse
- Pregnancy
- Psychological




Adult Medical Section Protocols

# Vomiting and Diarrhea



**Pearls**

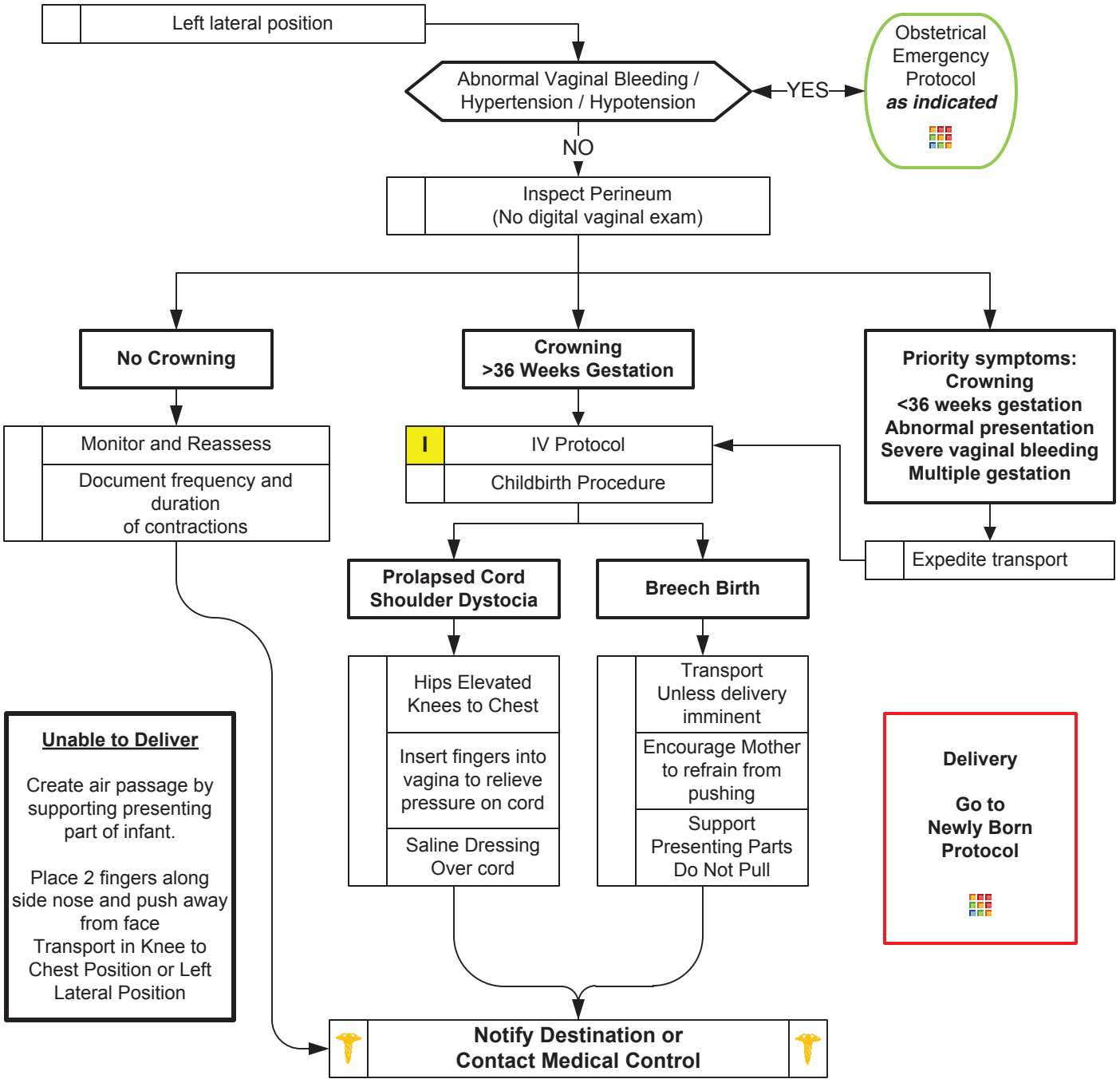
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- The use of metoclopramide (Reglan) may worsen diarrhea and should be avoided in patients with this symptom.
- Choose the lower dose of promethazine (Phenergan) for patients likely to experience sedative effects (e.g., Age ≥ 60, debilitated, etc.) When giving promethazine IV dilute with 10 mL of normal saline and administer slowly.
- Document the mental status and vital signs prior to administration of Promethazine (Phenergan).
- Isolated vomiting in pediatrics may be caused by pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures).

# Childbirth / Labor

## History
- Due date
- Time contractions started / how often
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para Status
- High Risk pregnancy

## Signs and Symptoms
- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

## Differential
- Abnormal presentation
  - Buttock
  - Foot
  - Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta




Adult Obstetrical Section Protocols

# Childbirth / Labor



**Pearls**

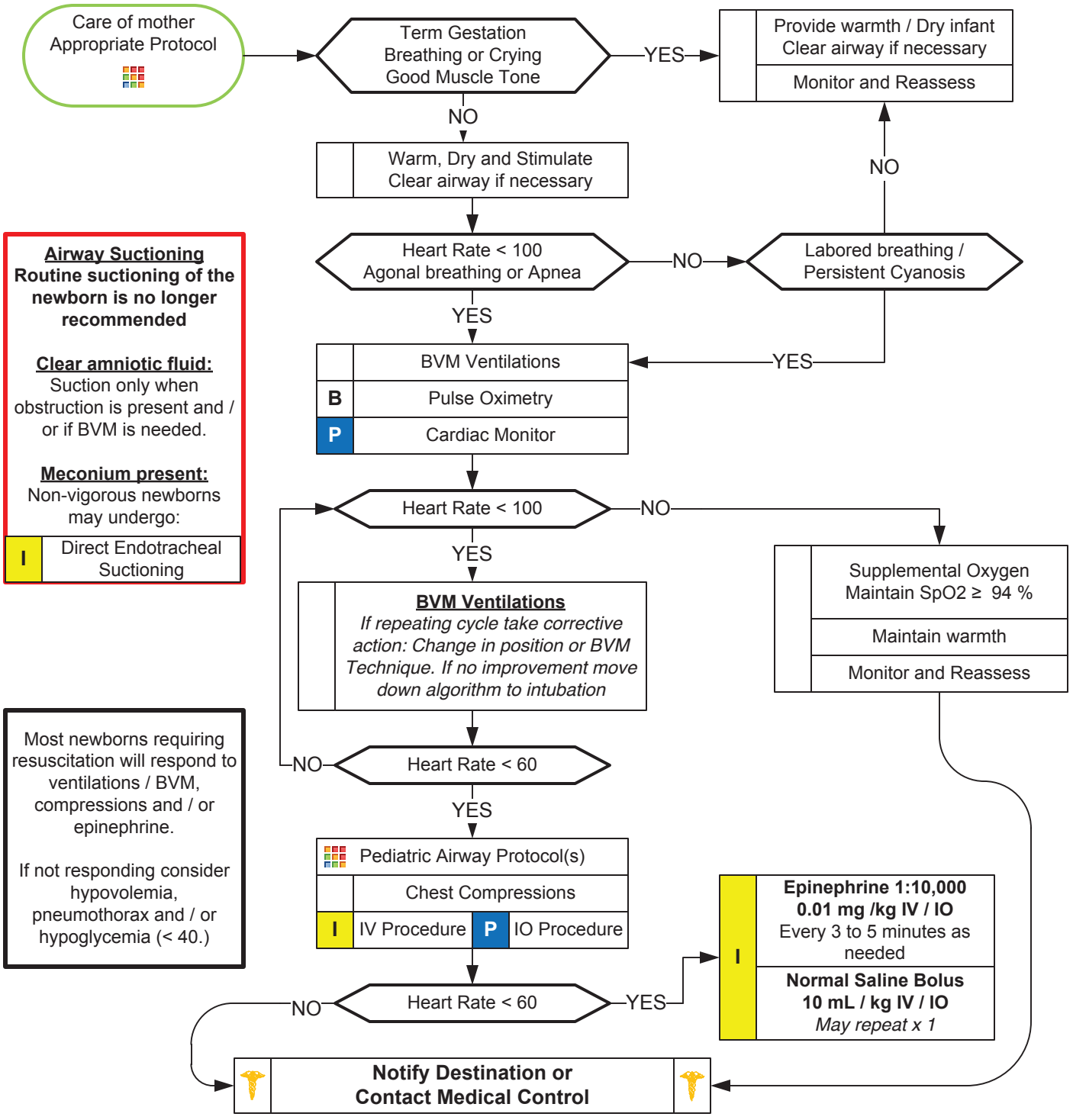
- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
- Document all times (delivery, contraction frequency, and length).
- If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.
- Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
- Record APGAR at 1 minute and 5 minutes after birth.

# Newly Born

## History
- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium
- Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors
  - substance abuse
  - smoking

## Signs and Symptoms
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

## Differential
- Airway failure
  - Secretions
  - Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia




**Airway Suctioning**
**Routine suctioning of the newborn is no longer recommended**

**Clear amniotic fluid:**
Suction only when obstruction is present and / or if BVM is needed.

**Meconium present:**
Non-vigorous newborns may undergo:

I — Direct Endotracheal Suctioning

Most newborns requiring resuscitation will respond to ventilations / BVM, compressions and / or epinephrine.

If not responding consider hypovolemia, pneumothorax and / or hypoglycemia (< 40.)

Adult Obstetrical Section Protocols

# Newly Born





**Pearls**

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- **Term gestation, strong cry / breathing and with good muscle tone generally will need no resuscitation.**
- **Most important vital signs in the newly born are respirations / respiratory effort and heart rate.**
- Heart rate best assessed by auscultation of the precordial pulse followed palpation of the umbilical pulse.
- Pulse oximetry should be applied to the right side of the body.
- **Expected pulse oximetry readings:** Following birth at 1 minute = 60 - 65 %, 2 minutes = 65 – 70%, 3 minutes = 70 – 75 %, 4 minutes = 75 – 80 %, 5 minutes = 80 – 85 % and 10 minutes = 85 – 95%.
- CPR in infants is 120 compressions/minute with a 3:1 compression to ventilation ratio.
- It is extremely important to keep infant warm
- Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended-supportive care only).
- Consider hypoglycemia in infant.
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)
- Document 1 and 5 minute Apgars in PCR

# Obstetrical Emergency

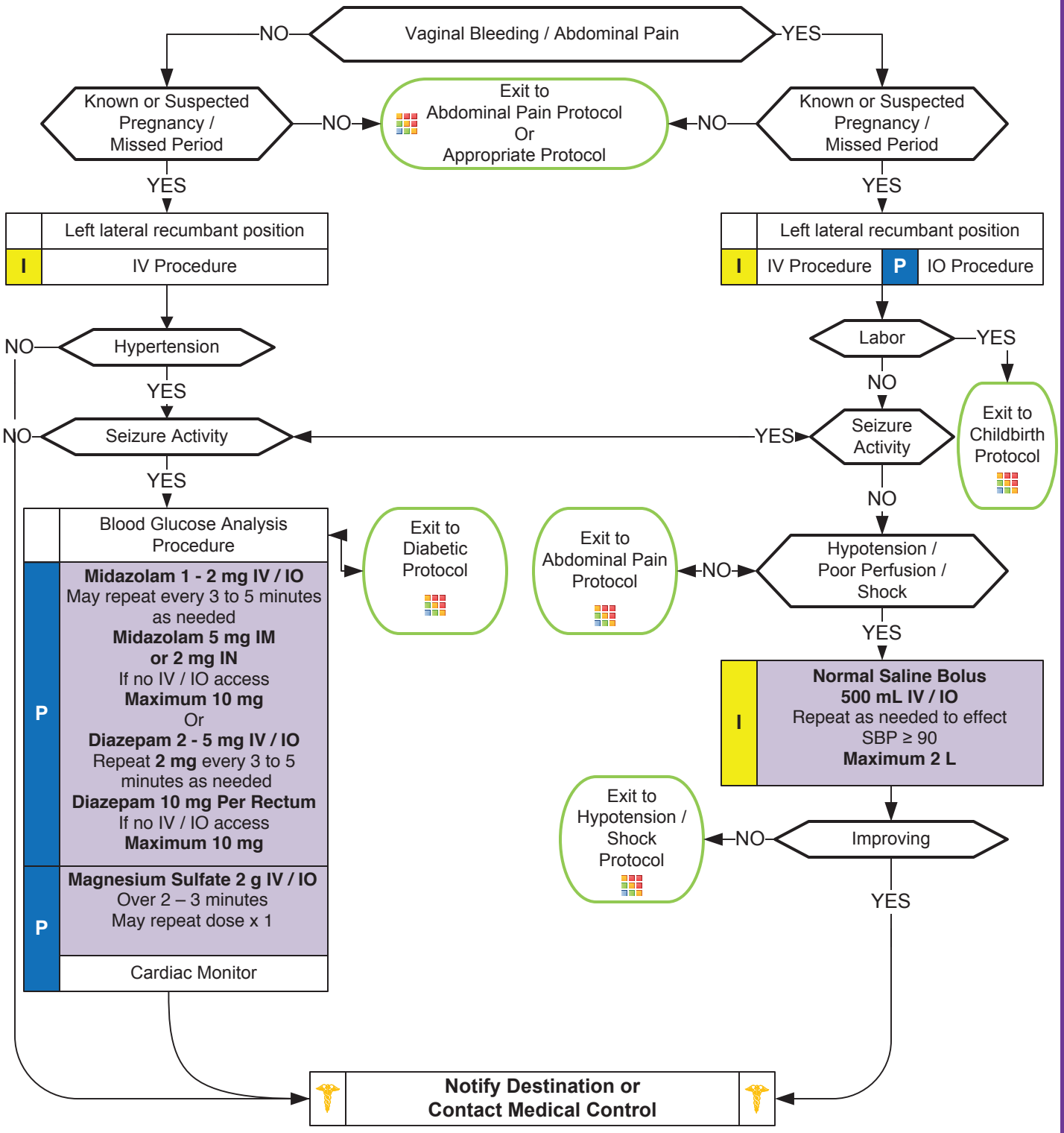
NCCEP

NORTH CAROLINA EMS OFFICE of EMS

## History
- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

## Signs and Symptoms
- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of hands and face

## Differential
- Pre-eclampsia / Eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion




Adult Obstetric Section Protocols

# Obstetrical Emergency



**Pearls**

- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- Severe headache, vision changes, or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Maintain patient in a left lateral position to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require 4 to 6 hours of fetal monitoring. DO NOT suggest the patient needs an ultrasound.
- Magnesium may cause hypotension and decreased respiratory drive. Use with caution.
- **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access.**

# Adult Thermal Burn

**History**
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

**Signs and Symptoms**
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/ distress could be indicated by hoarseness/wheezing

**Differential**
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assess Burn / Concomitant Injury Severity

## Minor Burn

**< 5% TBSA 2nd/3rd Degree Burn**
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater

- Remove Rings, Bracelets / Constricting Items
- Dry Clean Sheet or Dressings
- Adult Multiple Trauma Protocol ***if indicated***
- Adult Airway Protocol(s) ***as indicated***
- I — IV Procedure ***if indicated***
- I — **Normal Saline 0.25 mL / kg ( x % TBSA) / hr** for up to the first 8 hours. ***(More info below) Lactated Ringers if available***
- Adult Pain Control Protocol ***if indicated***

Carbon Monoxide / Cyanide Exposure

Transport Facility of Choice

## Serious Burn

**5-15% TBSA 2nd/3rd Degree Burn**
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
*(When reasonably accessible, transport to a Burn Center)*

## Criticial Burn

**>15% TBSA 2nd/3rd Degree Burn**
Burns with Multiple Trauma
Burns with definitive airway compromise
*(When reasonably accessible, transport to a Burn Center)*

- Remove Rings, Bracelets / Constricting Items
- Dry Clean Sheet or Dressings
- Adult Multiple Trauma Protocol ***if indicated***
- Adult Airway Protocol(s) ***as indicated***
- I — IV Procedure Consider 2 IV sites if greater than 15 % TBSA
- P — IO Procedure ***if indicated***
- I — **Normal Saline 0.25 mL / kg ( x % TBSA) / hr** for up to the first 8 hours. ***(More info below) Lactated Ringers if available***
- Adult Pain Control Protocol ***if indicated***

Carbon Monoxide / Cyanide Exposure

**Rapid Transport** to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

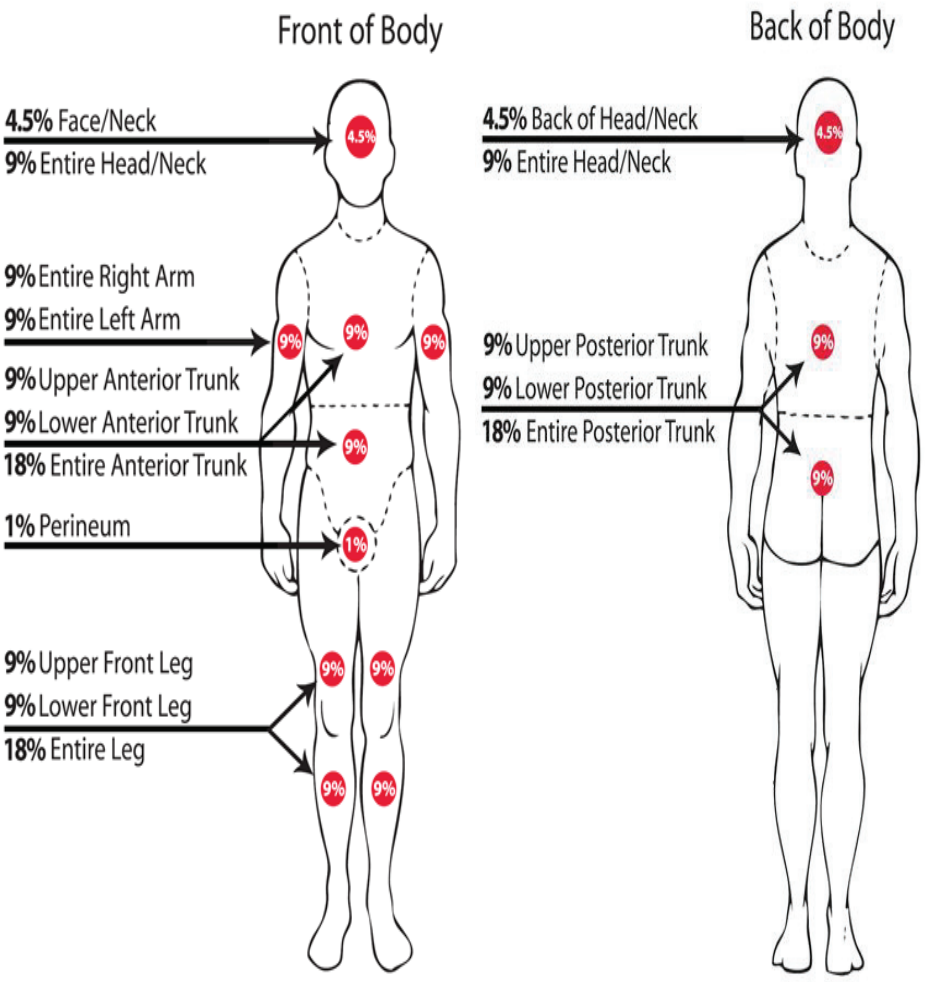
Carbon Monoxide / Cyanide Protocol

**Notify Destination or Contact Medical Control**

***1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.***
***2. Formula example; an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.***

Adult Trauma and Burn Section Protocols

# Adult Thermal Burn




Estimate spotty areas of burn by using the size of the patient's palm as 1 %

## Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burn from those of partial (2nd) or full (3rd) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1st degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th 5th and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns.
- Other burn classifications in general include:
  - 4th referring to a burn that destroys the dermis and involves muscle tissue.
  - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

## Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**
- **Critical or Serious Burns:**

  ***> 5-15% total body surface area (TBSA) 2nd or 3rd degree burns, or***
  ***3rd degree burns > 5% TBSA for any age group, or***
  ***circumferential burns of extremities, or***
  ***electrical or lightning injuries, or***
  ***suspicion of abuse or neglect, or***
  ***inhalation injury, or***
  ***chemical burns, or***
  ***burns of face, hands, perineum, or feet***
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.
- Never administer IM pain injections to a burn patient.

# Head Trauma

**History**
- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

**Signs and Symptoms**
- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

**Differential**
- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage or Laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

DO NOT HYPERVENTILATE

Ventilate 8 – 10 Breaths per minute to maintain EtCO2 35 – 45 mmHg

Spinal Immobilization Protocol ***if indicated***

Adult Multiple Trauma Protocol ***if indicated***

I — IV Procedure | P — IO Procedure

Altered Mental Status Protocol ***if indicated***

Seizure Protocol ***if indicated***

Blood Glucose Analysis Procedure

**Brain Herniation**
Unilateral or Bilateral Dilation of Pupils / Posturing

Hyperventilate 14 – 16 Breaths per minutes to maintain EtCO2 30 – 35 mmHg

**Assess Mental Status**
**Record GCS**

GCS ≤ 8

NO → Monitor and Reassess

YES → Able to Cough

NO →
- Airway Protocol(s)
- RSI Protocol ***if available***
- B — Maintain EtCO2 35 – 45 mmHg

YES →
- Supplemental oxygen Maintain SpO2 ≥ 94 %
- B — Maintain EtCO2 35 – 45 mmHg
- Monitor and Reassess
- Airway Protocol(s) ***if indicated***

**Notify Destination or Contact Medical Control**

Adult Trauma and Burn Section Protocols

# Head Trauma



**Pearls**

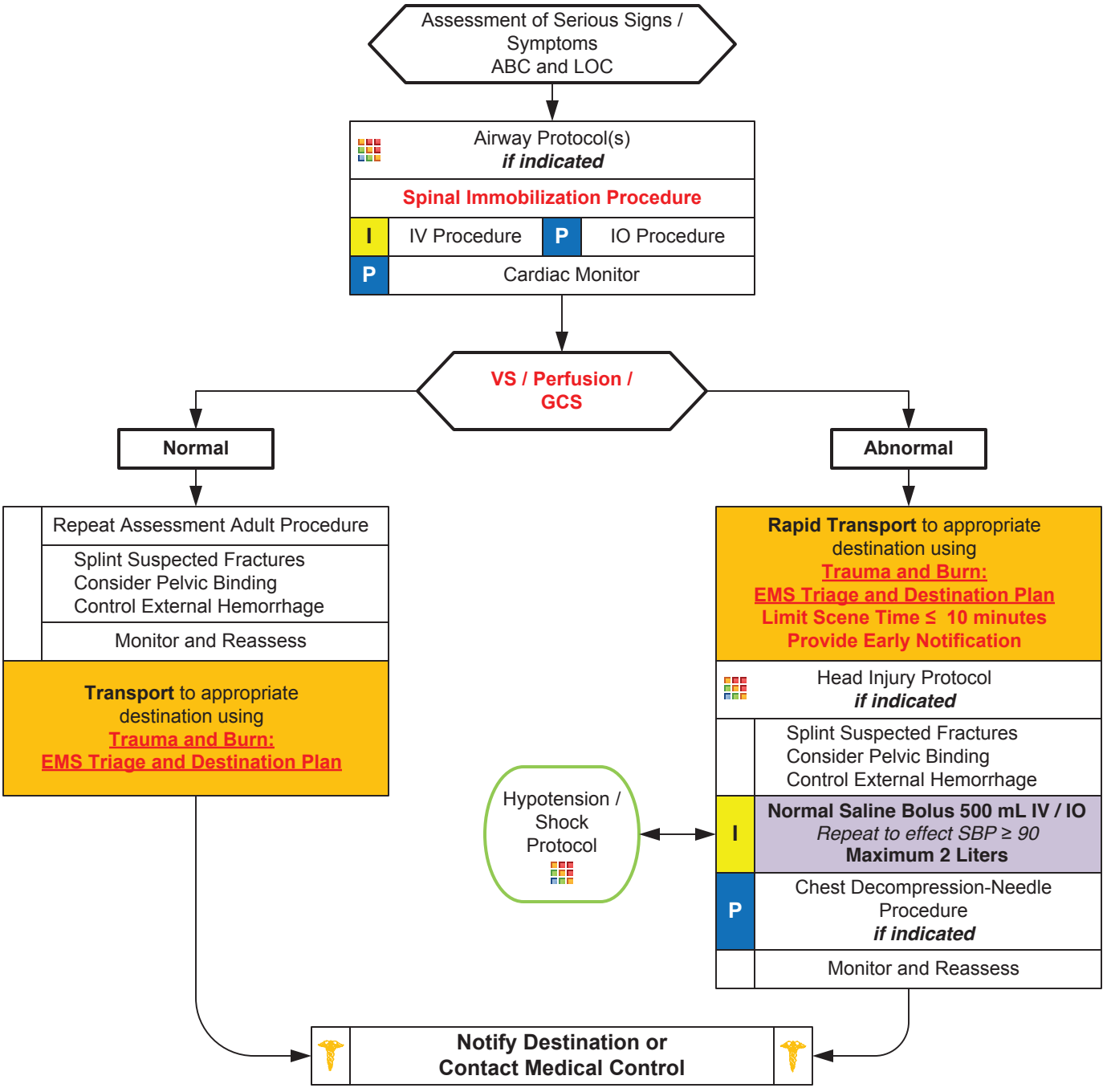
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **GCS is a key performance measure used in the EMS Acute Trauma Care Toolkit.**
- **If GCS < 12 consider air / rapid transport**
- **In areas with short transport times, RSI/Drug-Assisted Intubation is not recommended for patients who are spontaneously breathing and who have oxygen saturations of ≥ 90% with supplemental oxygen including BIAD / BVM.**
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- Limit IV fluids unless patient is hypotensive.
- Concussions are traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache. Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.

# Multiple Trauma

## History
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

## Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

## Differential (Life threatening)
- Chest: Tension pneumothorax, Flail chest, Pericardial tamponade, Open chest wound, Hemothorax
- Intra-abdominal bleeding
- Pelvis / Femur fracture
- Spine fracture / Cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia




Adult Trauma and Burn Section Protocols

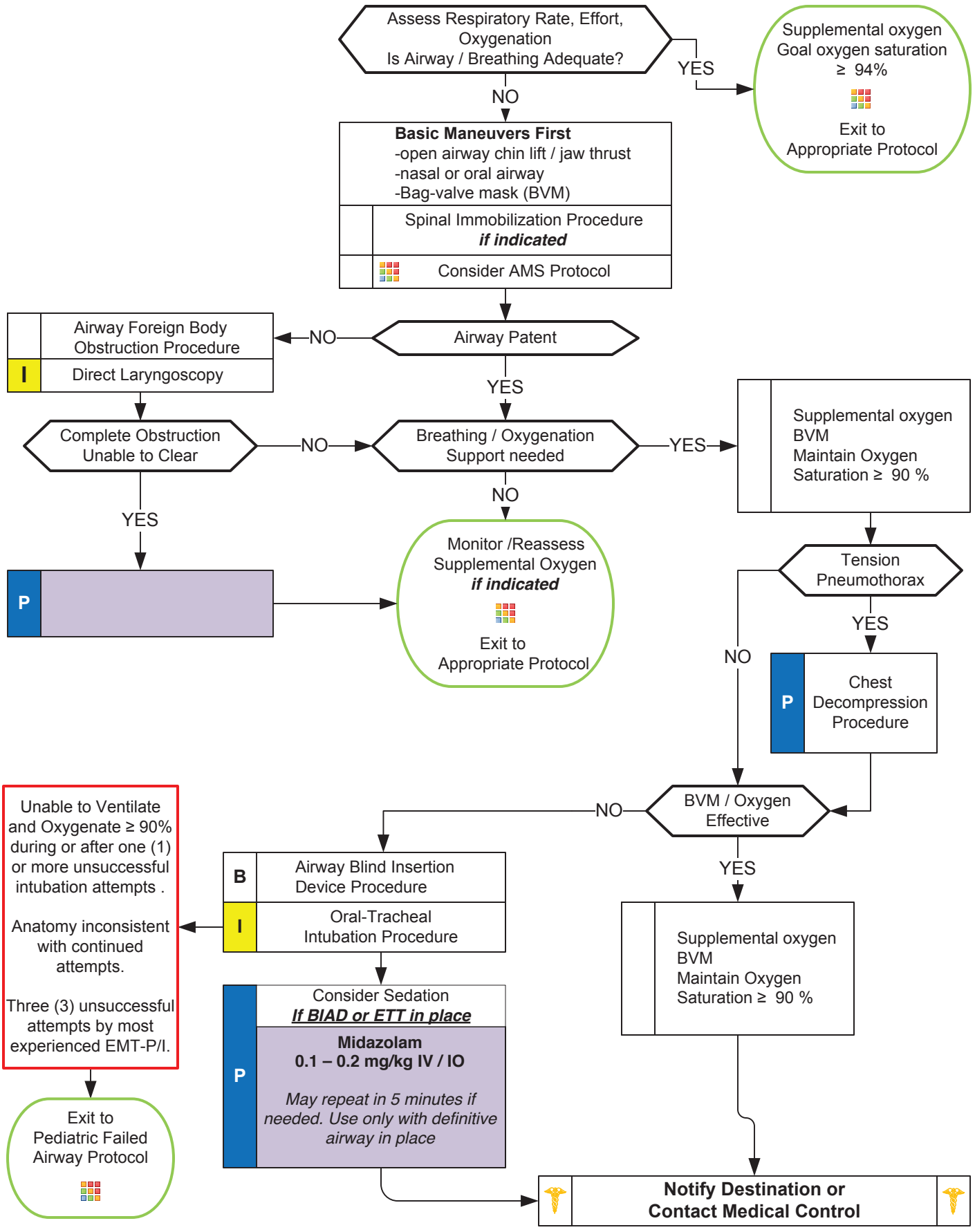
# Multiple Trauma



**Pearls**

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
- **Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained ≥ 90%**
- Geriatric patients should be evaluated with a high index of suspicion. Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning.
- Mechanism is the most reliable indicator of serious injury.
- In prolonged extrications or serious trauma, consider air transportation for transport times and the ability to give blood.
- Do not overlook the possibility of associated domestic violence or abuse.

# Pediatric Airway




Pediatric General Section Protocols

# Pediatric Airway



PEARLS:

* Pediatric Airway Cricothyrotomy Needle procedure is not utilized in Pitt County.

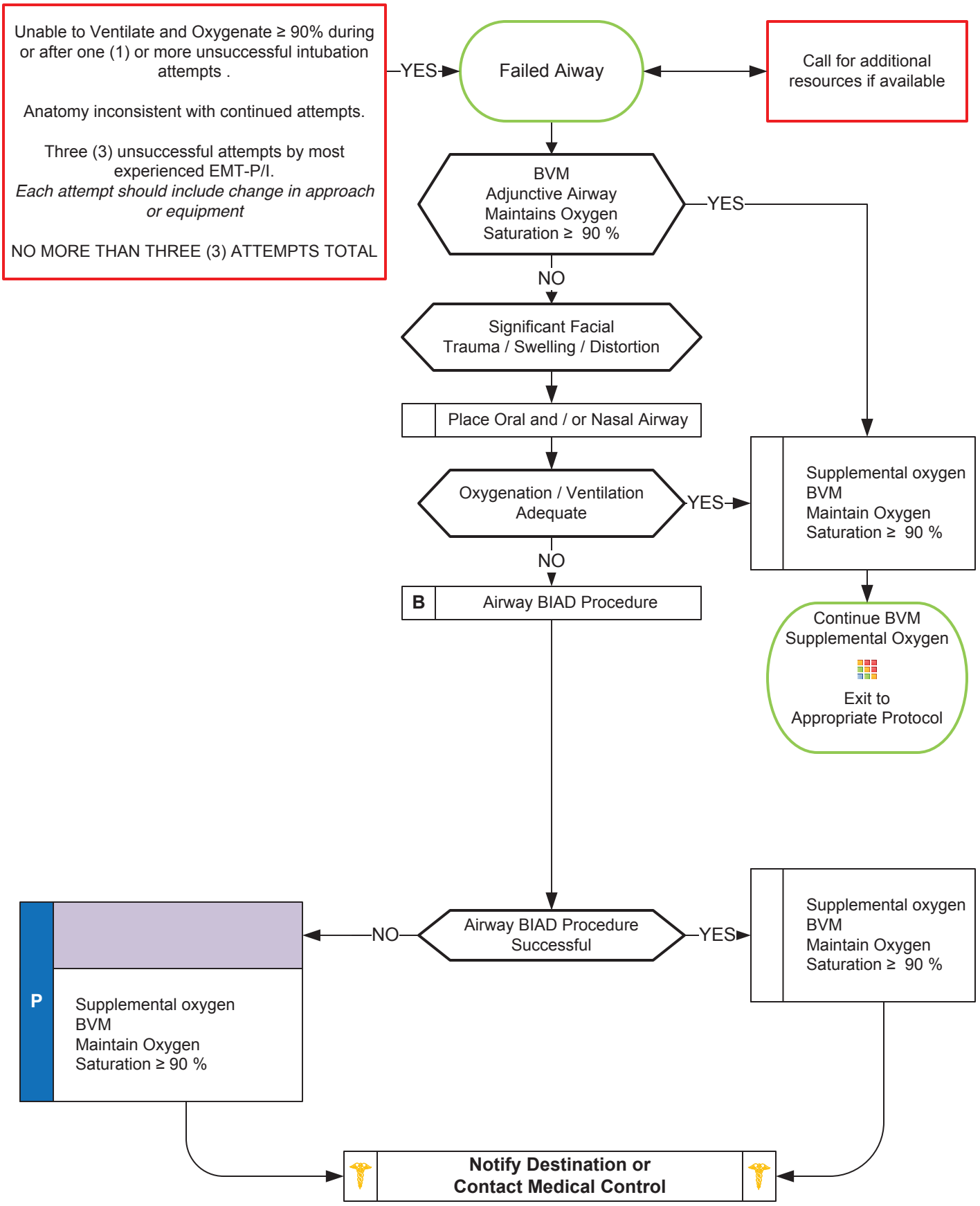


## Pearls

- **For this protocol, pediatric is defined as less than ≤ 11 years of age or any patient which can be measured within the Broselow-Luten tape.**
- **Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography (EtCO2) is strongly recommended with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Ventilatory rate should be 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 12 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **Hyperventilation in deteriorating head trauma should only be done to maintain a $pCO_2$ of 30-35.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- Do not attempt intubation in patients who maintain a gag reflex.
- Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- Cricoid pressure and BURP maneuver may be used to assist with difficult intubations. They may worsen view in some cases.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **<u>Airway Cricothyrotomy Needle Procedure:</u>**

  **Indicated as a lifesaving / last resort procedure in pediatric patients ≤ 11 years of age.**
  **Very little evidence to support it's use and safety.**
  **A variety of alternative pediatric airway devices now available make the use of this procedure rare.**
  **Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.**

# Pediatric Failed Airway



# Pediatric Failed Airway

PEARLS:

* Pediatric Airway Cricothyrotomy Needle procedure is not utilized in Pitt County.



## Pearls

- **For this protocol, pediatric is defined as less than ≤ 11 years of age or any patient which can be measured within the Broselow-Luten tape.**
- **Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography (EtCO2) is strongly recommended with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Ventilatory rate should be 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 12 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **Hyperventilation in deteriorating head trauma should only be done to maintain a $pCO_2$ of 30-35.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- **If first intubation attempt fails, make an adjustment and then try again:** Different laryngoscope blade; Gum Elastic Bougie; Different ETT size; Change cricoid pressure; Apply BURP; Change head positioning
- Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- Cricoid pressure and BURP maneuver may be used to assist with difficult intubations. They may worsen view in some cases.
- Gastric tube placement should be considered in all intubated patients.
- It is important to secure the endotracheal tube well and consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **Airway Cricothyrotomy Needle Procedure:**

  **Indicated as a lifesaving / last resort procedure in pediatric patients ≤ 11 years of age.**
  **Very little evidence to support it's use and safety.**
  **A variety of alternative pediatric airway devices now available make the use of this procedure rare.**
  **Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.**

# Pediatric Pain Control

NCCEP

NORTH CAROLINA EMS OFFICE of EMS

## History
- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- Past medical history
- Medications
- Drug allergies

## Signs and Symptoms
- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

## Differential
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)

Allow for position of maximum comfort unless contraindicated

Enter from **Protocol** based on **Specific Complaint**

Assess
Pain Severity
Use combination of Pain Scale, Circumstances, MOI, Injury or Illness severity

**Mild**

| | |
|---|---|
| B | **Ibuprofen 10 mg/kg PO**<br>**Maximum 800 mg**<br>Or<br>**Acetaminophen 15 mg/kg PO**<br>**Maximum 1000 mg** |
| I | Consider IV Procedure<br>***if indicated*** |
| | Monitor and Reassess<br>every 5 minutes |

**Moderate to Severe**

| | | | |
|---|---|---|---|
| I | IV Procedure | P | IO Procedure |
| I | **Ketorolac 0.5 mg/kg IV / IO / IM**<br>**Maximum 30 mg** | | |
| P | Cardiac Monitor | | |
| P | **Morphine 0.1 mg/kg IV / IO / IM**<br>May repeat every 5 minutes<br>**Maximum single dose 5 mg**<br>**Maximum dose 10 mg**<br>Or<br>**Fentanyl 1 mcg/kg IV / IM / IN**<br>May repeat 0.5 mcg/kg every 5 minutes<br>**Maximum dose 2 mcg/kg** | | |
| P | Monitor and Reassess<br>Every 5 minutes following sedative | | |
| | Monitor and Reassess<br>every 5 minutes | | |

**Notify Destination or Contact Medical Control**

Pediatric General Section Protocols

## Pearls
- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.**
- **For children use Wong-Baker faces scale or the FLACC score (see Assessment Pain Procedure)**
- **Vital signs should be obtained pre, 5 minutes post, and at disposition with all pain medications.**
- **Contraindications to Narcotic use include hypotension, head injury, or respiratory distress.**
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- **Ibuprofen / Ketorolac** should not be given if there is abdominal pain, history of gastritis, stomach ulcers, fracture, or if patient will require sedation.
- Do not administer any PO medications for patients who may need surgical intervention such as open fractures or fracture deformities.
- **Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain**
- **Consider agency-specific anti-emetic(s) for nausea and/or vomiting.**

# Pediatric Asystole / PEA

## History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse; shaken baby syndrome, pattern of injuries
- SIDS

## Signs and Symptoms
- Unresponsive
- Cardiac Arrest
- Signs of lividity or rigor

## Differential
- Respiratory failure
- Foreign body
- Hyperkalemia
- Infection (croup, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

Pediatric Pulseless Arrest Protocol

**Criteria for Death / No Resuscitation Review DNR / MOST Form**

YES → Do not begin Resuscitation. Follow Deceased Subjects Policy

NO →

**Begin Continuous CPR Compressions Push Hard (1.5 inches Infant / 2 inches in Children) Push Fast (≥ 100 / min) Change Compressors every 2 minutes (*Limit changes / pulses checks ≤ 10 seconds*)**

P — Cardiac Monitor

**Shockable Rhythm**

YES → Follow Rhythm Appropriate Protocol

NO →

Search for Reversible Causes →

I

IV Procedure | P | IO Procedure

**Epinephrine1:10,000**
**0.01 mg/kg IV/IO (max 1mg)**
(0.1 mL / kg of 1:10,000)
Repeat every 3 – 5 minutes

**Normal Saline Bolus 10 mL/kg IV / IO**
May repeat as needed **Maximum 60 mL/kg**

Blood Glucose Analysis Procedure

Pediatric Diabetic Protocol
***as indicated***

P

Consider
**Dopamine 2 – 20 mcg/kg/min IV / IO**

Consider Chest Decompression-Needle Procedure

Consider
Beta Blocker OD
Calcium Channel Blocker OD

Pediatic Toxicology Protocol

**Notify Destination or Contact Medical Control**

**AT ANY TIME**

**Return of Spontaneous Circulation**

**Go to Post Resuscitation Protocol**

**Reversible Causes**

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia
Hypoglycemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

**Pediatric Cardiac Section Protocols**

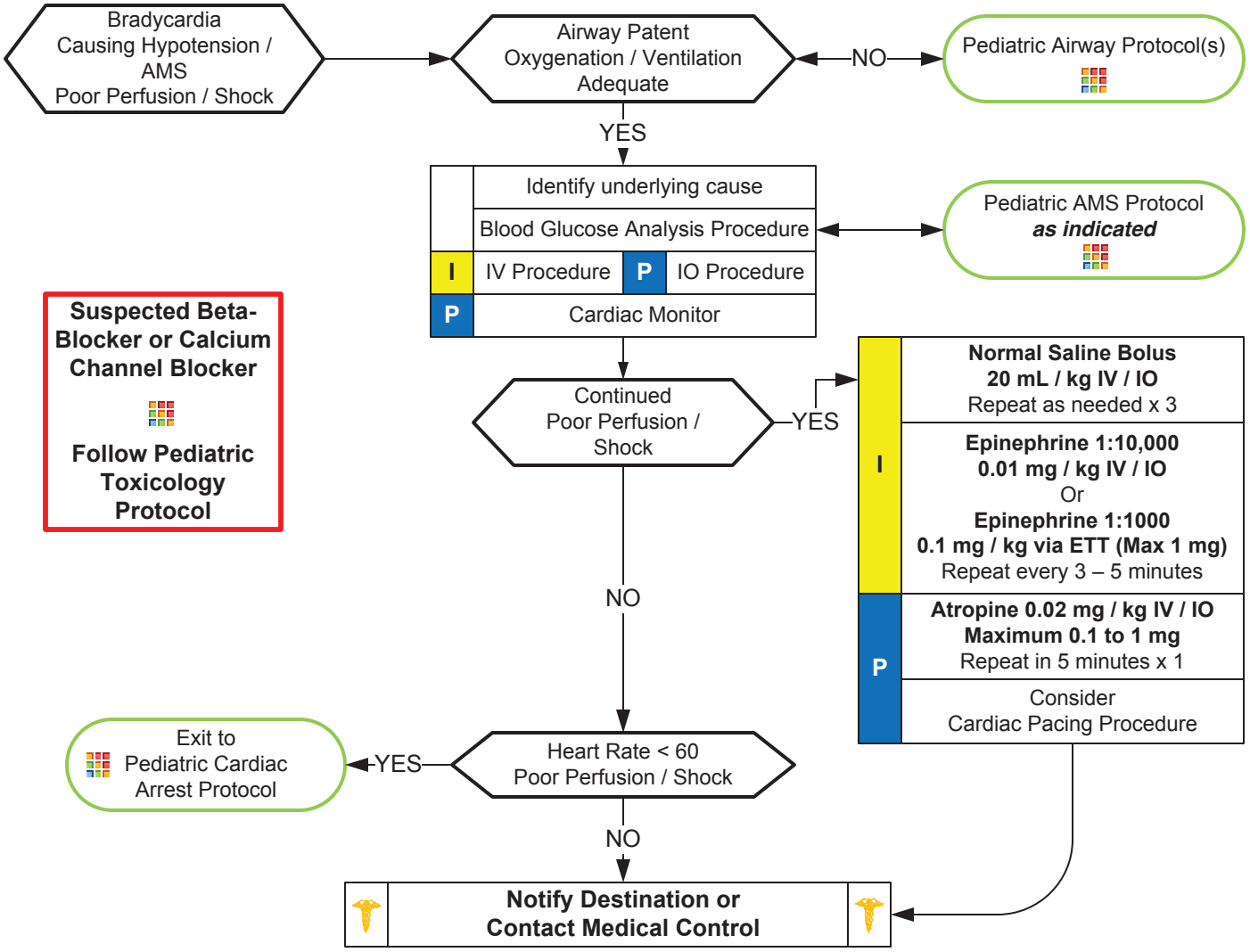
## Pearls
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults early airway intervention is critical.
- In most cases pediatric airways can be managed by basic interventions.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (**Maximum 10 mg**)

# Pediatric Bradycardia

## History
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

## Signs and Symptoms
- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered level of consciousness

## Differential
- Respiratory failure
  - Foreign body
  - Secretions
  - Infection (croup, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis




Pediatric Cardiac Section Protocols

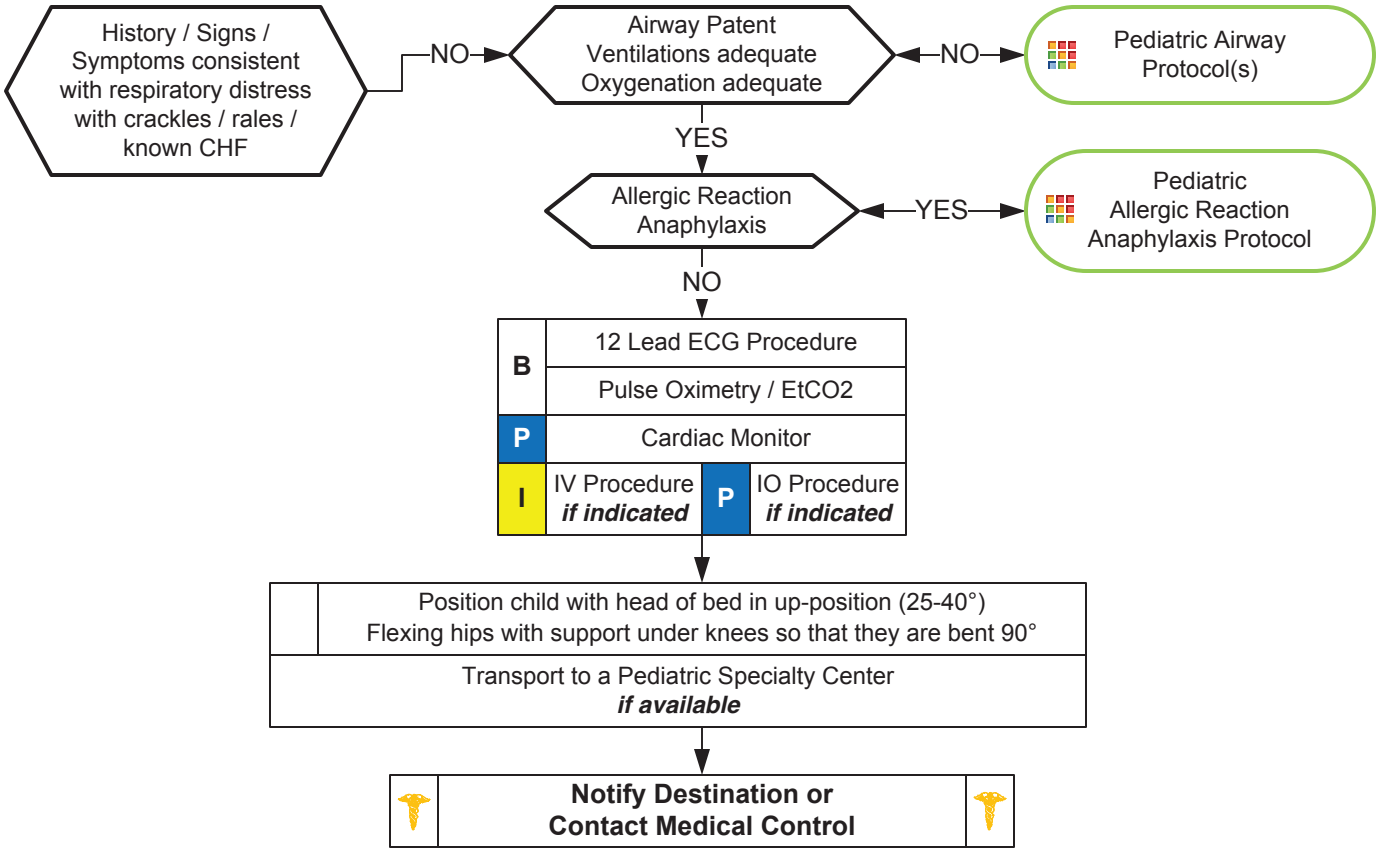
## Pearls
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Use Broselow-Luten Tape for drug dosages if applicable.**
- Infant ≤ 1 year of age
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers guidelines.
- Minimum Atropine dose is 0.1 mg IV.

# Pediatric Pulmonary Edema / CHF

## History
- Congenital Heart Disease
- Chronic Lung Disease
- Congestive heart failure
- Past medical history

## Signs/Symptoms
- Infant: Respiratory distress, poor feeding, lethargy, weight gain, +/- cyanosis
- Child/Adolescent: Respiratory distress, bilateral rales, apprehension, orthopnea, jugular vein distention (rare), pink, frothy sputum, peripheral edema, diaphoresis, chest pain
- Hypotension, shock

## Differential
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure




Pediatric Cardiac Section Protocols

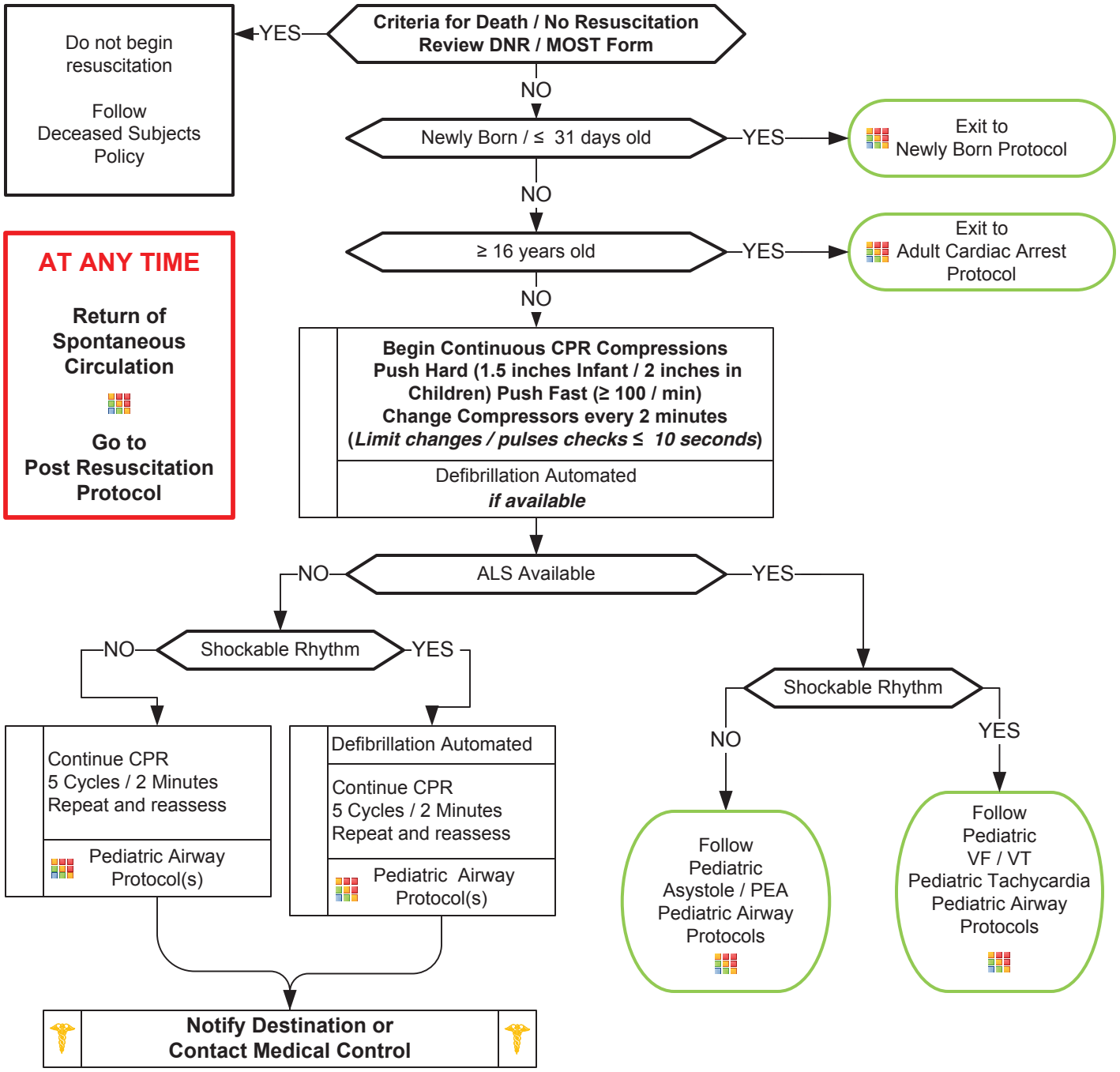
## Pearls
- **Recommended exam: Mental status, Respiratory, Cardiac, Skin, Neuro**
- **Contact Medical Control early in the care of the pediatric cardiac patient.**
- **Most children with CHF have a congenital heart defect, obtain a precise past medical history.**
- **Congenital heart disease varies by age:**
  - < 1 month: Tetralogy of Fallot, Transposition of the great arteries, Coarctation of the aorta.
  - 2 – 6 months: Ventricular septal defects (VSD), Atrioseptal defects (ASD).
  - Any age: Myocarditis, Pericarditis, SVT, heart blocks.
- **Treatment of Congestive Heart Failure / Pulmonary edema may vary depending on the underlying cause and may include the following with consultation by Medical Control:**
  - **MorphineSulfate: 0.1 mg/kg IV / IO. Max single dose 5mg/dose**
  - **Fentanyl: 1 mcg/kg IV / IO. Max single dose 50 mcg.**
  - **Nitroglycerin: Dose determined after consultation of Medical Control.**
  - **Lasix 1 mg/kg IV / IO.**
  - **Dopamine 2 – 20 mcg/kg IV / IO. Titrate to age specific systolic blood pressure.**
- Do not assume all wheezing is pulmonary, especially in a cardiac child: avoid albuterol unless strong history of recurrent wheezing secondary to pulmonary etiology (discuss with Medical Control)

# Pediatric Pulseless Arrest

## History
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Hypothermia

## Signs and Symptoms
- Unresponsive
- Cardiac arrest

## Differential
- Respiratory failure
  Foreign body, Secretions, Infection (croup, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, K)
- Acidosis




Pediatric Cardiac Section Protocols

# Pediatric Pulseless Arrest





**Pearls**

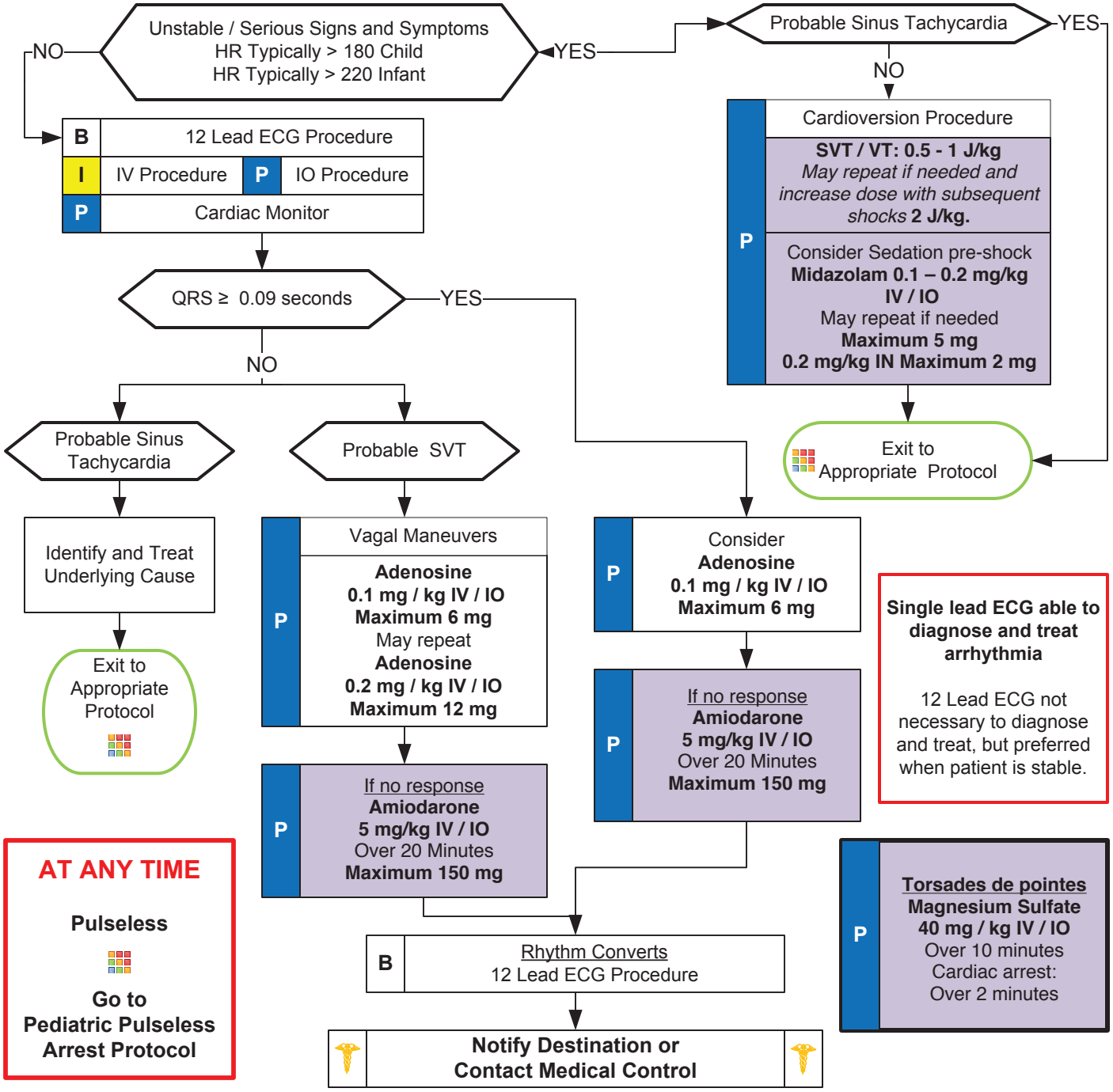
- **Recommended Exam: Mental Status**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or supraglottic device. Patient survival is often dependent on proper ventilation and oxygenation / Airway Interventions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach assigning responders to predetermined tasks.
- Team Focused Approach / Pit-Crew Approach. Refer to optional protocol or development of local agency protocol.
- Reassess and document endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- Monophasic and Biphasic waveform defibrillators should use the same energy levels 2 joules / kg and increase to 4 joules / kg on subsequent shocks.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.

# Pediatric Tachycardia

## History
- Past medical history
- Medications or Toxic Ingestion (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Drugs (nicotine, cocaine)
- Congenital Heart Disease
- Respiratory Distress
- Syncope or Near Syncope

## Signs and Symptoms
- Heart Rate: Child > 180/bpm
  Infant > 220/bpm
- Pale or Cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered Level of Consciousness
- Pulmonary Congestion
- Syncope

## Differential
- Heart disease (Congenital)
- Hypo / Hyperthermia
- Hypovolemia or Anemia
- Electrolyte imbalance
- Anxiety / Pain / Emotional stress
- Fever / Infection / Sepsis
- Hypoxia
- Hypoglycemia
- Medication / Toxin / Drugs (see HX)
- Pulmonary embolus
- Trauma
- Tension Pneumothorax




Pediatric Cardiac Section Protocols

# Pediatric Tachycardia





**Pearls**

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Serious Signs and Symptoms:**
  - **Respiratory distress / failure.**
  - **Signs of shock / poor perfusion with or without hypotension.**
  - **AMS**
  - **Sudden collapse with rapid, weak pulse**
- **Narrow Complex Tachycardia (≤ 0.09 seconds):**
  - Sinus tachycardia: P waves present. Variable R-R waves. Infants usually < 220 beats / minute. Children usually < 180 beats / minute.
  - SVT: > 90 % of children with SVT will have a narrow QRS (≤0.09 seconds.) P waves absent or abnormal. R-R waves not variable. Usually abrupt onset. Infants usually > 220 beats / minute. Children usually > 180 beats / minute.
  - Atrial Flutter / Fibrillation
- **Wide Complex Tachycardia (≥ 0.09 seconds):**
  - SVT with aberrancy.
  - VT: Uncommon in children. Rates may vary from near normal to > 200 / minute. Most children with VT have underlying heart disease / cardiac surgery / long QT syndrome / cardiomyopathy.
- **Torsades de Pointes / Polymorphic (multiple shaped) Tachycardia:**
  - Rate is typically 150 to 250 beats / minute.
  - Associated with long QT syndrome, hypomagnesaemia, hypokalemia, many cardiac drugs.
  - May quickly deteriorate to VT.
- **Vagal Maneuvers:**
  - Breath holding. Blowing a glove into a balloon. Have child blow out “birthday candles” or through an obstructed straw. Infants: May put a bag of ice water over the upper half of the face careful not to occlude the airway.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric paddles should be used in children < 10 kg or Broselow-Luten color Purple if available.
- Monitor for respiratory depression and hypotension associated if Diazepam or Midazolam is used.
- Continuous pulse oximetry is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Generally, the maximum sinus tachycardia rate is 220 – the patient’s age in years.

# Pediatric Ventricular Fibrillation
# Pulseless Ventricular Tachycardia

NCCEP

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## History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

## Signs and Symptoms
- Unresponsive
- Cardiac Arrest

## Differential
- Respiratory failure / Airway obstruction
- Hyper / hypokalemia
- Hypovolemia
- Hypothermia
- Hypoglycemia
- Acidosis
- Tension pneumothorax
- Tamponade
- Toxin or medication
- Thrombosis: Coronary / Pulmonary Embolism
- Congenital heart disease

Pediatric Pulseless Arrest Protocol

P — **Defibrillation Manual Procedure 2 Joules/kg**

**Begin Continuous CPR Compressions**
**Push Hard (1.5 inches Infant / 2 inches in Children) Push Fast (≥ 100 / min)**
**Change Compressors every 2 minutes**
**(*Limit changes / pulses checks ≤ 10 seconds*)**

Pediatric Airway Protocol(s)

IV Procedure | P — IO Procedure

I — **Epinephrine (1:10,000 ) 0.01 mg/kg IV / IO**
**Maximum 1 mg each dose**
Repeat every 3 to 5 minutes

P — **Defibrillate Manual Procedure 4 Joules/kg**

**Begin Continuous CPR Compressions**
**Push Hard. Push Fast (≥ 100 / min)**
**Change Compressors every 2 minutes**
**(*Limit changes / pulses checks ≤ 10 seconds*)**

**<u>If Rhythm Refractory</u>**
**Continue CPR and give Agency specific Anti-arrhythmics / Epinephrine during compressions.**
**Continue CPR up to point where you are ready to defibrillate with device charged.**
**Repeat pattern during resuscitation.**

P — **Amiodarone 5 mg/kg IV / IO**
**Maximum dose 300 mg**
Repeat every 5 minutes
**Maximum dose 150 mg**
**Maximum total dose 15 mg/kg**

**Defibrillate Manual Procedure**

High Quality, Continuous Compressions

P — **Lidocaine 1 mg/kg IV / IO**
**Maximum 100 mg**
**Repeat 0.5 mg/kg**
**Maximum 3 mg/kg total**

**Notify Destination or Contact Medical Control**

**AT ANY TIME**

**Return of Spontaneous Circulation**

**Go to Post Resuscitation Protocol**

**<u>Persistent VF / VT</u>**

After second defibrillation may increase energy in increments of 2 Joules/kg not to exceed **10 Joules/kg Maximum**

**Magnesium Sulfate**
**40 mg/kg IV / IO**
May repeat every 5 minutes
**Maximum 2 g**

**<u>Tosades de points</u>**

P — **Magnesium Sulfate**
**40 mg/kg IV / IO**
May repeat every 5 minutes
**Maximum 2 g**

**Pediatric Cardiac Section Protocols**

# Pediatric Ventricular Fibrillation
# Pulseless Ventricular Tachycardia





**Pearls**

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or supraglottic device. Patient survival is often dependent on proper ventilation and oxygenation / Airway Interventions
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults early ventilation intervention is critical.
- In most cases pediatric airways can be managed by basic interventions.
- Reassess and document endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- Monophasic and Biphasic waveform defibrillators should use the same energy levels 2 joules / kg and increase to 4 joules / kg on subsequent shocks.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.

# Pediatric Post Resuscitation

**History**
- Respiratory arrest
- Cardiac arrest

**Signs/Symptoms**
- Return of pulse

**Differential**
- Continue to address specific differentials associated with the original dysrhythmia

Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

| | Repeat Primary Assessment | | |
|---|---|---|---|
| B | **Optimize Ventilation and Oxygenation**<br>• Maintain SpO2 ≥ 94 %<br>• Advanced airway if indicated<br>• ETCO2 ideally 35 – 45 mm Hg<br>• Respiratory Rate 8 – 10<br>• Remove Impedence Threshold Device<br>DO NOT HYPERVENTILATE | | |
| | Monitor Vital Signs / Reassess | | |
| B | 12 Lead ECG Procedure | | |
| I | IV Procedure | P | IO Procedure |
| P | Cardiac Monitor | | |

**Hypotension Age Based**

**0 – 28 Days**
*< 60 mmHg*

**1 Month to 1 Year**
*< 70 mmHg*

**1 to 10 Years**
*< 70 + ( 2 x age) mmHg*

**11 Years and older**
*< 90 + ( 2 x age) mmHg*

Hypotension Age based
- YES → I: **Normal Saline Bolus 10 mL/kg IV / IO** May repeat to **60 mL/kg** if lungs remain clear; P: **Dopamine 2 – 20 mcg/kg/min IV / IO** Titrate to SBP age appropriate
- NO ↓

Blood Glucose ≤ 69 or ≥ 250
- YES → Pediatric Diabetic Protocol
- NO ↓

Symptomatic Bradycardia
- YES → Pediatric Bradycardia Protocol
- NO ↓

Symptomatic Tachycardia
- YES → Pediatric Tachycardia Protocol
- NO ↓

ROSC After Defibrillation and **NO** Antiarrhythmic
- YES → P: **Amiodarone 5 mg/kg IV / IO** Infuse over 10 minutes
- NO → P: Continue Antiarrhythmic Utilized Refer to Appropriate Pediatric Arrhythmia Protocol
- ↓

P: Consider Sedation / Paralysis
Use only with definitive airway in place

**Versed 0.1 – 0.2 mg/kg IV / IO**
May repeat in 3 -5 minutes as needed
And / Or
**Fentanyl 1 mcg/kg IV / IO bolus**
May repeat 1 mcg/kg every 20 minutes
As needed
**Maximum 200 mcg**

↓

**Notify Destination or Contact Medical Control**

Pediatric Cardiac Section

# Pediatric Post Resuscitation



**Pearls**

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- Hyperventilation is a significant cause of hypotension / recurrence of cardiac arrest in post resuscitation phase and must be avoided.
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

# Pediatric Allergic Reaction

## History
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past medical history / reactions
- Medication history

## Signs and Symptoms
- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema

## Differential
- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma / COPD / CHF

Assess Symptom Severity

### MILD

**B**
- **Diphenhydramine 1 mg / kg mg PO**

**I**
- IV Procedure *If indicated*
- **Diphenhydramine 1 mg / kg IV / IM / IO**
- **Famotidine 0.25 mg/kg** ***IV over 1 yo, if available***

**B**
- Monitor and Reassess Monitor for Worsening Signs and Symptoms

### MODERATE

**B**
- **Epinephrine 1:1000 Auto-Injector ≥ 30 kg Adult Epi Pen IM < 30 kg Epi Pen Jr IM** ***if available***
- **Diphenhydramine 1 mg / kg PO**
- **Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3 ***if indicated***

**I**
- **Epinephrine 1:1000 0.01 mg / kg IM Maximum 0.3 mg** Repeat in 5 minutes if no improvement
- IV Procedure
- **Diphenhydramine 1 mg / kg IV / IM / IO** ***if not already given PO***
- **Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated***
- **Famotidine 0.25 mg/kg** ***IV over 1 yo, if available***

**P**
- **Methylprednisolone 2 mg/kg IV Maximum dose 125 mg**

### SEVERE

- **Epinephrine 1:1000 Auto-Injector ≥ 30 kg Adult Epi Pen IM < 30 kg Epi Pen Jr IM** ***if available***

**B**
- **Diphenhydramine 1 mg / kg PO**
- **Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3 ***if indicated***

- Airway Pediatric Protocol(s) ***if indicated***

**I**
- **Epinephrine 1:1000 0.01 mg / kg IM Maximum 0.3 mg** Repeat in 5 minutes if no improvement
- IV Procedure | **P** | IO Procedure
- **Diphenhydramine 1 mg / kg IV / IM / IO** ***if not already given PO***
- **Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated***
- **Normal Saline Bolus 20 mL/kg IV / IO** Repeat as needed to effect age appropriate SBP **Maximum 60 mL/kg**
- **Famotidine 0.25 mg/kg** ***IV over 1 yo, if available***

**P**
- **Methylprednisolone 2 mg/kg IV Maximum dose 125 mg**

Cardiac Monitoring Indicated for Moderate and Severe Reactions

**Notify Destination or Contact Medical Control**

Pediatric Medical Section Protocols

# Pediatric Allergic Reaction



PEARLS:

* EMT-I/EMT-P: May administer the Histamine (H2) Blocker, Famotidine (Pepcid) 0.25 mg/kg for children over one (1) year of age.

* EMT-B: Consider Diphenhydramine (Benadryl) PO dose: greater than 2 years of age and 30 pounds: 12.5 mg (1/2 tablet); over 50 pounds: 25 mg (a full tablet).

* Conversion of pounds to kilograms: 2.2 pounds = 1.0 kilogram (example: 30 pounds divided by 2.2 pounds = 14 kilograms).

* MR / EMT-B may administer Epinephrine IM as auto-injector only and may administer from EMS supply. Medical Director does not require medical control contact prior to administration.
* EMT-B may administer diphenhydramine by oral route only and may administer from EMS supply. Medical Director does not require medical control contact prior to administration.
*EMT-B may administer Albuterol (only) if patient already prescribed and may administer from EMS supply. Medical Director does not require medical control contact prior to administration.

## Pearls

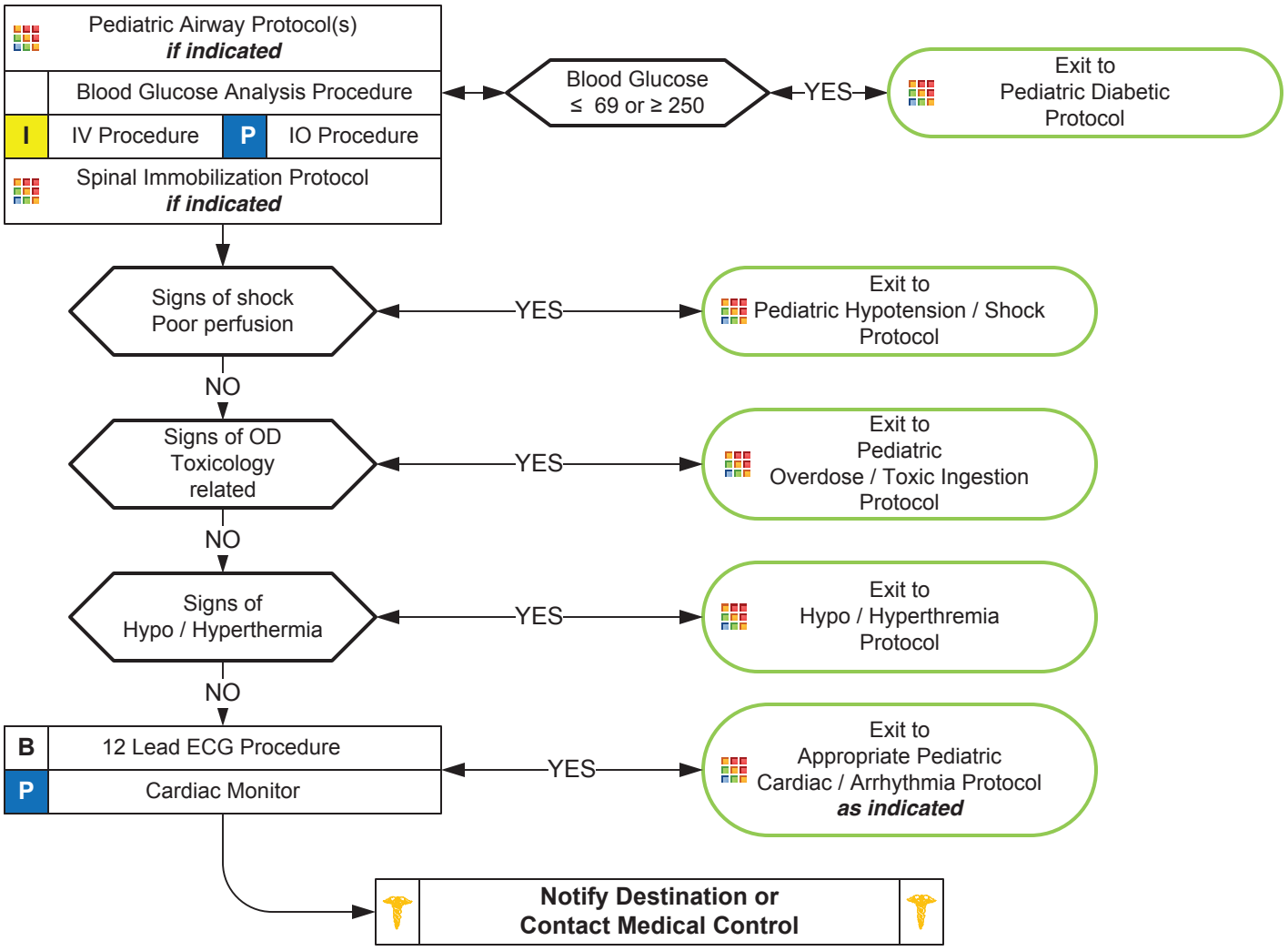
- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.) IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for appropriate dosing.**
- **Symptom Severity Classification:**
  - **Mild symptoms:**
    - **Flushing, hives, itching, erythema with normal blood pressure and perfusion.**
  - **Moderate symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.**
  - **Severe symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion.**
- **Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.**
- **Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.**
- **Fluids and Medication titrated to maintain a SBP >70 + (age in years x 2) mmHg.**
- **MR / EMT-B may administer Epinephrine IM as Auto-injector only and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to MR / EMT-B administering any medication.
- **EMT-B may administer diphenhydramine by oral route only and may administer from EMS supply**. Agency Medical Director may require contact of medical control prior to EMT-B / MR administering any medication.
- **EMT-B may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMT-B / MR administering any medication.
- **Patients with moderate and severe reactions should receive a 12 lead ECG and should be continually monitored, but this should NOT delay administration of epinephrine.**
- The shorter the onset from symptoms to contact, the more severe the reaction.
- The shorter the onset from exposure to symptoms the more severe the reaction.

# Pediatric Altered Mental Status

## History
- Past medical history
- Medications
- Recent illness
- Irritability
- Lethargy
- Changes in feeding / sleeping
- Diabetes
- Potential ingestion
- Trauma

## Signs and Symptoms
- Decrease in mentation
- Change in baseline mentation
- Decrease in Blood sugar
- Cool, diaphoretic skin
- Increase in Blood sugar
- Warm, dry, skin, fruity breath, kussmaul respirations, signs of dehydration

## Differential
- Hypoxia
- CNS (trauma, stroke, seizure, infection)
- Thyroid (hyper / hypo)
- Shock (septic-infection, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicological
- Acidosis / Alkalosis
- Environmental exposure
- Electrolyte abnormatilities
- Psychiatric disorder




Pediatric Medical Section Protocols

## Pearls
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Pay careful attention to the head exam for signs of bruising or other injury.**
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon
- Consider alcohol, prescription drugs, illicit drugs and Over the Counter preparations as a potential etiology.
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.

# Pediatric Diabetic

## History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

## Signs and Symptoms
- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

## Differential
- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.

Pediatric Altered Mental Status Protocol *if indicated*

Blood Glucose Analysis Procedure

I: IV Procedure | P: IO Procedure

P: Cardiac Monitor *if indicated*

I: ***Blood glucose ≤ 69 mg / dl Symptomatic with NO IV / IO Access:***
Awake, alert and able to tolerate oral agent: Give **oral glucose solution**
If unable to tolerate oral:
**Glucagon 0.1 mg/kg IM (Maximum 1 mg)**
Repeat every 15 minutes as needed to keep Blood glucose > 60 mg / dl.

**Blood Sugar ≤ 69 mg / dl**

Awake and alert but symptomatic
- NO → I
- YES → Consider **Oral Glucose Solution** *If age appropriate* → I

I:
< 31 Days:
**D10 6 mL/kg IV / IO**
Repeat as needed

31 Days to 2 Years:
**D25 4 mL/kg IV / IO**
Repeat as needed

> 2 Years:
**D50 2 mL/kg IV / IO**
**Maximum 25 g per dose**
Repeat as needed

Repeat Dextrose per appropriate treatment arm

Every 5 minutes Until Blood Glucose 70 mg / dl or greater

**Blood Sugar 70 – 249 mg / dl**

Monitor Blood Glucose Q 15 minutes

Exit to Appropriate Protocol

**Blood Sugar ≥ 250 mg / dl**

Dehydration with no evidence of CHF/ Fluid Overload

I: **Normal Saline Bolus**
**10 mL/kg IV / IO**
Repeat as needed to effect age appropriate SBP
**Maximum 60 mL/kg**

**Notify Destination or Contact Medical Control**

Pediatric Medical Section Protocols

# Pediatric Diabetic





**Pearls**

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Patients with prolonged hypoglycemia my not respond to glucagon.
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- **Make D10 by removing 10 mL of D50 and dilute with 40 mL of NS. Make D25 by removing 25 mL of D50 and dilute with 25 mL of NS.**
- In extreme circumstances with no IV and no response to glucagon Dextrose 50 % can be administered rectally. Contact medical control for advice.
- Quality control checks should be maintained per manufacturers recommendation for all glucometers.
- **Patient Refusal:**

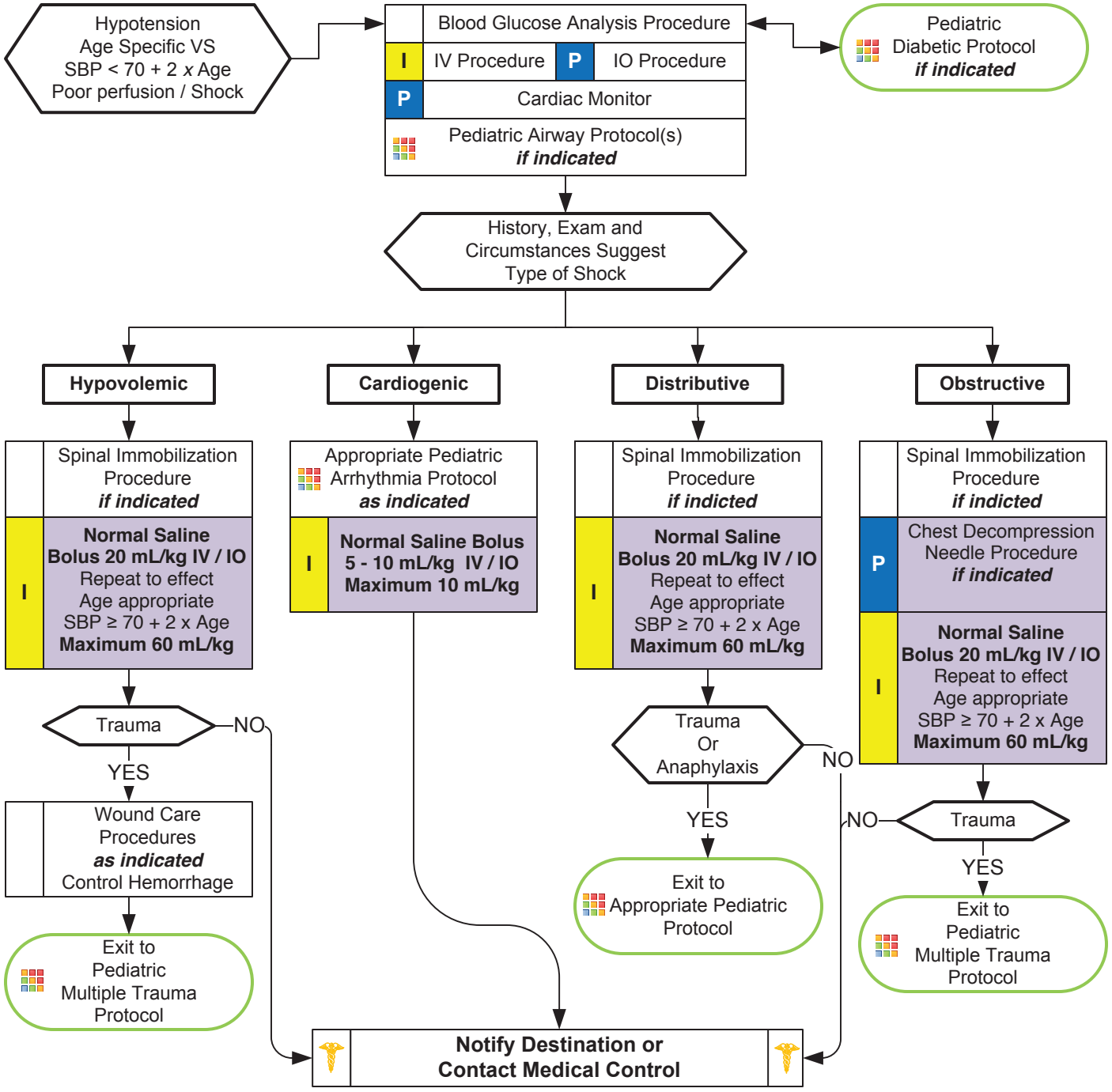
  Adult caregiver must be present with pediatric patient. Blood sugar must be 100 or greater and patient has ability to eat and availability of food with responders on scene. Patient must have known history of diabetes and not be taking any oral diabetic agents. Otherwise contact medical control.

# Pediatric Hypotension / Shock

## History
- Blood loss
- Fluid loss
- Vomiting
- Diarrhea
- Fever
- Infection

## Signs and Symptoms
- Restlessness, confusion, weakness
- Dizziness
- Tachycardia
- Hypotension (Late sign)
- Pale, cool, clammy skin
- Delayed capillary refill
- Dark-tarry stools

## Differential
- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin




Pediatric Medical Section Protocols

# Hypotension / Shock



## Pearls

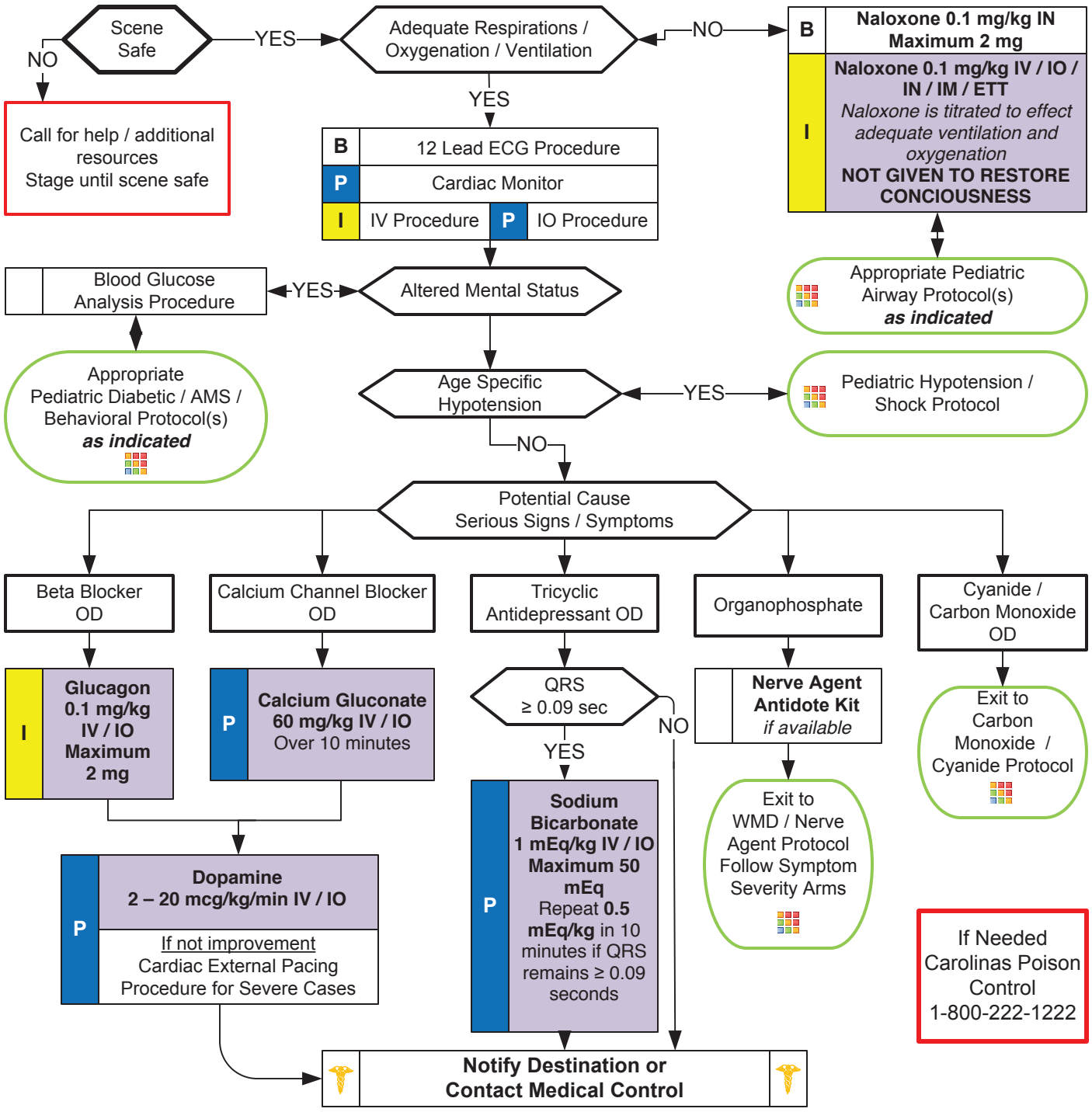
- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.**
- **Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.**
- **Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.**
- **Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Hypovolemic Shock:**
  Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
- **Cardiogenic Shock:**
  Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical / septum / valve / toxins.
- **Distributive Shock:**
  Sepsis
  Anaphylactic
  Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
  Toxins
- **Obstructive Shock:**
  Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
  Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency:** State where body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary adrenal disease or more commonly have stopped a steroid like prednisone. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. If suspected EMT-P should give **Methylprednisolone 2 mg/kg IV / IO** or **Dexamethasone 0.3 mg/kg (Maximum 10 mg) IV / IO**. Use agency-specific steroid.

# Pediatric Overdose / Toxic Ingestion

## History
- Ingestion or suspected ingestion of potentially toxic substance
- Substance ingested, route, quantity
- Time of Ingestion is important
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications, past psychiatric history

## Signs and Symptoms
- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- **S**alivation, **L**acrimation, **U**rination; increased, loss of control, **D**efecation / Diarrhea, **G**I Upset; Abdominal pain / cramping, **E**mesis, **M**uscle Twitching

## Differential
- Tricyclic antidepressants
- Acetaminophen
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)




Pediatric Medical Section Protocols

# Pediatric Overdose / Toxic Ingestion



PEARLS:

* EMT-B medication table for naloxone (narcan): (weight in pounds to dose to administer) (2.2 pounds = 1 kilogram)

5 pounds - 0.2 mg
10 pounds - 0.4 mg
20 pounds - 1 mg
25 pounds - 1.25 mg
30 pounds - 1.5 mg
40 pounds - 2 mg



## Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons. Bring bottles, contents, emesis to ED.**
- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.**
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin**: Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures
- **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- Consider contacting the North Carolina Poison Control Center for guidance.

# Pediatric Respiratory Distress

NCCEP

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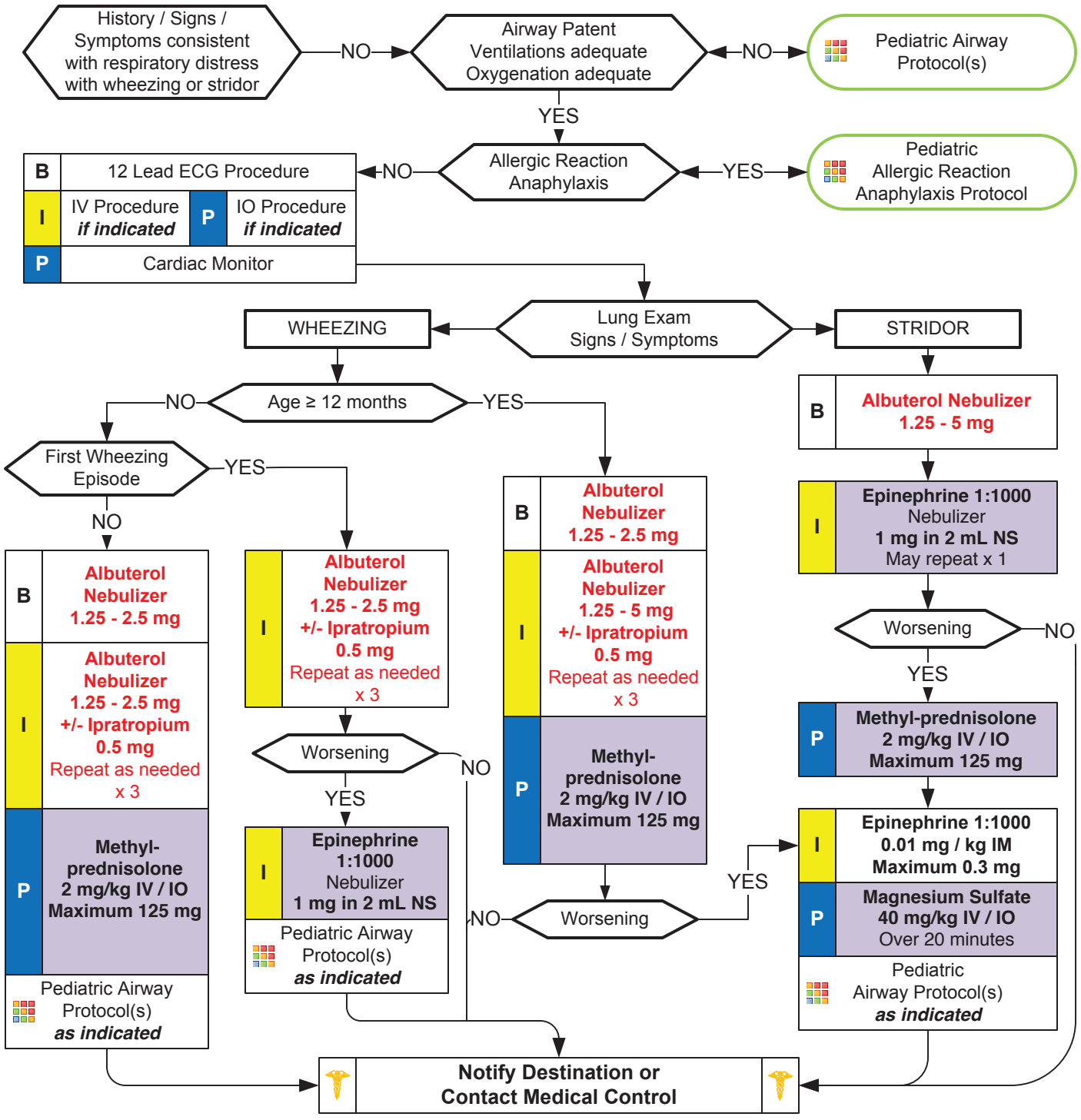
## History
- Time of onset
- Possibility of foreign body
- Past Medical History
- Medications
- Fever / Illness
- Sick Contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

## Signs and Symptoms
- Wheezing / Stridor / Crackles / Rales
- Nasal Flaring / Retractions / Grunting
- Increased Heart Rate
- AMS
- Anxiety
- Attentiveness / Distractability
- Cyanosis
- Poor feeding
- JVD / Frothy Sputum
- Hypotension

## Differential
- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma




Pediatric Medical Section Protocols

# Pediatric Respiratory Distress



PEARLS:

* EMT-B may administer Albuterol if patient already prescribed and may administer from EMS supply. Medical Director does not require medical control contact prior to administration.



## Pearls

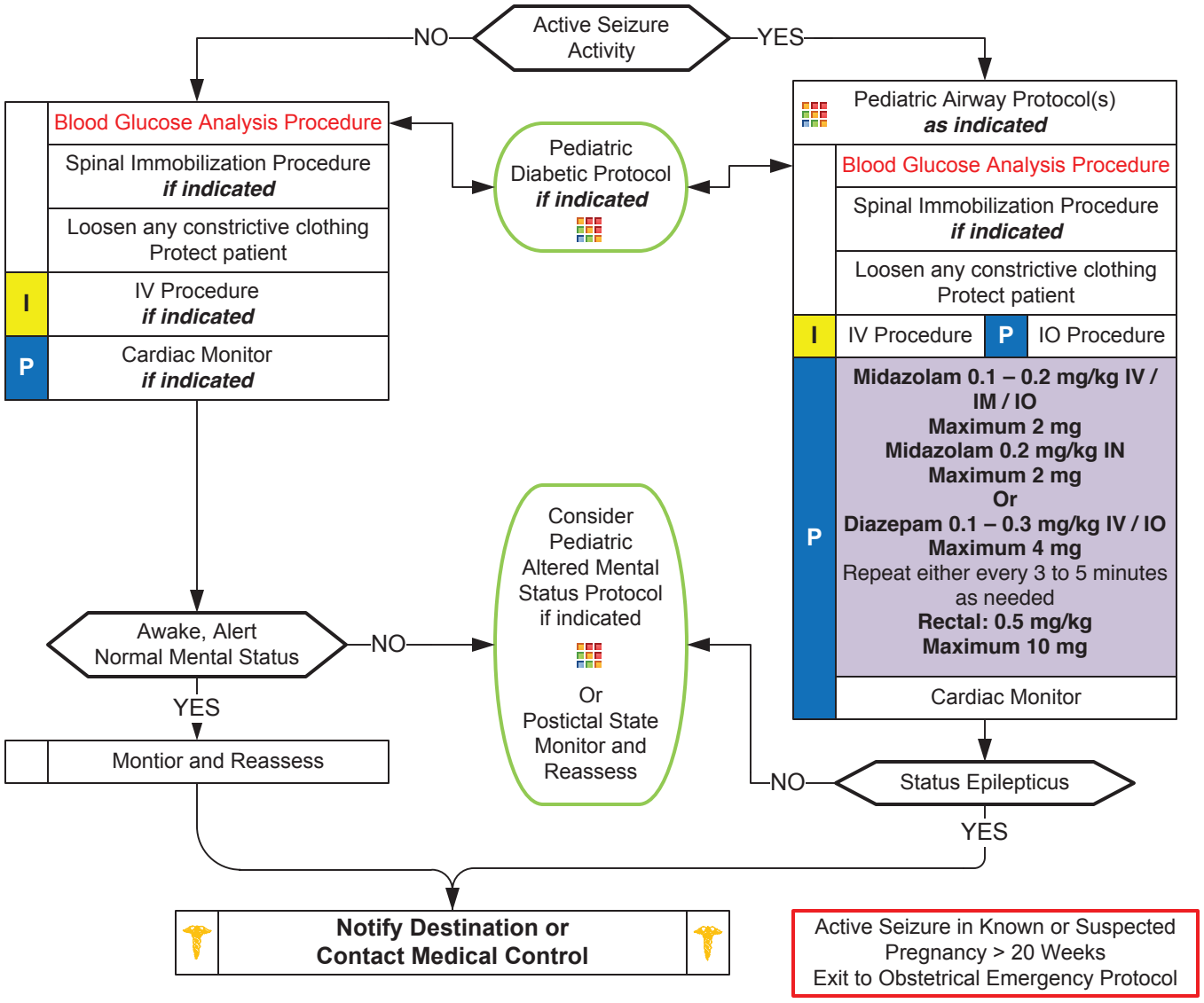
- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **Pulse oximetry should be monitored continuously in the patient with respiratory distress.**
- **EMT-B may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency medical director may require Contact of Medical Control prior to administration.
- **Albuterol dosing: ≤ 1 year of age 1.25 mg; 1 – 6 years 1.25 – 2.5 mg; 6 – 14 years 2.5 mg; ≥ 15 years 2.5 – 5 mg.**
- **Consider IV access when Pulse oximetry remains ≤ 92 % after first beta agonist treatment.**
- Do not force a child into a position, allow them to assume position of comfort. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control.
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to beta-agonists. Consider Epinephrine nebulizer if patient < 18 months and not responding to initial beta-agonist treatment.
- Croup typically affects children < 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted.
- Epiglottitis typically affects children > 2 years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, drooling is common. Airway manipulation may worsen the condition.
- In patients using levalbuterol (Xopenex) you may use Albuterol for the first treatment then use the patient's supply for repeat nebulizers or agency's supply.

# Pediatric Seizure

## History
- Fever
- Sick contacts
- Prior history of seizures
- Medication compliance
- Recent head trauma
- Whole body vs unilateral seizure activity
- Duration, Single/multiple
- Congenital Abnormality

## Signs and Symptoms
- Fever; hot, dry skin
- Seizure activity
- Incontinence
- Tongue trauma
- Rash
- Nuchal rigidity
- Altered mental status

## Differential
- Febrile seizure
- Infection
- Head trauma
- Medication or Toxin
- Hypoxia or Respiratory failure
- Hypoglycemia
- Metabolic abnormality / acidosis
- Tumor




Pediatric Medical Section Protocols

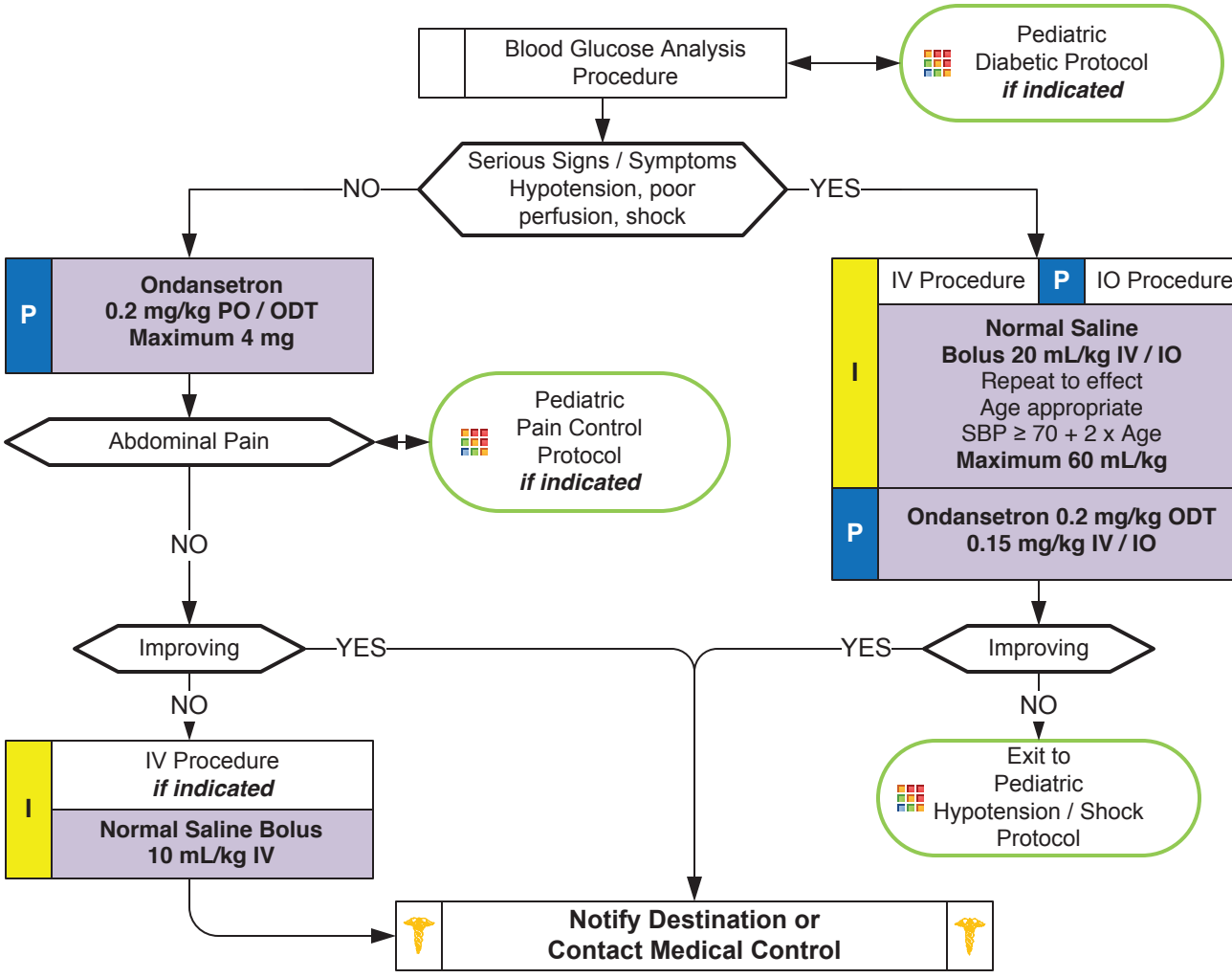
## Pearls
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Midazolam 0.2 mg/kg (Maximum 10 mg) IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- Addressing the ABCs and verifying blood glucose is as important than stopping the seizure.
- Be prepared to assist ventilations especially if a benzodiazepine is used. Avoiding hypoxemia is extremely important.
- In an infant, a seizure may be the only evidence of a closed head injury.
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- Assess possibility of occult trauma and substance abuse, overdose or ingestion / toxins and fever.

# Pediatric Vomiting / Diarrhea

## History
- Age
- Time of last meal
- Last bowel movement / emesis
- Improvement or worsening with food or activity
- Other sick contacts
- Past Medical History
- Past Surgical History
- Medications
- Travel history
- Bloody Emesis or diarrhea

## Signs and Symptoms
- Pain
- Distension
- Constipation
- Diarrhea
- Anorexia
- Fever
- Cough,
- Dysuria

## Differential
- CNS (Increased pressure, headache, tumor, trauma or hemorrhage)
- Drugs
- Appendicitis
- Gastroenteritis
- GI or Renal disorders
- Diabetic Ketoacidosis
- Infections (pneumonia, influenza)
- Electrolyte abnormalities




Pediatric Medical Section Protocols

## Pearls
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.**
- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.**
- Beware of vomiting only in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.

# Pediatric Head Trauma

NCCEP

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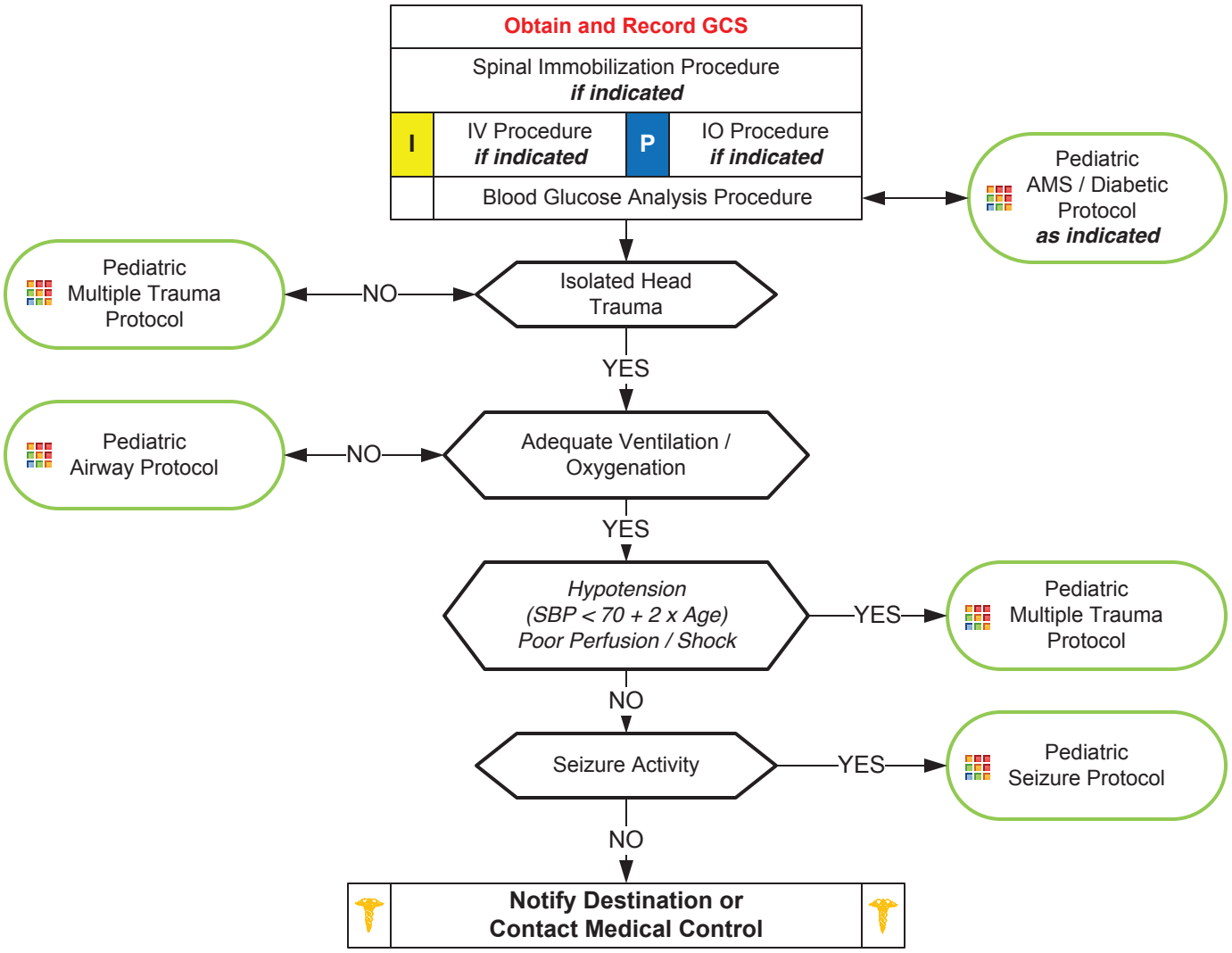
## History
- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

## Signs and Symptoms
- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

## Differential
- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse




Pediatric Trauma and Burn Section Protocols

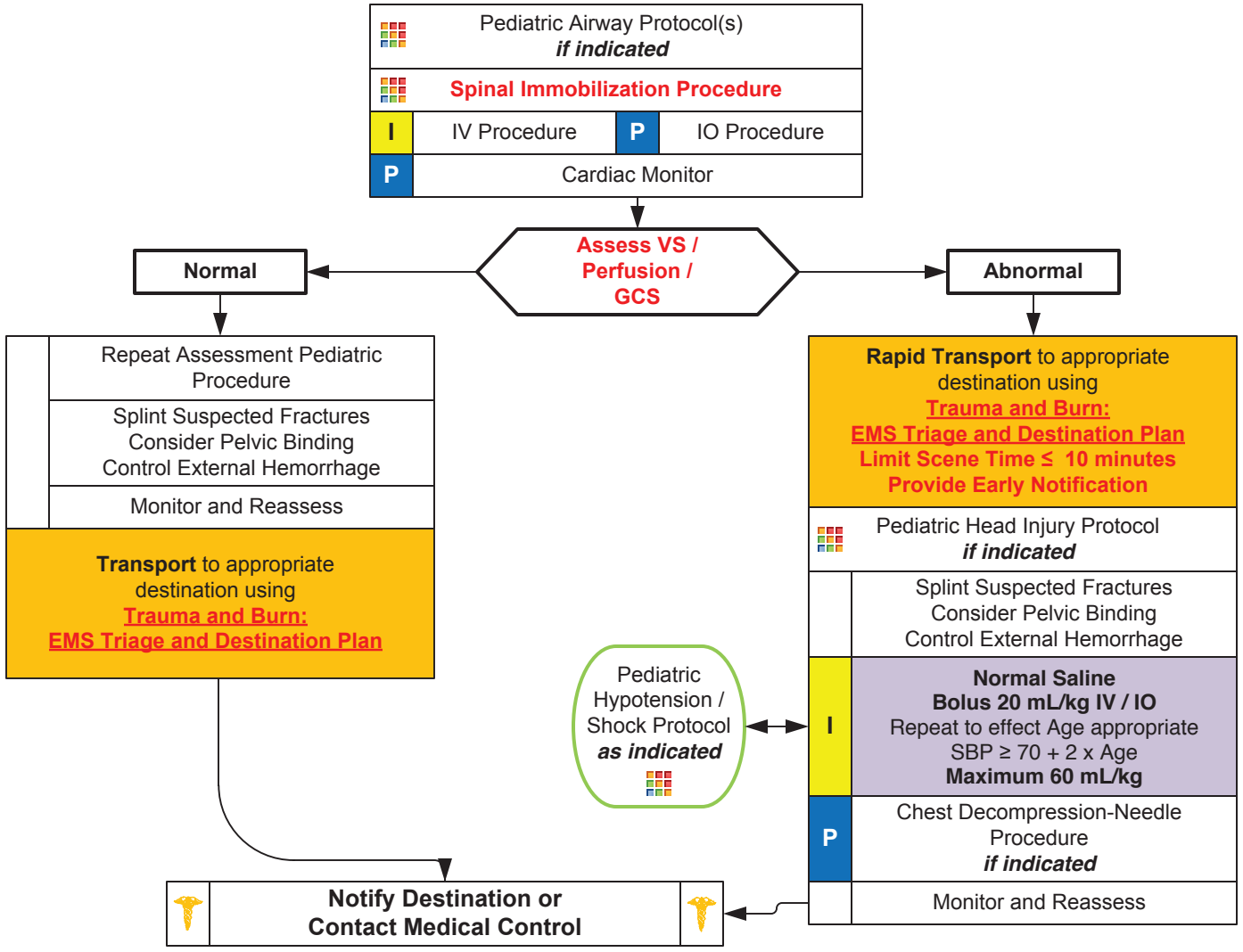
## Pearls
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **GCS is a key performance measure used to evaluate protocol compliance and care**
- **If GCS < 12 consider air / rapid transport and if GCS < 9 intubation should be anticipated.**
- **Hyperventilate the patient only if evidence of herniation (blown pupil, decorticate / decerebrate posturing, bradycardia, decreasing GCS). If hyperventilation is needed (35 / minute for infants <1 year and 25 / minute for children >1 year) EtCO2 should be maintained between 30 - 35 mmHg.**
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively.
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Concussions are traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache. Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.
- Fluid resuscitation should be titrated to maintain at least a systolic BP of > 70 + 2 x the age in years.

# Pediatric Multiple Trauma

## History
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

## Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

## Differential
- Chest: Tension pneumothorax, Flail chest, Hemothorax, Pericardial tamponade, Open chest wound
- Intra-abdominal bleeding
- Pelvis / Femur / Spine fracture, cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia




## Pearls
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained ≥ 90%**
- Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.
- Consider Chest Decompression with signs of shock and injury to torso and evidence of tension pneumothorax.
- See Regional Trauma Guidelines when declaring Trauma Activation.
- Severe bleeding from an extremity not rapidly controlled with direct pressure may necessitate the application of a tourniquet.
- Do not overlook the possibility of child abuse.

# Pediatric Thermal Burn

**History**
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

**Signs and Symptoms**
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

**Differential**
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal
- Chemical – Electrical

Assess Burn / Concomitant Injury Severity

## Minor Burn

**< 5% TBSA 2nd/3rd Degree Burn**
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater

- Remove Rings, Bracelets / Constricting Items
- Dry Clean Sheet or Dressings
- Pediatric Multiple Trauma Protocol ***if indicated***
- Pediatric Airway Protocol(s) ***as indicated***
- I: IV Procedure ***if indicated***
- I: **Normal Saline**
  **0.25 mL / kg ( x % TBSA) / hr**
  for up to the first 8 hours.
  ***(More info below)***
  ***Lactated Ringers if available***
- Pediatric Pain Control Protocol ***if indicated***

Carbon Monoxide / Cyanide Exposure
- YES → Carbon Monoxide / Cyanide Protocol
- NO → Transport Facility of Choice

## Serious Burn

**5-15% TBSA 2nd/3rd Degree Burn**
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
*(When reasonably accessible, transport to a Burn Center)*

## Criticial Burn

**>15% TBSA 2nd/3rd Degree Burn**
Burns with Multiple Trauma
Burns with definitive airway compromise
*(When reasonably accessible, transport to a Burn Center)*

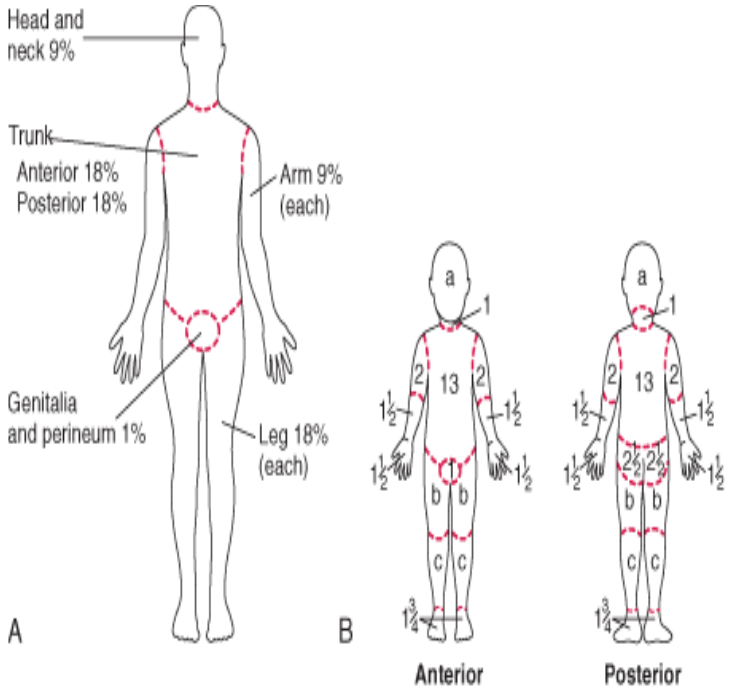
- Remove Rings, Bracelets / Constricting Items
- Dry Clean Sheet or Dressings
- Pediatric Multiple Trauma Protocol ***if indicated***
- Pediatric Airway Protocol(s) ***as indicated***
- I: IV Procedure
  Consider 2 IV sites if greater than 15 % TBSA
- I: **Normal Saline**
  **0.25 mL / kg ( x % TBSA) / hr**
  for up to the first 8 hours.
  ***(More info below)***
  ***Lactated Ringers if available***
- P: IO Procedure ***if indicated***
- Pediatric Pain Control Protocol ***if indicated***

Carbon Monoxide / Cyanide Exposure
- YES → Carbon Monoxide / Cyanide Protocol
- NO → **Rapid Transport** to appropriate destination using **Trauma and Burn: EMS Triage and Destination Plan**

**Notify Destination or Contact Medical Control**

***1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.***
***2. Formula example: an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.***

# Pediatric Thermal Burn




Relative percentage of body surface area (% BSA) affected by growth

| Body Part | Age 0 yr | 1 yr | 5 yr | 10 yr | 15 yr |
|---|---|---|---|---|---|
| a = 1/2 of head | 9 1/2 | 8 1/2 | 6 1/2 | 5 1/2 | 4 1/2 |
| b = 1/2 of 1 thigh | 2 3/4 | 3 1/4 | 4 | 4 1/4 | 4 1/2 |
| c = 1/2 of 1 lower leg | 2 1/2 | 2 1/2 | 2 3/4 | 3 | 3 1/4 |

## Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burn from those of partial (2nd) or full (3rd) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1st degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th 5th and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns.
- Other burn classifications in general include:
  - 4th referring to a burn that destroys the dermis and involves muscle tissue.
  - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Estimate spotty areas of burn by using the size of the patient's palm as 1 %

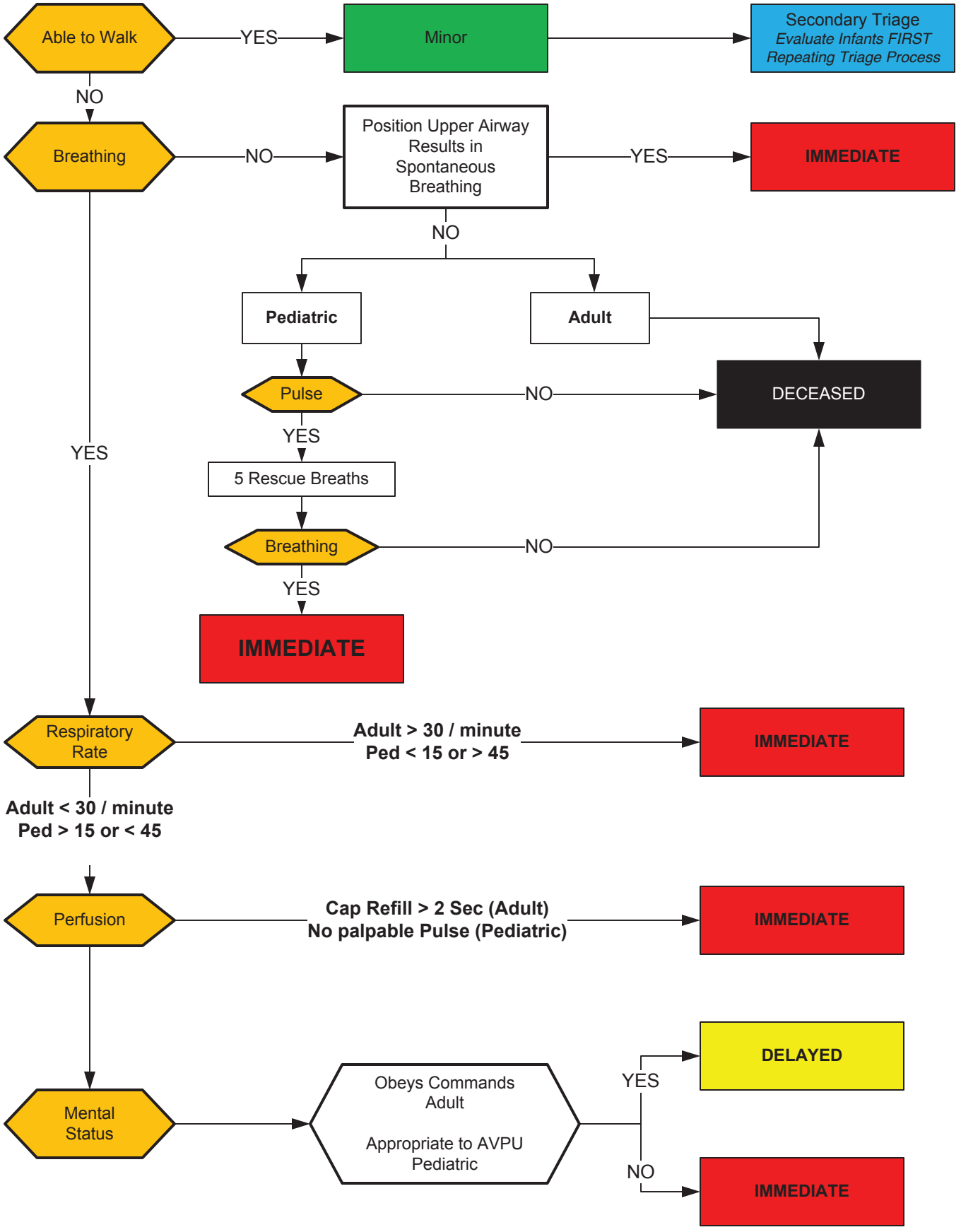
## Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**

**Critical or Serious Burns:**

- ***> 5-15% total body surface area (TBSA) 2nd or 3rd degree burns, or***
- ***3rd degree burns > 5% TBSA for any age group, or***
- ***circumferential burns of extremities, or***
- ***electrical or lightning injuries, or***
- ***suspicion of abuse or neglect, or***
- ***inhalation injury, or***
- ***chemical burns, or***
- ***burns of face, hands, perineum, or feet, or***
- ***any burn requiring hospitalization.***
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of child abuse with children and burn injuries.
- Never administer IM pain injections to a burn patient.

# Triage


Able to Walk
YES
Minor
Secondary Triage
Evaluate Infants FIRST
Repeating Triage Process
NO
Breathing
NO
Position Upper Airway Results in Spontaneous Breathing
YES
IMMEDIATE
NO
Pediatric
Adult
Pulse
NO
DECEASED
YES
5 Rescue Breaths
Breathing
NO
YES
IMMEDIATE
YES
Respiratory Rate
Adult > 30 / minute
Ped < 15 or > 45
IMMEDIATE
Adult < 30 / minute
Ped > 15 or < 45
Perfusion
Cap Refill > 2 Sec (Adult)
No palpable Pulse (Pediatric)
IMMEDIATE
Mental Status
Obeys Commands Adult
Appropriate to AVPU Pediatric
YES
DELAYED
NO
IMMEDIATE

# Triage





**Pearls**

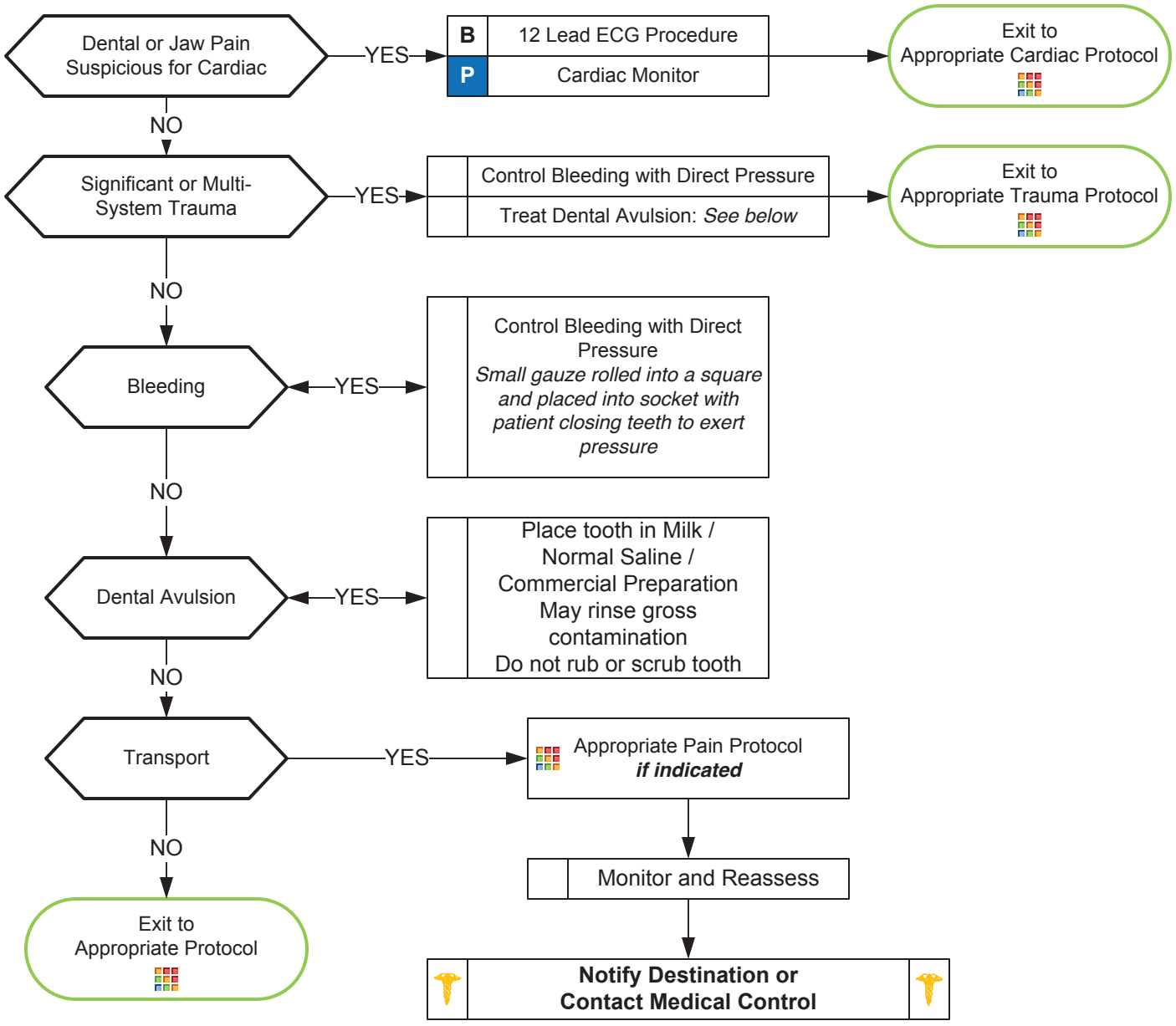
- First evaluate all children who did not walk under their on power where possible and safety allows.
- Capillary refill can be altered by many factors including skin temperature. Age-appropriate heart rate may also be used in triage decisions.

# Dental Problems

## History
- Age
- Past medical history
- Medications
- Onset of pain / injury
- Trauma with "knocked out" tooth
- Location of tooth
- Whole vs. partial tooth injury

## Signs and Symptoms
- Bleeding
- Pain
- Fever
- Swelling
- Tooth missing or fractured

## Differential
- Decay
- Infection
- Fracture
- Avulsion
- Abscess
- Facial cellulitis
- Impacted tooth (wisdom)
- TMJ syndrome
- Myocardial infarction




Adult / Pediatric General Section Protocols

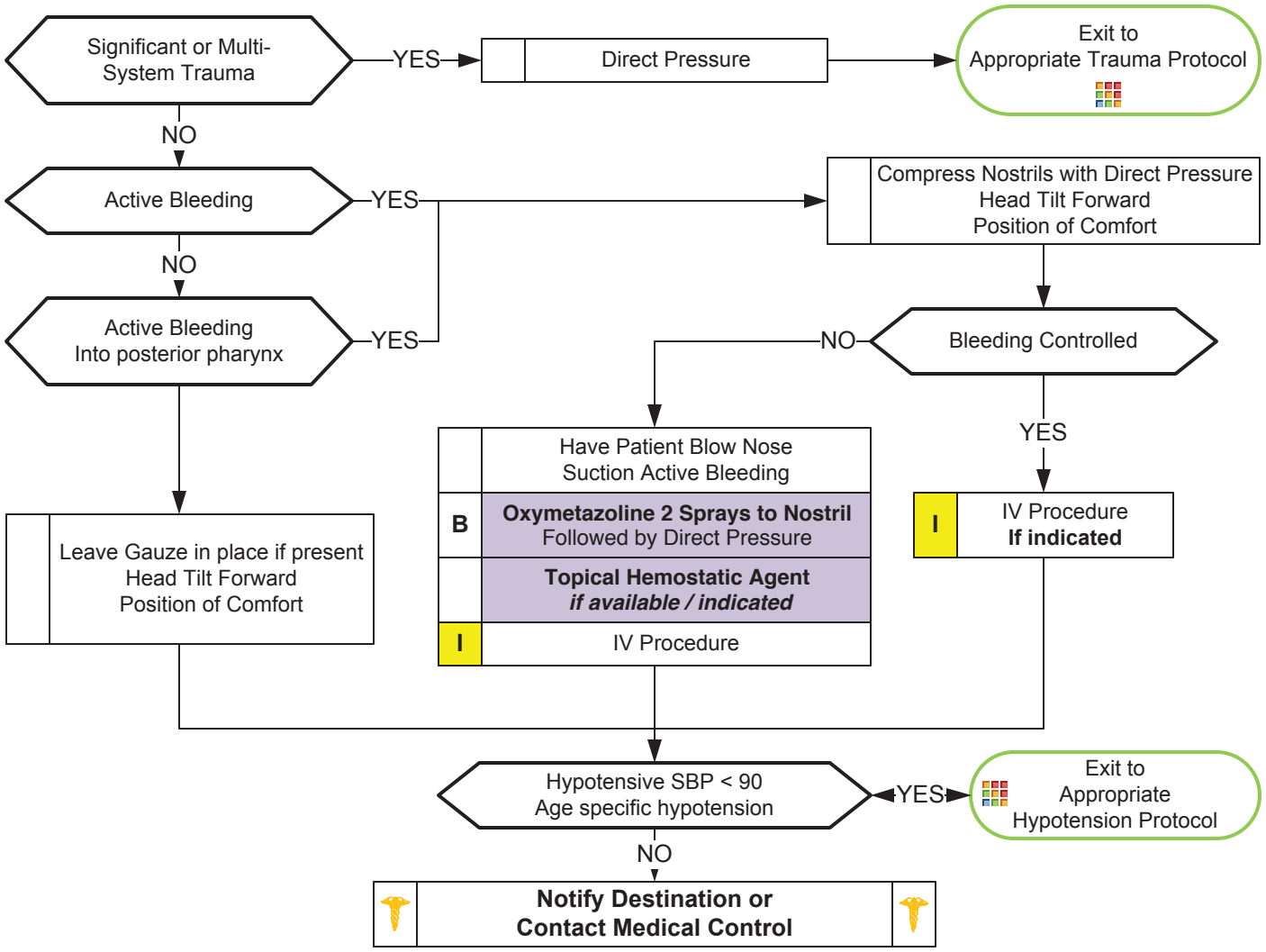
## Pearls
- **Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Neuro**
- Significant soft tissue swelling to the face or oral cavity can represent a cellulitis or abscess.
- Scene and transport times should be minimized in complete tooth avulsions. Reimplantation is possible within 4 hours if the tooth is properly cared for.
- Occasionally cardiac chest pain can radiate to the jaw.
- All pain associated with teeth should be associated with a tooth which is tender to tapping or touch (or sensitivity to cold or hot).

# Epistaxis

## History
- Age
- Past medical history
- Medications (HTN, anticoagulants, aspirin, NSAIDs)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

## Signs and Symptoms
- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

## Differential
- Trauma
- Infection (viral URI or Sinusitis)
- Allergic rhinitis
- Lesions (polyps, ulcers)
- Hypertension




## Pearls
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Avoid Afrin in patients who have a blood pressure of greater than 110 diastolic or known coronary artery disease.**
- Age specific hypotension: 0 – 28 days < 60 mmHg, 1 month – 1 year < 70 mmHg, 1 year – 10 years < 70 + ( 2 x age)mmHg, 11 years and greater < 90 mmHg.
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharnyx.
- Anticoagulants include warfarin (Coumadin), heparin, enoxaparin (Lovenox), dabigatran (Pradaxa), rivaroxaban (Xarelto), and many over the counter headache relief powders.
- Anti-platelet agents like aspirin, clopidogrel (Plavix), aspirin/dipyridamole (Aggrenox), and ticlopidine (Ticlid) can contribute to bleeding.

# Fever / Infection Control

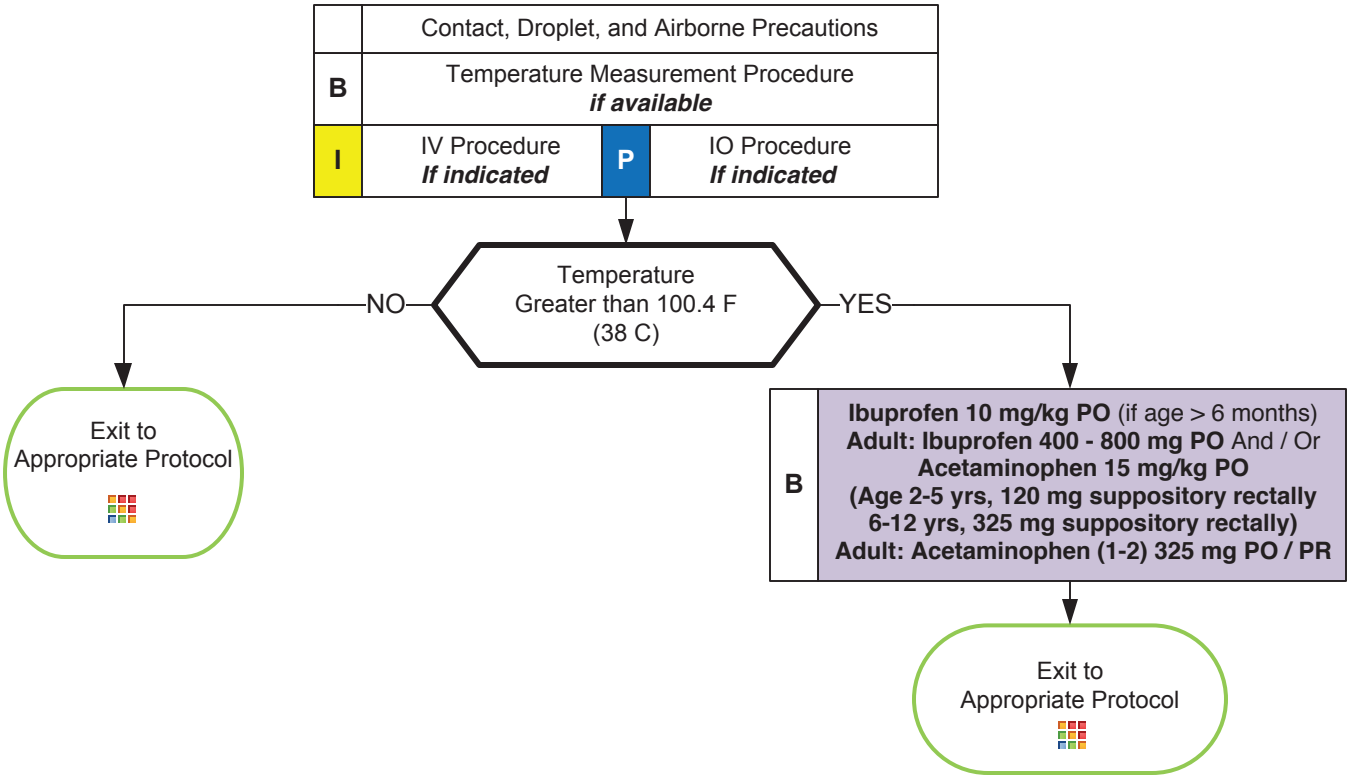
## History
- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Last acetaminophen or ibuprofen

## Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills/Rigors

**Associated Symptoms (Helpful to localize source)**
- myalgias, cough, chest pain, headache, dysuria, abdominal pain, mental status changes, rash

## Differential
- Infections / Sepsis
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease
  - Arthritis
  - Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis





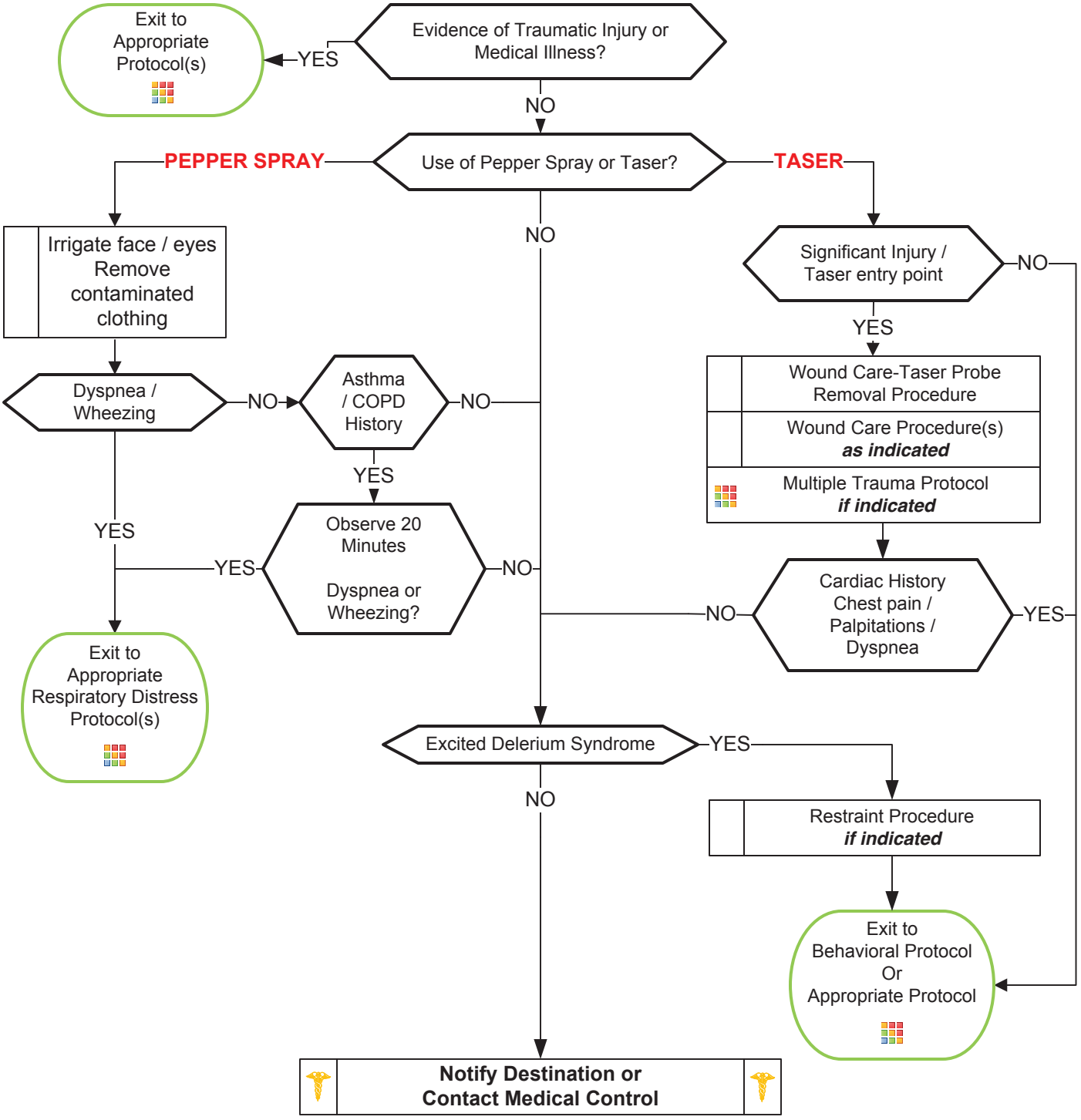

## Pearls
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions** include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions** include standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- Rehydration with fluids increased the patients ability to sweat and improves heat loss.
- All patients should have drug allergies documented prior to administering pain medications.
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen.
- NSAIDs should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child.
- Agency Medical Director may require contact of medical control prior to EMT-B / MR administering any medication.

# Police Custody

## History
- Traumatic Injury
- Drug Abuse
- Cardiac History
- History of Asthma
- Psychiatric History

## Signs and Symptoms
- External signs of trauma
- Palpitations
- Shortness of breath
- Wheezing
- Altered Mental Status
- Intoxication/Substance Abuse

## Differential
- Agitated Delirium Secondary to Psychiatric Illness
- Agitated Delirium Secondary to Substance Abuse
- Traumatic Injury
- Closed Head Injury
- Asthma Exacerbation
- Cardiac Dysrhythmia




Adult / Pediatric General Section Protocols

# Police Custody



## Pearls

- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- Local EMS agencies should formulate a policy with local law enforcement agencies concerning patients requiring EMS and Law Enforcement simultaneously. Agencies should work together to formulate a disposition in the best interest of the patient.
- **Patients restrained by law enforcement devices must be transported accompanied by a law enforcement officer in the patient compartment who is capable of removing the devices. However when rescuers have utilized restraints in accordance with Restraint Procedure, the law enforcement agent may follow behind the ambulance during transport.**
- The responsibility for patient care rests with the highest authorized medical provider on scene per North Carolina law.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- All patients in police custody retain the right to participate in decision making regarding their care and may request care of EMS.
- If extremity / chemical / law enforcement restraints are applied, follow Restraint Procedure.
- **Consider Haldol or Ziprasidone for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- **Excited Delirium Syndrome:**

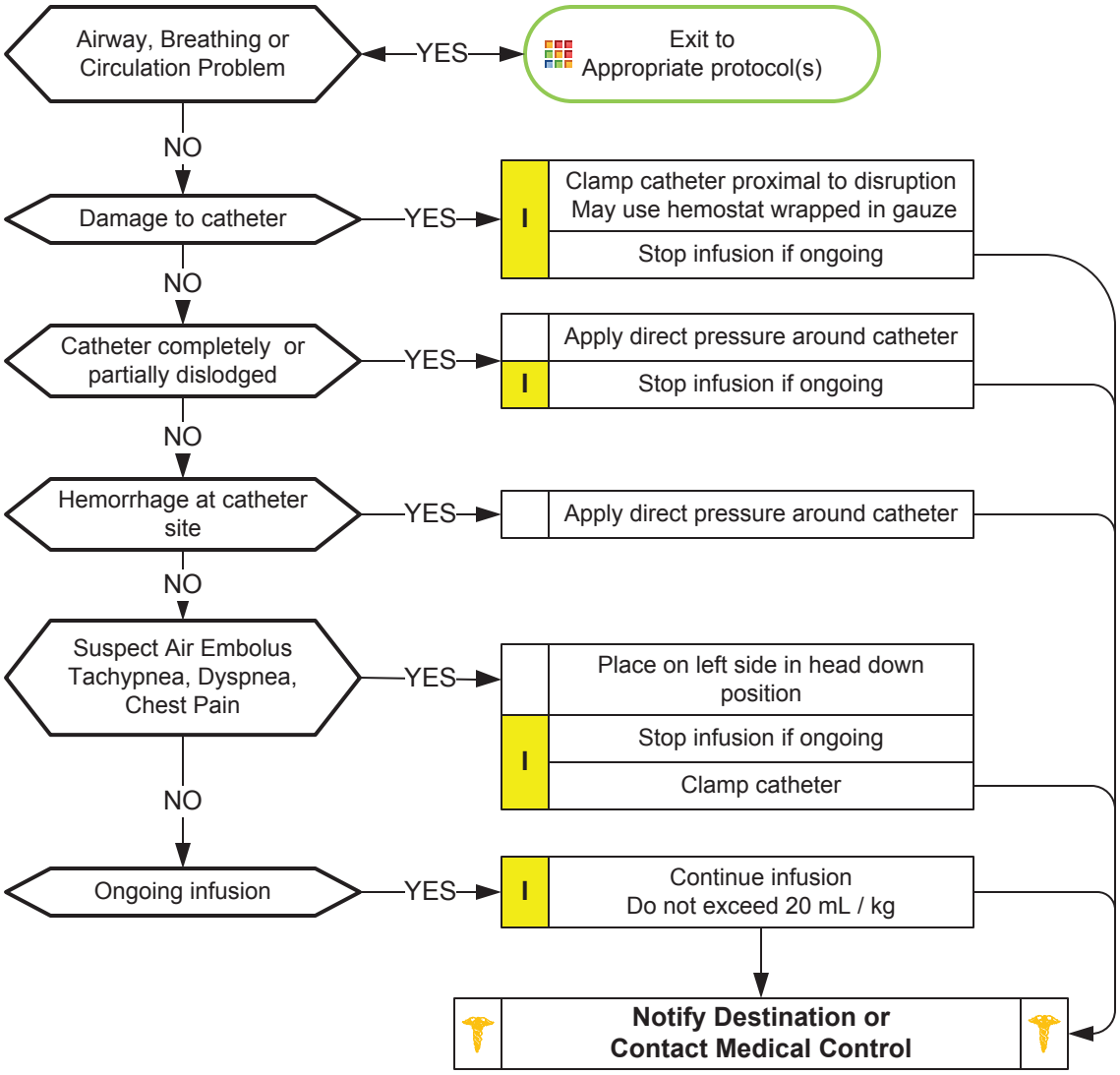
  Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers.
  Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
- If patient is suspected of excited delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.

# Emergencies Involving Indwelling Central Lines

## History
- Central Venous Catheter Type
  - Tunneled Catheter (Broviac / Hickman)
  - PICC (peripherally inserted central catheter
  - Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

## Signs and Symptoms
- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter site
- Internal bleeding
- Blood clot
- Air embolus
- Erythema, warmth or drainage about catheter site indicating infection

## Differential
- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock




Adult / Pediatric General Section Protocols

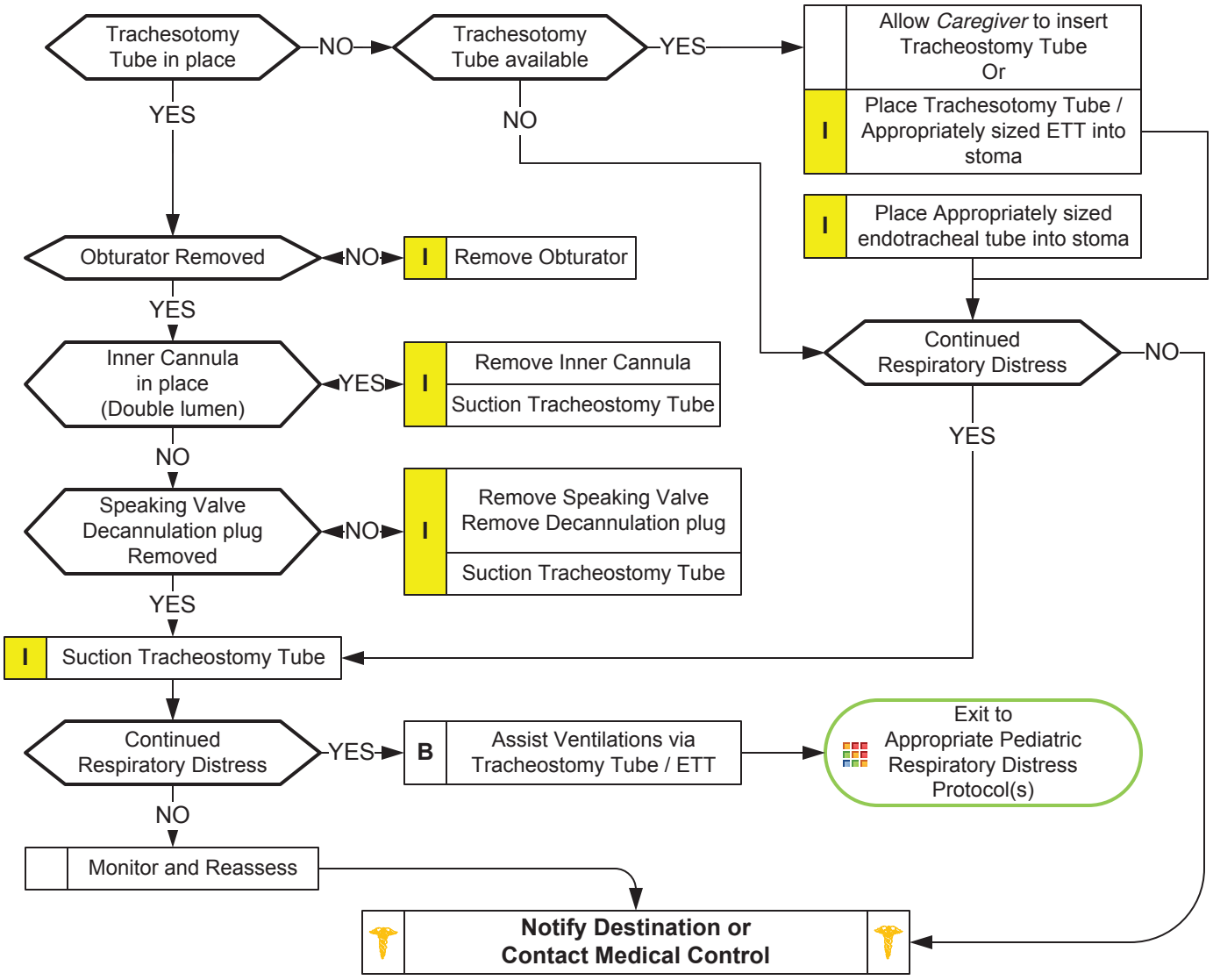
## Pearls
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Use strict sterile technique when accessing / manipulating an indwelling catheter.
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Cardiac arrest: Access central catheter and utilize if functioning properly.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.

# Respiratory Distress With a Tracheostomy Tube

## History
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (accidental damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchial or pulmonary dysplasia, muscular dystrophy)

## Signs and Symptoms
- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions noted coming out of the tube
- Faint breath sounds on both sides of chest despite significant respiratory effort
- AMS
- Cyanosis

## Differential
- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma




Adult / Pediatric General Section Protocols

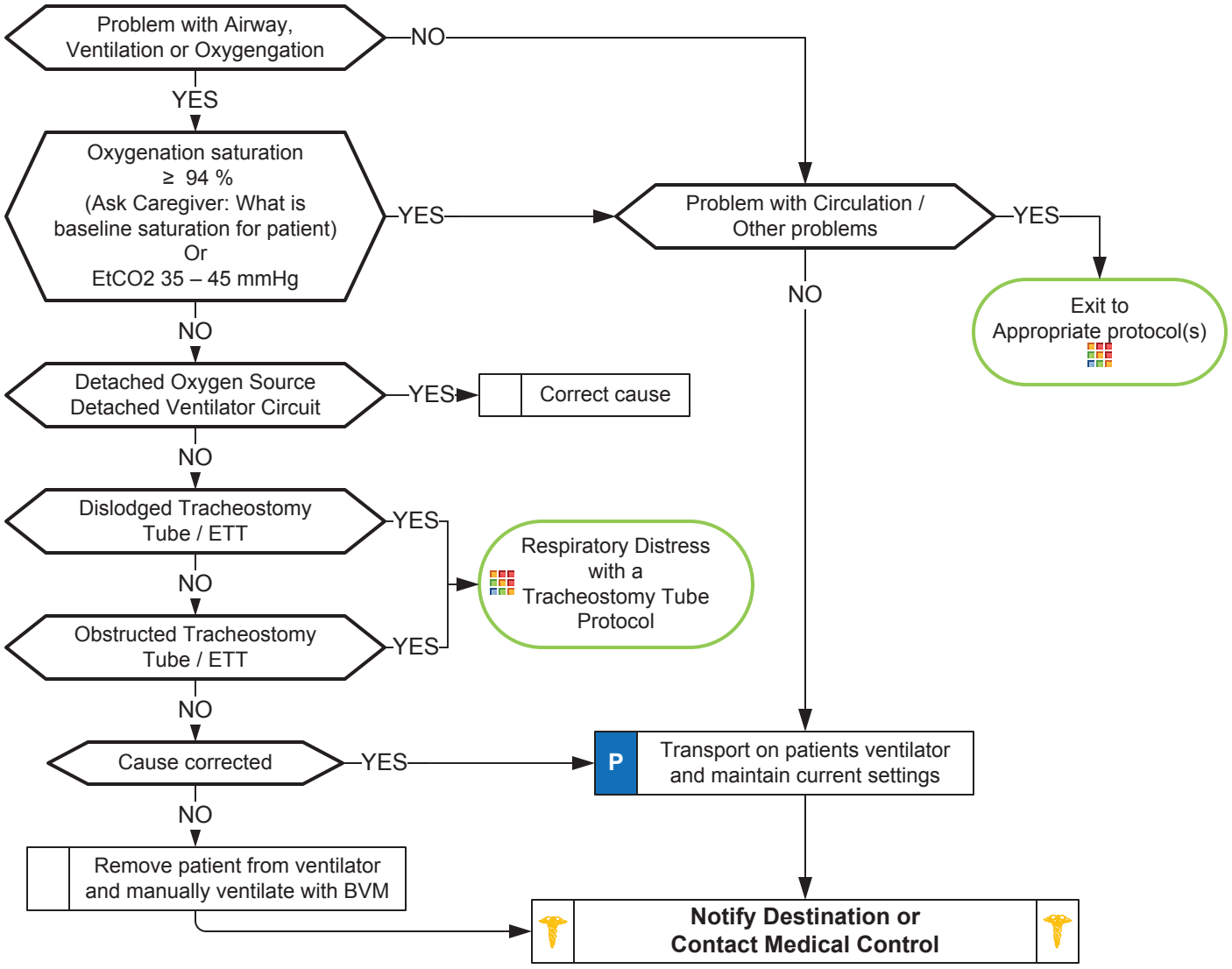
## Pearls
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Use patients equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family / caregiver. No more than 3 to 6 cm typically. Instill 2 – 3 mL of NS before suctioning.
- Do not suction more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Continual pulse oximetry and EtCO2 monitoring if available.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

# Emergencies Involving Ventilators

## History
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchopulmonary dysplasia, muscular dystrophy)

## Signs and Symptoms
- Transport requiring maintenance of a mechanical ventilator
- Power or equipment failure at residence

## Differential
- Disruption of oxygen source
- Dislodged or obstructed tracheostomy tube
- Detached or disrupted ventilator circuit
- Cardiac arrest
- Increased oxygen requirement / demand
- Ventilator failure




Adult / Pediatric General Section Protocols

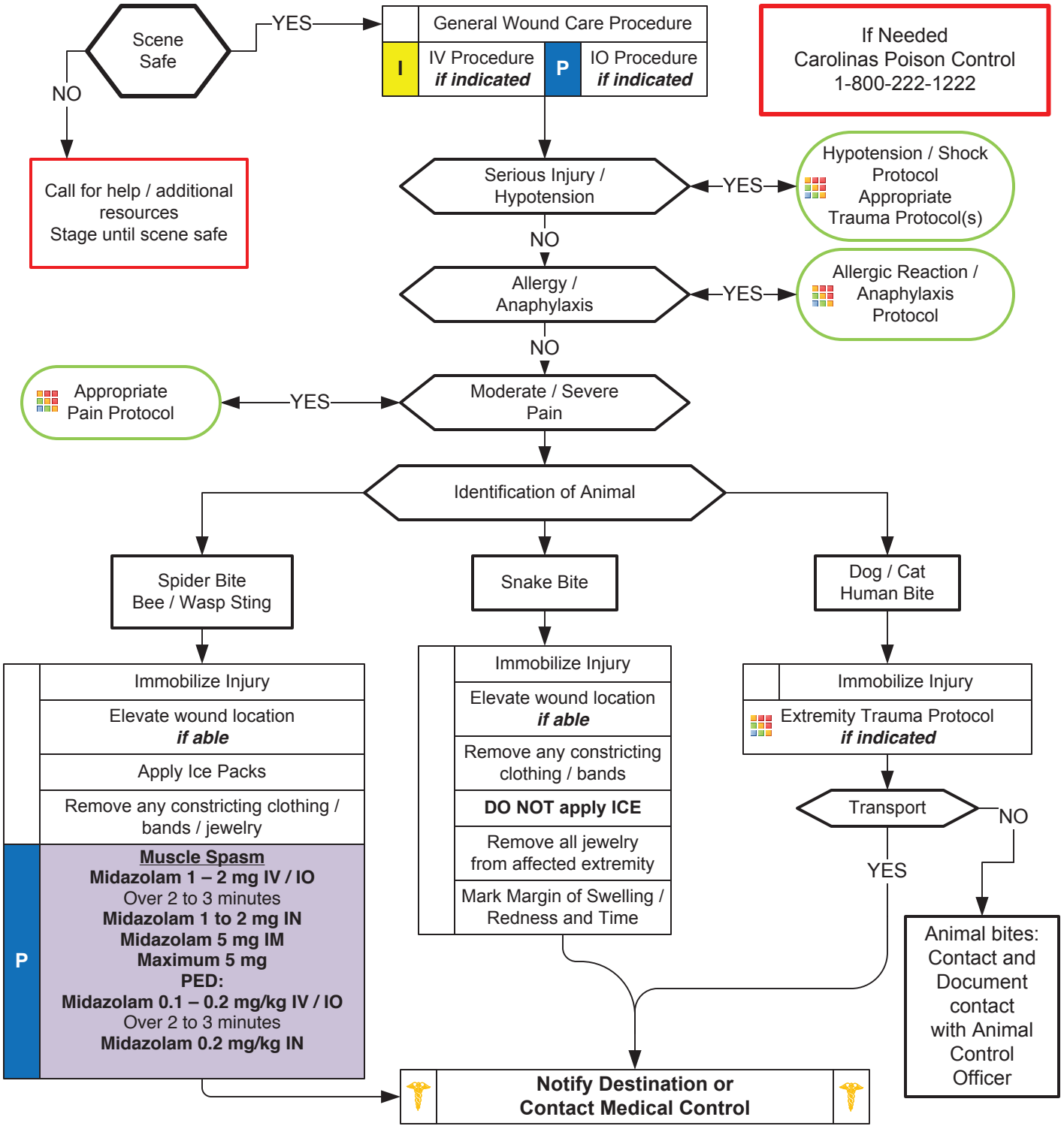
## Pearls
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- Always use patient's equipment if available and functioning properly.
- Continuous pulse oximetry and end tidal CO2 monitoring must be utilized during assessment and transport.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.
- Unable to correct ventilator problem: Remove patient from ventilator and manually ventilate using BVM. Take patient's ventilator to hospital even if not functioning properly.
- Typical alarms: Low Pressure / Apnea: Loose or disconnected circuit, leak in circuit or around tracheostomy site.
  Low Power: Internal battery depleted.
  High Pressure: Plugged / obstructed airway or circuit.

# Bites and Envenomations

## History
- Type of bite / sting
- Description or bring creature / photo with patient for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

## Signs and Symptoms
- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

## Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk




Adult / Pediatric Environmental Section Protocols

# Bites and Envenomations





**Pearls**

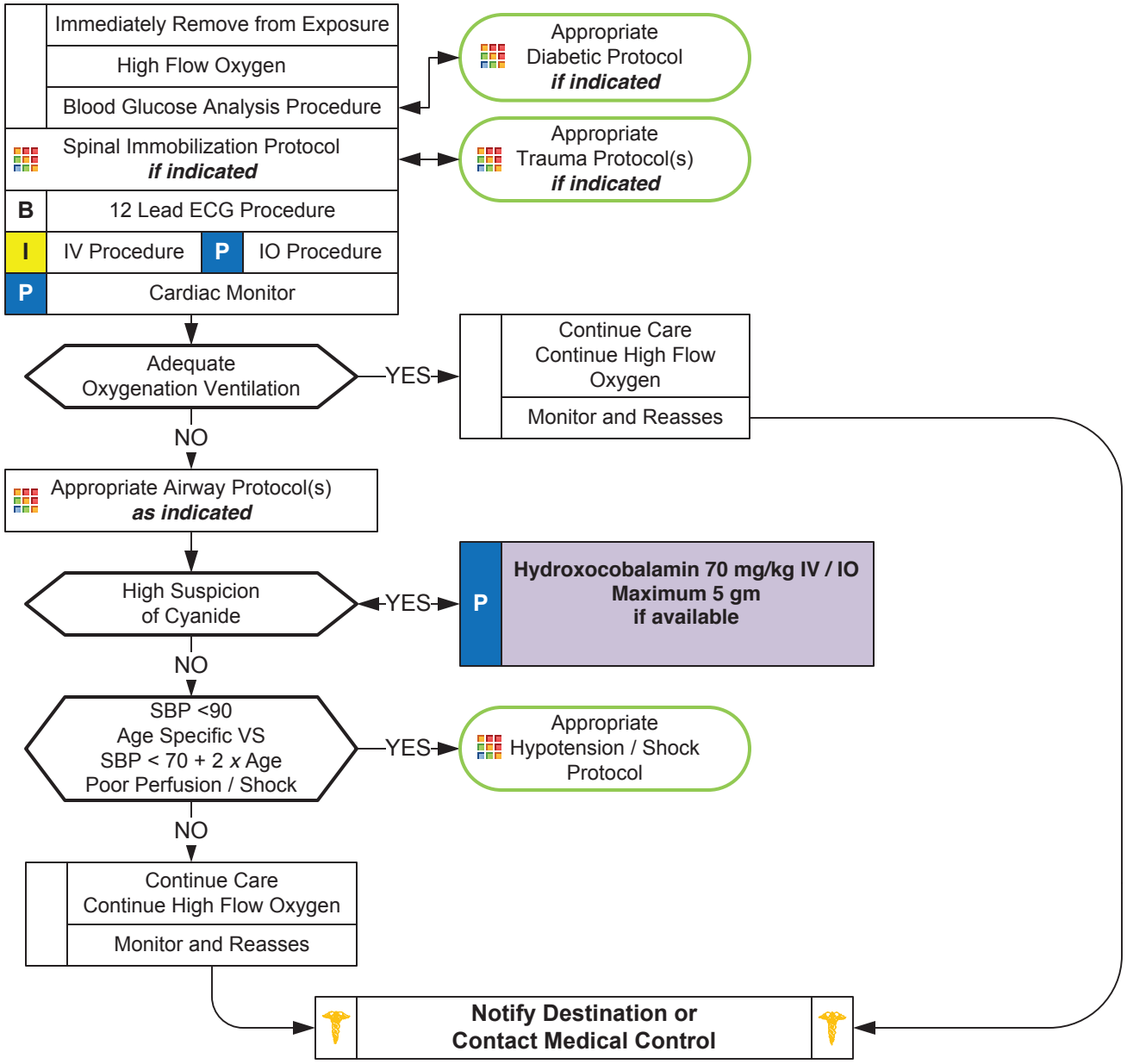
- **Recommended Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neuro exam if systemic effects are noted**
- Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria (Pasteurella multicoda).
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead.
- Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
- Amount of envenomation is variable, generally worse with larger snakes and early in spring.
- If no pain or swelling, envenomation is unlikely. About 25 % of snake bites are “dry” bites.
- Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplant patients.
- Consider contacting the North Carolina Poison Control Center for guidance (1-800-84-TOXIN).

# Carbon Monoxide / Cyanide

**History**
- Smoke inhalation
- Ingestion of cyanide
- Eating large quantity of fruit pits
- Industrial exposure
- Trauma
- Reason: Suicide, criminal, accidental
- Past Medical History
- Time / Duration of exposure

**Signs and Symptoms**
- AMS
- Malaise, weakness, flu like illness
- Dyspnea
- GI Symptoms; N/V; cramping
- Dizziness
- Seizures
- Syncope
- Reddened skin
- Chest pain

**Differential**
- Diabetic related
- Infection
- MI
- Anaphylaxis
- Renal failure / dialysis problem
- Head injury / trauma
- Co-ingestant or exposures



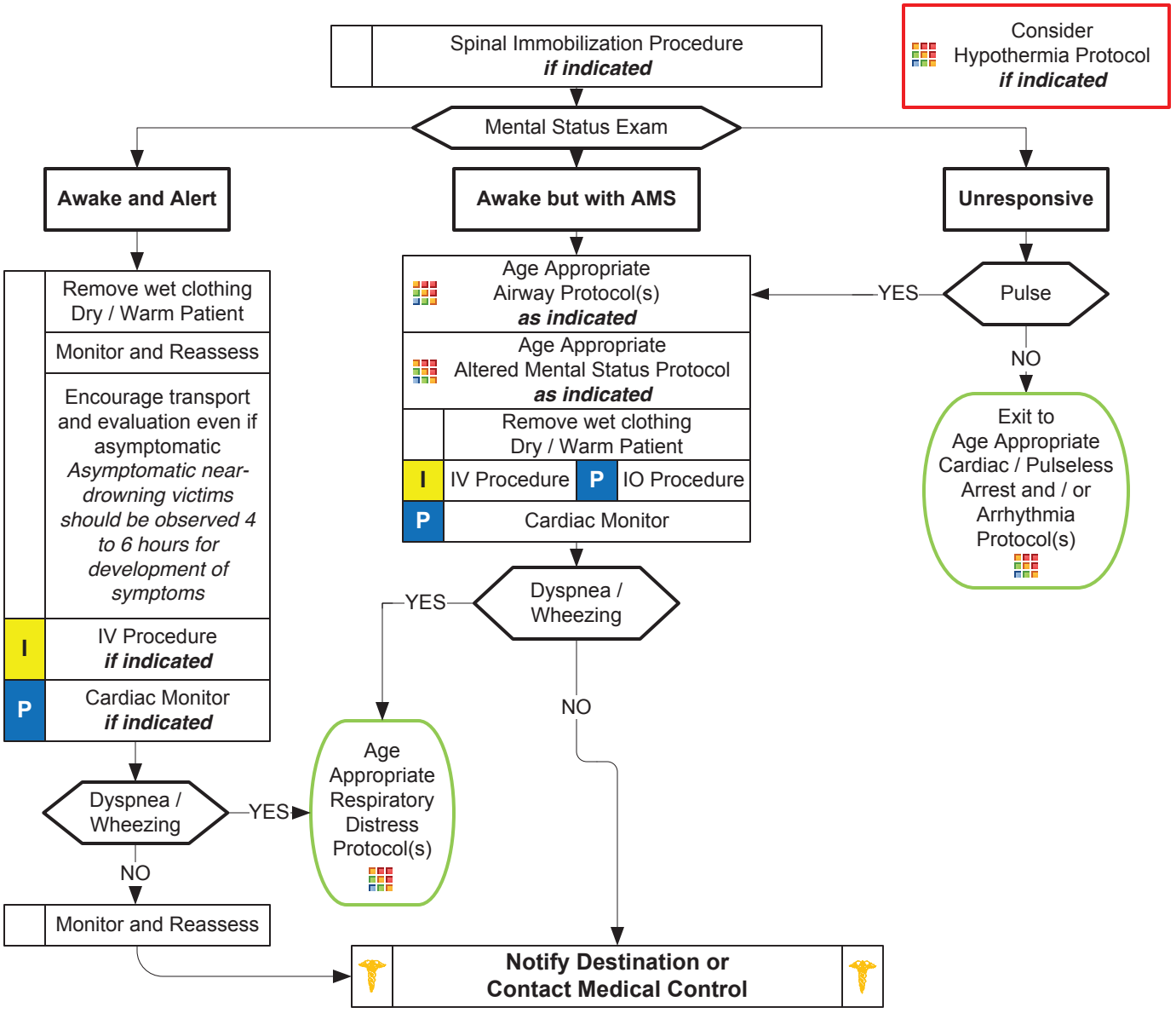

**Pearls**
- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority.**
- Consider CO and Cyanide with any product of combustion
- Normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse ox readings.

# Drowning / Submersion Injury

## History
- Submersion in water regardless of depth
- Possible history of trauma ie: diving board
- Duration of immersion
- Temperature of water or possibility of hypothermia
- Degree of water contamination

## Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing, Wheezing, Rales, Rhonci,Stridor
- Apnea

## Differential
- Trauma
- Pre-existing medical problem
- Pressure injury (diving)
- Barotrauma
- Decompression sickness
- Post-immersion syndrome




Adult / Pediatric Environmental Section Protocols

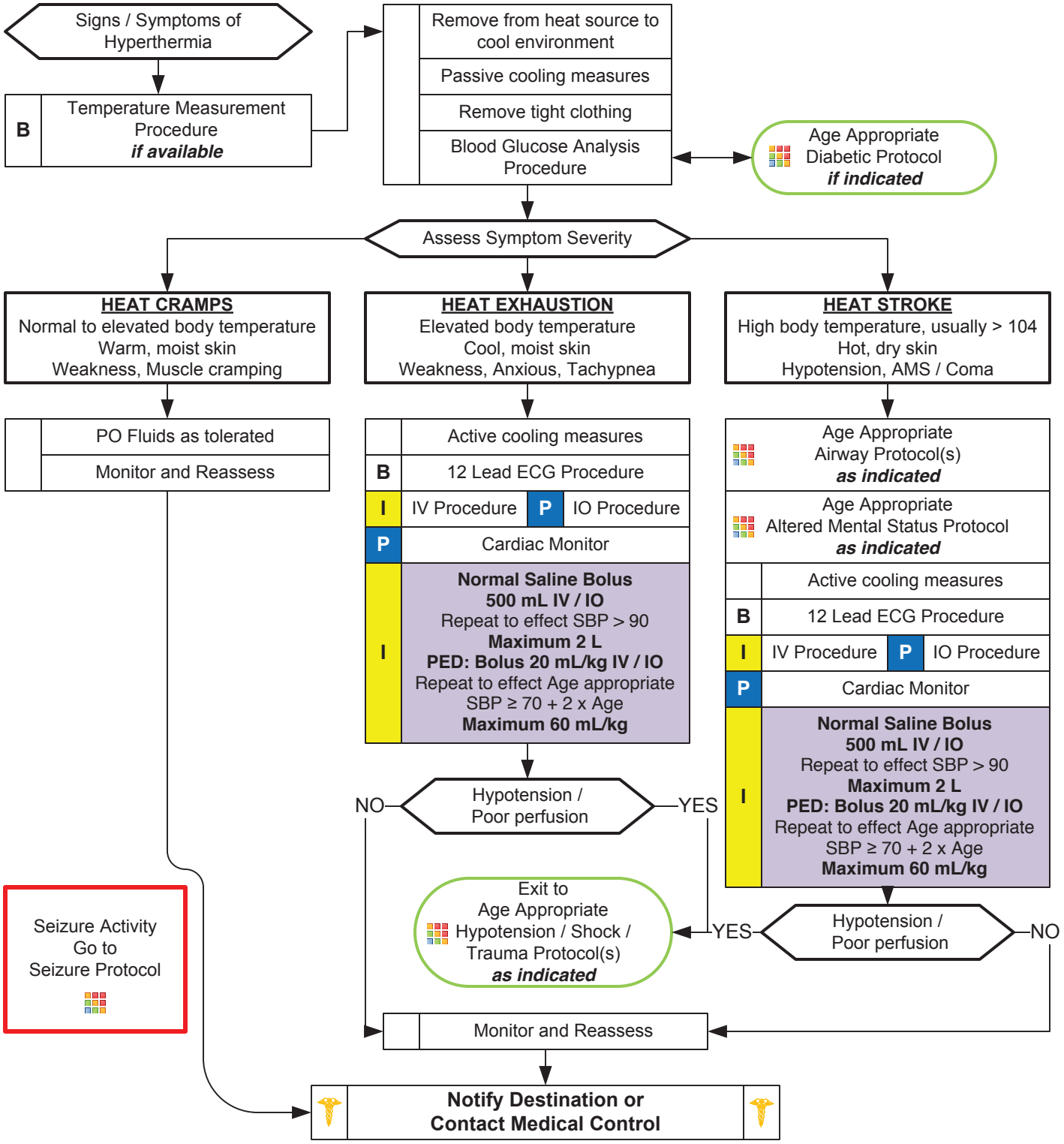
## Pearls
- **Recommended Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **Allow appropriately trained and certified rescuers to remove victims from areas of danger.**
- **With cold water no time limit -- resuscitate all. These patients have an increased chance of survival.**
- Have a high index of suspicion for possible spinal injuries
- Hypothermia is often associated with drowning and submersion injuries.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- With pressure injuries (decompression / barotrauma), consider transport to or availability of a hyperbaric chamber.

# Hyperthermia

## History
- Age, very young and old
- Exposure to increased temperatures and / or humidity
- Past medical history / Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

## Signs and Symptoms
- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

## Differential
- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism (Storm)
- Delirium tremens (DT's)
- Heat cramps, exhaustion, stroke
- CNS lesions or tumors




Adult / Pediatric Environmental Section Protocols

# Hyperthermia



**Pearls**

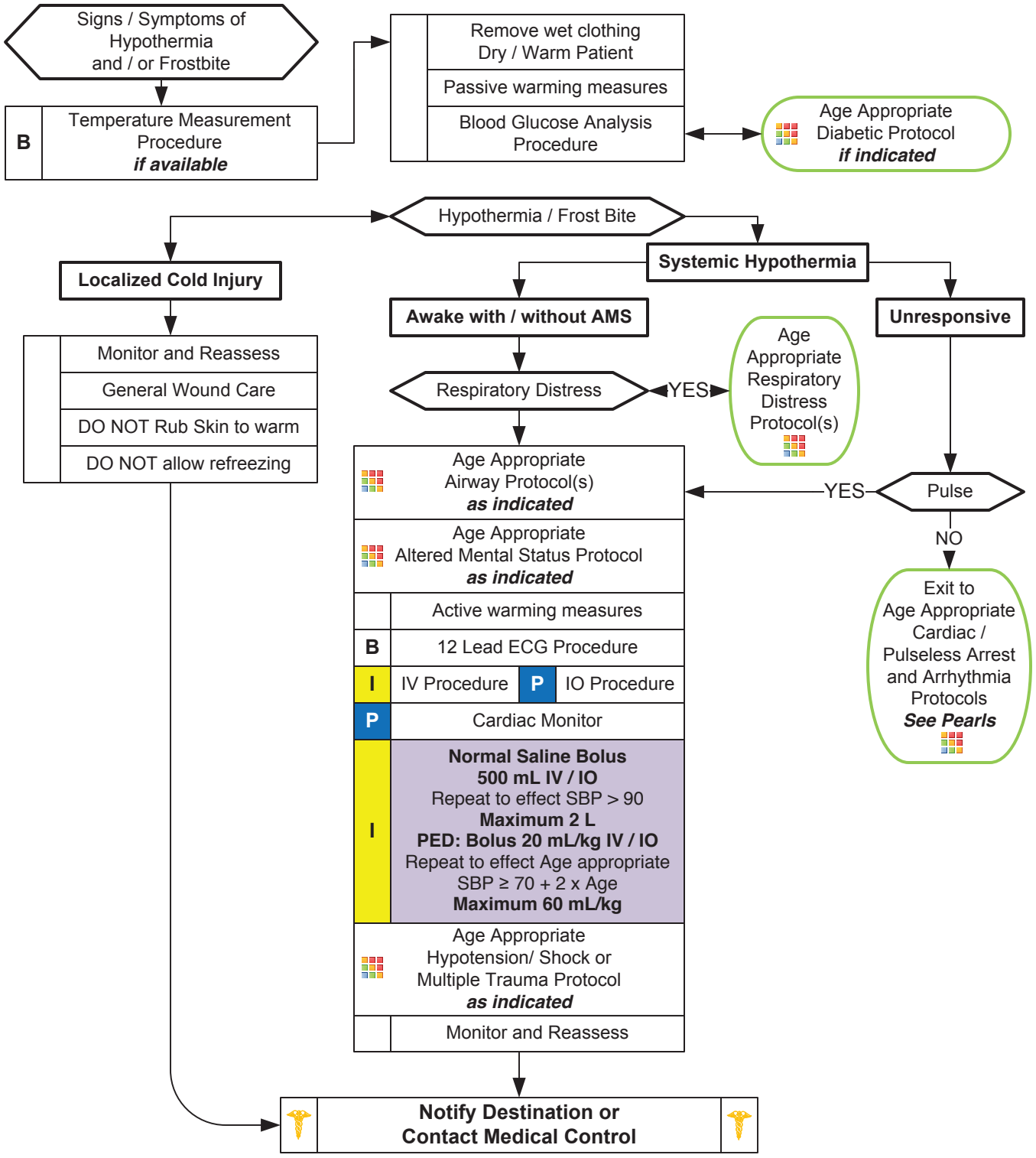
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- Extremes of age are more prone to heat emergencies (i.e. young and old). Obtain and document patient temperature if able.
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Sweating generally disappears as body temperature rises above 104° F (40° C).
- Intense shivering may occur as patient is cooled.
- **Heat Cramps** consists of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion** consists of dehydration, salt depletion, dizzyness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of dehydration, tachycardia, hypotension, temperature >104° F (40° C), and an altered mental status.

# Hypothermia / Frostbite

## History
- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections / Sepsis
- Length of exposure / Wetness / Wind chill

## Signs and Symptoms
- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

## Differential
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord injury




Adult / Pediatric Environmental Section Protocols

# Hypothermia / Frostbite





## Pearls

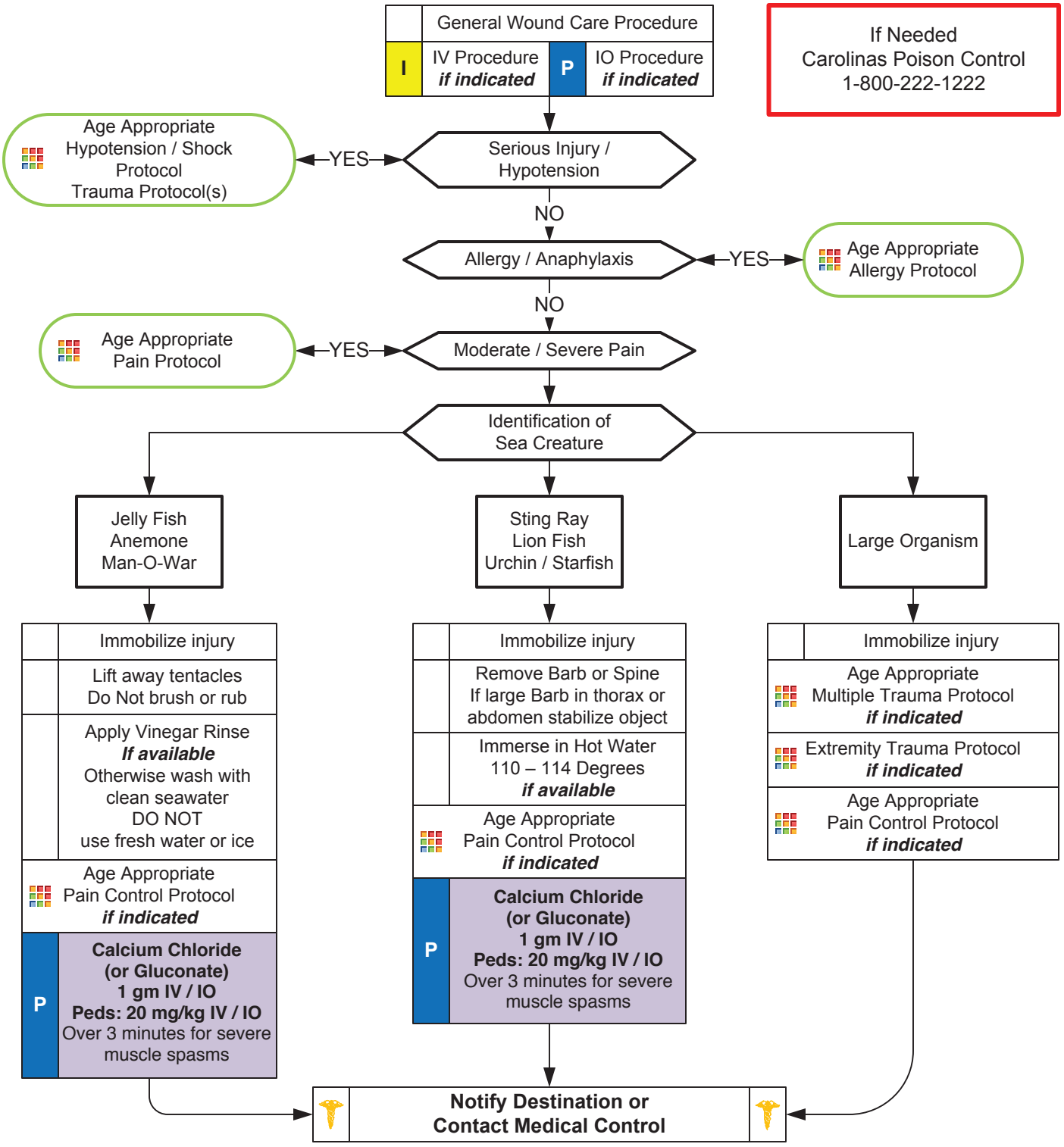
- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature ≥ 93.2 degrees F, 32 degrees C.)**
- **Hypothermia categories:**
  - Mild 90 – 95 degrees F ( 32 – 35 degrees C)
  - Moderate 82 – 90 degrees F ( 28 – 32 degrees C)
  - Severe < 82 degrees F ( < 28 degrees C)
- **Mechanisms of hypothermia:**
  - Radiation: Heat loss to surrounding objects via infrared energy ( 60 % of most heat loss.)
  - Convection: Direct transfer of heat to the surrounding air.
  - Conduction: Direct transfer of heat to direct contact with cooler objects (important in submersion.)
  - Evaporation: Vaporization of water from sweat or other body water losses.
- Contributing factors of hypothermia: Extremes of age, malnutrition, alcohol or other drug use.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- **CPR:**
  - **Severe hypothermia may cause cardiac instability and rough handling of the patient theoretically can cause ventricular fibrillation. This has not been demonstrated or confirmed by current evidence.**
  - **Intubation and CPR techniques should not be with-held due to this concern.**
  - **Intubation can cause ventricular fibrillation so it should be done gently by most experienced person.**
  - **Below 86 degrees F (30 degrees C) antiarrythmics may not work and if given should be given at reduced intervals. Contact medical control for direction. Epinephrine / Vasopressin can be administered. Below 86 degress F (30 degrees) pacing should not be done**
  - **Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.**
  - **If the patient is below 86 degrees F (30 degree C) then defibrillate 1 time if defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact medical control for direction.**
  - **Hypothermia may produce severe bradycardia so take at least 45 second to palpate a pulse.**
- Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.

# Marine Envenomations / Injury

## History
- Type of bite / sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

## Signs and Symptoms
- Intense localized pain
- Increased oral secretions
- Nausea / vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

## Differential
- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting




Adult / Pediatric Environmental Section Protocols

# Marine Envenomations / Injury





**Pearls**

- Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting / injury.
- Patients can suffer cardiovascular collapse from both the venom and / or anaphylaxis even in seemingly minor envenomations.
- Sea creature stings and bites impart moderate to severe pain.
- Arrest the envenomation by inactivation of the venom as appropriate.
- Ensure good wound care, immobilization and pain control.

# WMD-Nerve Agent Protocol

## History
- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard

## Signs and Symptoms
- **S**alivation
- **L**acrimation
- **U**rination; increased, loss of control
- **D**efecation / Diarrhea
- **G**I Upset; Abdominal pain / cramping
- **E**mesis
- **M**uscle Twitching
- Seizure Activity
- Respiratory Arrest

## Differential
- Nerve agent exposure (e.g., VX, Sarin, Soman, etc.)
- Organophosphate exposure (pesticide)
- Vesicant exposure (e.g., Mustard Gas, etc.)
- Respiratory Irritant Exposure (e.g., Hydrogen Sulfide, Ammonia, Chlorine, etc.)

Scene Safe Appropriate PPE

NO → Call for help / additional resources. Stage until scene safe

YES → **Obtain history of exposure. Observe for specific toxidromes. Initiate triage and/or decontamination as indicated.**

Symptom Severity

**Asymptomatic**

Monitor and Reassess Every 15 minutes for symptoms. Initiate Treatment per Appropriate Arm

Seizure Activity Go to Seizure Protocol

**Minor Symptoms:**
**Respiratory Distress + SLUDGEM**

| I | IV Procedure | P | IO Procedure |
|---|---|---|---|
| | **Nerve Agent Kit IM 2 Doses Rapidly** if available | | |
| P | **Atropine 2 mg IV / IM / IO** **Peds: 0.02 – 0.05 mg/kg IV / IM / IO** Repeat every 5 minutes until symptoms resolve | | |
| | **Pralidoxime (2 PAM) 600 mg IV / IM / IO** **Peds: 15 – 25 mg/kg IV / IM / IO** Over 30 minutes | | |

**Major Symptoms:**
**Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest**

| I | IV Procedure | P | IO Procedure |
|---|---|---|---|
| | **Nerve Agent Kit IM 3 Doses Rapidly** if available | | |
| P | **Atropine 6 mg IV / IM / IO** **Peds: 0.02 – 0.05 mg/kg IV / IM / IO** Repeat every 5 minutes until symptoms resolve | | |
| | **Pralidoxime (2 PAM) 1800 mg IV / IM / IO** **Peds: 15 – 25 mg/kg IV / IM / IO** Over 30 minutes | | |

**Notify Destination or Contact Medical Control**

Adult / Pediatric Environmental Section Protocols

## Pearls
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Gastrointestinal, Neuro**
- **Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
- **In the face of a bona fide attack, begin with 1 Nerve Agent Kit for patients less than 7 years of age, 2 Nerve Agent Kits from 8 to 14 years of age, and 3 Nerve Agent Kits for patients 15 years of age and over.**
- **If Triage/MCI issues exhaust supply of Nerve Agent Kits, use pediatric atropines (if available). Use the 0.5 mg dose if patient is less than 40 pounds (18 kg), 1 mg dose if patient weighs between 40 to 90 pounds (18 to 40 kg), and 2 mg dose for patients greater than 90 pounds (>40 kg).**
- **Each Nerve Agent Kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine.**
- **Seizure Activity: Any benzodiazepine by any route is acceptable.**
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they not from exposure to another agent (e.g., narcotics, vesicants, etc.)
- The main symptom that the atropine addresses is excessive secretions so atropine should be given until salivation improves.
- EMS personnel, public safety officers and Medical Responders / EMT-B may carry, self-administer or administer to a patient atropine / pralidoxime by protocol. Agency medical director may require Contact of Medical Control prior to administration.

# Blast Injury / Incident

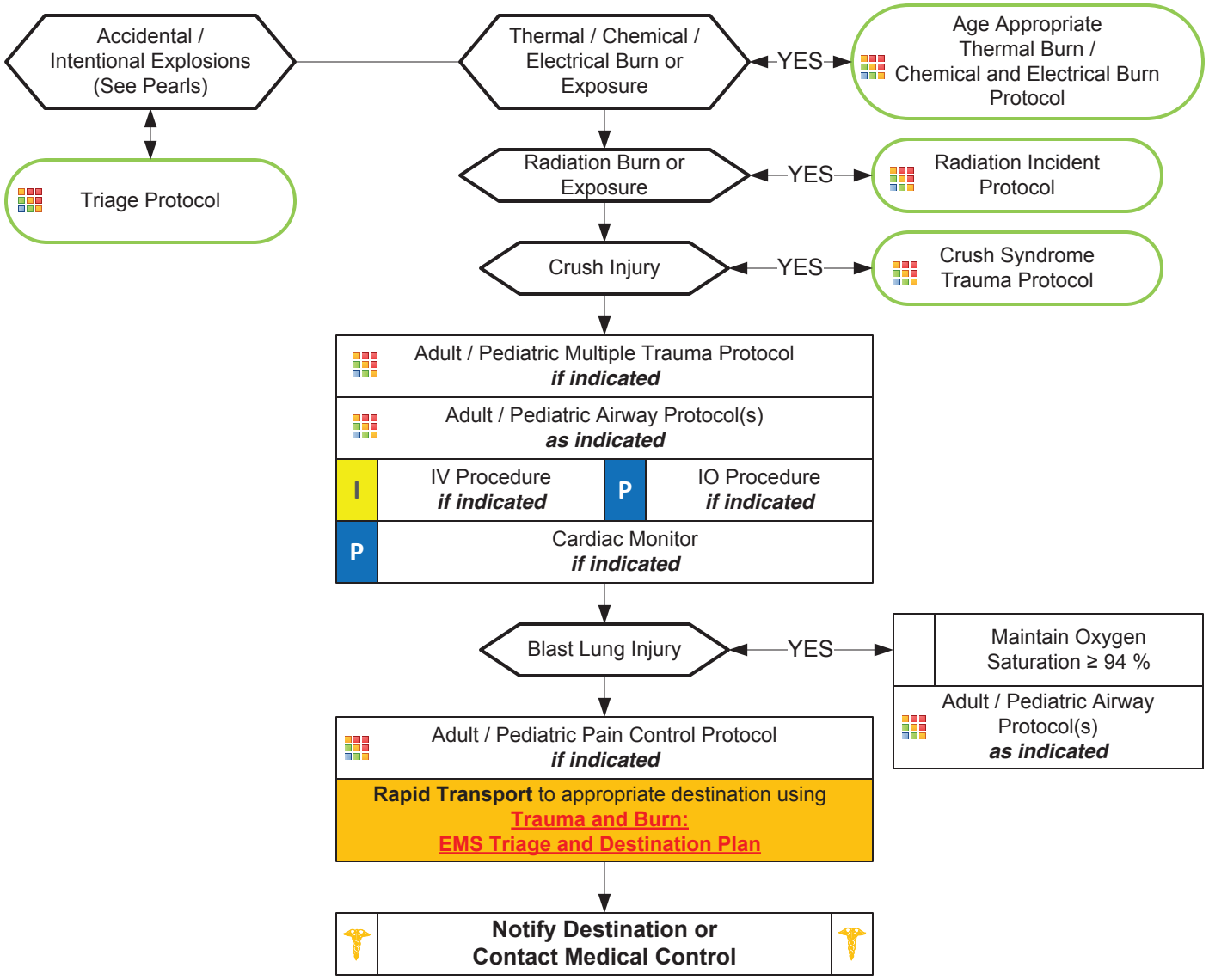
## History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

## Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

## Differential
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

**Nature of Device:** Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.
**Method of Delivery:** Incendiary / Explosive
**Nature of Environment:** Open / Closed.
**Distance from Device:** Intervening protective barrier. Other environmental hazards,
**Evaluate for:** Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.

**Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute**



# Blast Injury / Incident





## Pearls

- **Types of Blast Injury:**
  - Primary Blast Injury: From pressure wave.
  - Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel.
  - Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.
  - Most Common Cause of Death: Secondary Blast Injuries.
- **Triage of Blast Injury patients:**
  - Blast Injury Patients with Burn Injuries Must be Triaged using the Thermal / Chemical / Electrical Burn Destination Guidelines for Critical / Serious / Minor Trauma and Burns
- **Care of Blast Injury Patients:**
  - Blast Injury Patients with Burn Injuries Must be cared for using the Thermal / Chemical / Electrical Burn Protocols.
  - Use Lactated Ringers (if available) for all Critical or Serious Burns.
- **Blast Lung Injury:**
  - Blast Lung Injury is characterized by respiratory difficulty and hypoxia. Can occur (rarely) in patients without external thoracic trauma. More likely in enclosed space or in close proximity to explosion.
  - Symptoms: Dyspnea, hemoptysis cough, chest pain, wheezing and hemodynamic instability.
  - Signs: Apnea, tachypnea, hypopnea, hypoxia, cyanosis and diminished breath sounds.
  - Air embolism should be considered and patient transported prone and in slight left-lateral decubitus position.
  - Blast Lung Injury patients may require early intubation but positive pressure ventilation may exacerbate the injury, avoid hyperventilation.
  - Air transport may worsen lung injury as well and close observation is mandated. Tension pneumothorax may occur requiring chest decompression. Be judicious with fluids as volume overload may worsen lung injury.
- **Accident Explosions:**
  - Attempt to determine source of the blast to include any potential threat for particalization of hazardous materials.·
  - Evaluate scene safety to include the source of the blast that may continue to spill explosive liquids or gases.
  - Consider structural collapse / Environmental hazards / Fire.·
  - Conditions that led to the initial explosion may be returning and lead to a second explosion.
  - Patients who can, typically will attempt to move as far away from the explosive source as they safely can.
- **Intentional Explosions:**
  - Attempt to determine source of the blast to include any potential threat for particalization of hazardous materials.
  - Greatest concern is potential threat for a secondary device.
  - Evaluate surroundings for suspicious items; unattended back packs or packages, or unattended vehicles.
  - **If patient is unconscious or there is(are) fatality(fatalities) and you are evaluating patient(s) for signs of life: Before moving note if there are wires coming from the patient(s), or it appears the patient(s) is(are) lying on a package/pack, or bulky item, do not move the patient(s), quickly back away and immediately notify a law enforcement officer.** If no indications the patient is connected to a triggering mechanism for a secondary device, expeditiously remove the patient(s) from the scene and begin transport to the hospital.
  - Protect the airway and cervical spine, however, beyond the primary survey, care and a more detailed assessment should be deferred until the patient is in the ambulance.
  - If there are signs the patient was carrying the source of the blast, notify law enforcement immediately and most likely, a law enforcement officer will accompany your patient to the hospital.
  - Consider the threat of structural collapse, contaminated particles and / or fire hazards.

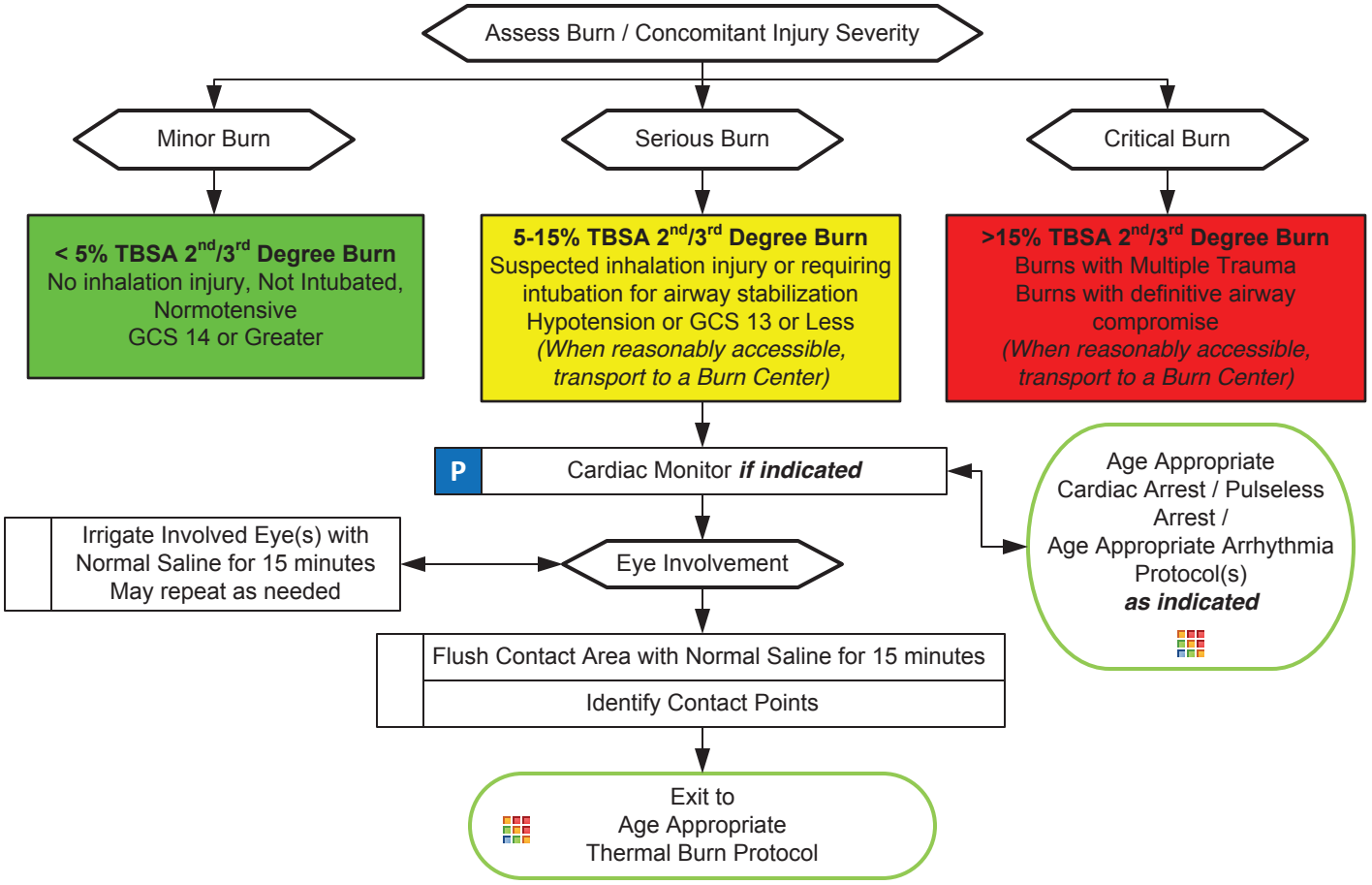
# Chemical and Electrical Burn

## History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

## Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

## Differential
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

**Assure Chemical Source is NOT Hazardous to Responders.**
**Assure Electrical Source is NO longer in contact with patient before touching patient.**




Adult / Pediatric Trauma and Burn Section Protocols

## Pearls
- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to the Start / JumpStart Triage System.**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source, does not always reflect more extensive internal damage not seen.**
- **Chemical Burns:**
  Refer to Decontamination Procedure.
  Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Electrical Burns:**
  DO NOT contact patient until you are certain the source of the electrical shock is disconnected.
  Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded. Sites will generally be full thickness. **Do not refer to as entry and exit sites or wounds.**
  Cardiac Monitor: Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation and / or heart blocks.
  Attempt to identify then nature of the electrical source (AC / DC,) the amount of voltage and the amperage the patient may have been exposed to during the electrical shock.

# Crush Syndrome Trauma

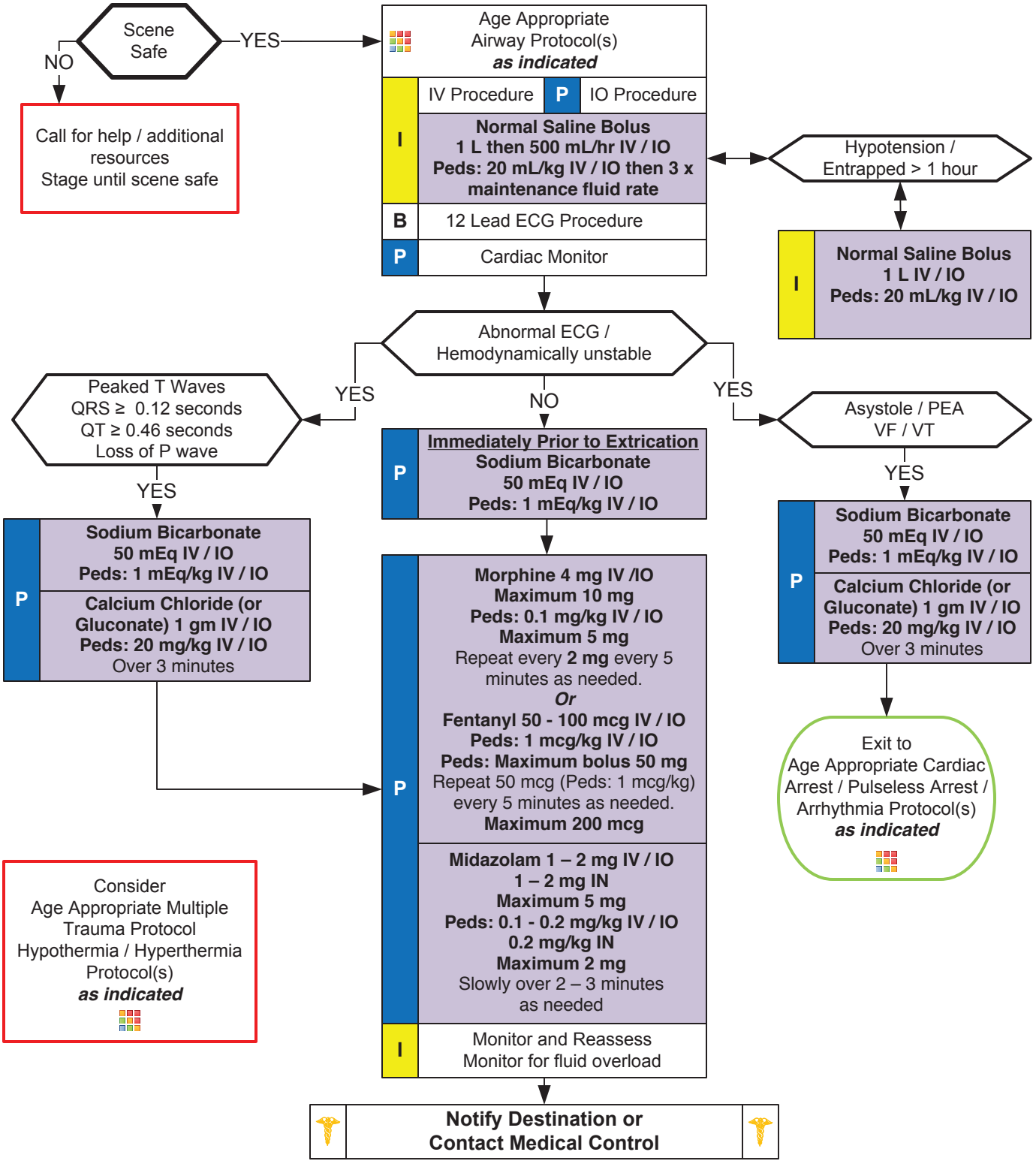
NCCEP

NORTH CAROLINA EMS OFFICE of EMS

## History
- Entrapped and crushed under heavy load > 30 minutes
- Extremity / body crushed
- Building collapse, trench collapse, industrial accident, pinned under heavy equipment

## Signs and Symptoms
- Hypotension
- Hypothermia
- Abnormal ECG findings
- Pain
- Anxiety

## Differential
- Entrapment without crush syndrome
- Entrapment without significant crush
- Altered mental status




Adult / Pediatric Trauma and Burn Section Protocols

# Crush Syndrome Trauma





**Pearls**

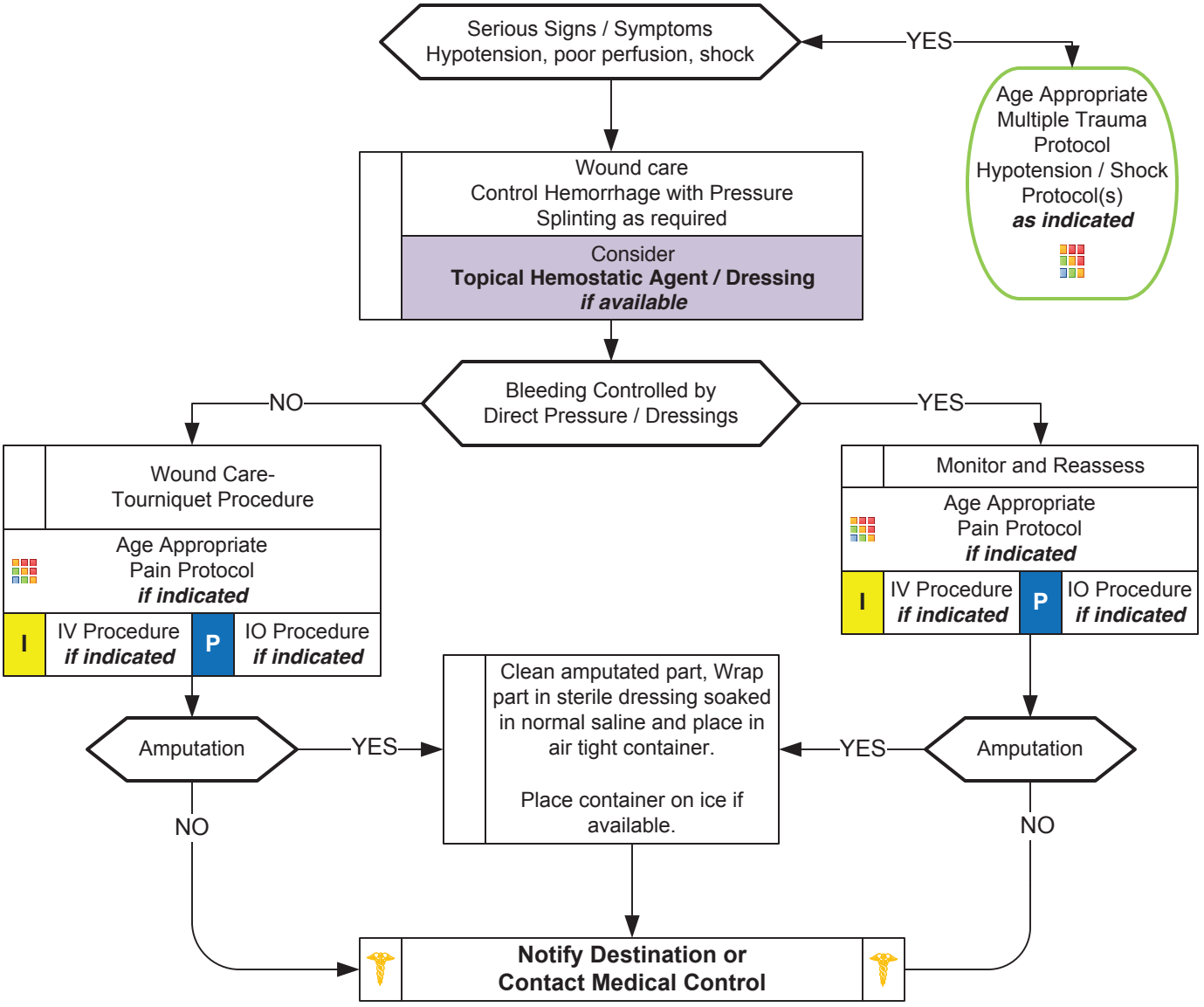
- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.**
- Avoid Ringers Lactate IV Solution due to potassium and potential worsening hyperkalemia
- Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also be a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the VF/Pulseless VT Protocol.
- Patients may become hypothermic even in warm environments.
- Pediatric IV Fluid maintenance rate: 4 mL per first 10 kg of weight + 2 mL per second 10 kg of weight + 1 mL for every additional kg in weight.

# Extremity Trauma

## History
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open vs. closed wound / fracture
- Wound contamination
- Medical history
- Medications

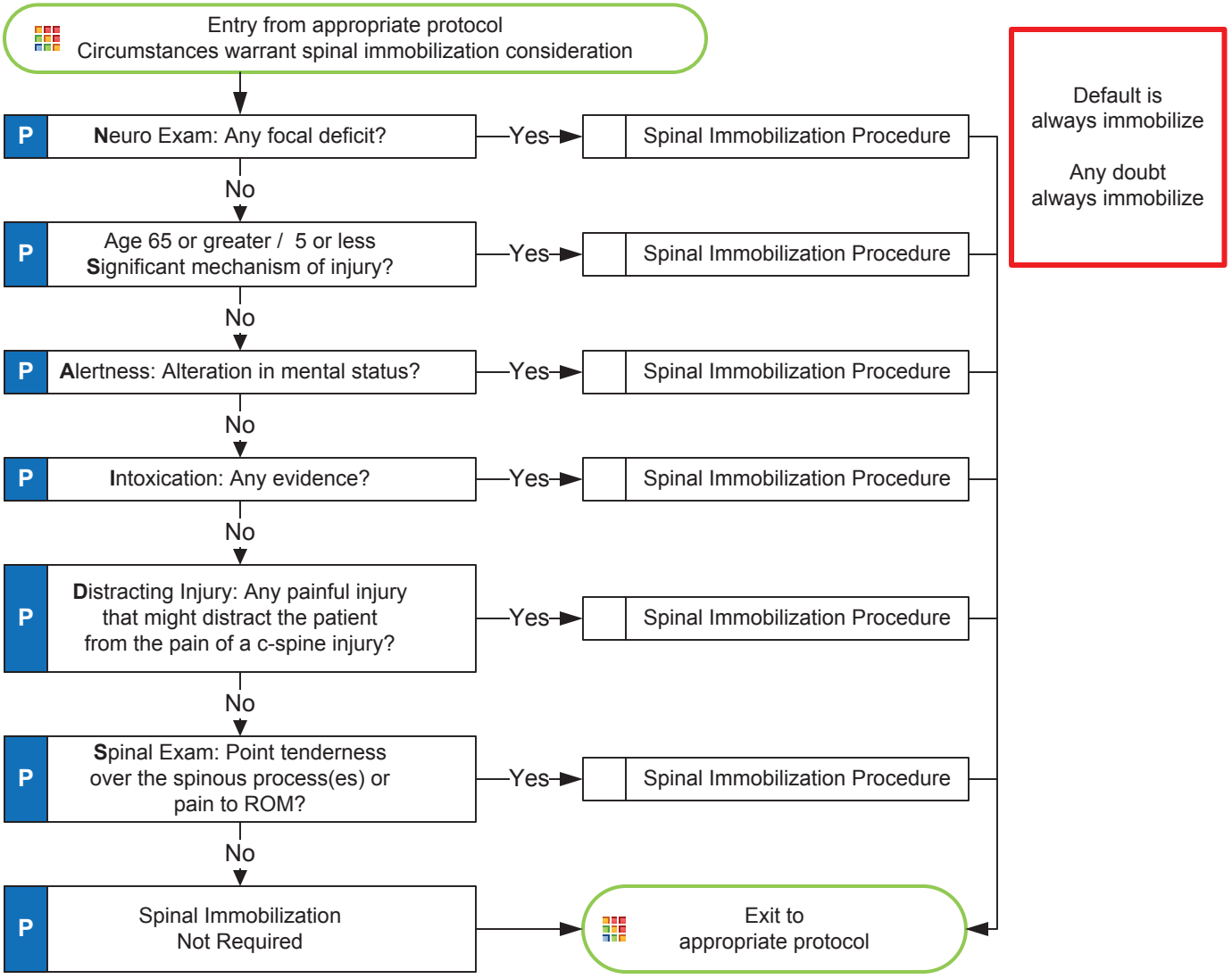
## Signs and Symptoms
- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

## Differential
- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation




## Pearls
- **Recommended Exam: Mental Status, Extremity, Neuro**
- Peripheral neurovascular status is important
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- Multiple casualty incident: Tourniquet Procedure may be considered first instead of direct pressure.

# Selective Spinal Immobilization (Optional)






## Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Consider immobilization in any patient with arthritis, cancer, dialysis or other underlying spinal or bone disease.**
- **The decision to NOT implement spinal immobilization in a patient is the responsibility of the paramedic solely.**
- **In very old and very young, a normal exam may not be sufficient to rule out spinal injury.**
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for spinal immobilization in the absence of symptoms.
- Range of motion should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted. The patient should touch their chin to their chest, extend their neck (look up), and turn their head from side to side (shoulder to shoulder) without spinal process pain.
- **The acronym "NSAIDS" should be used to remember the steps in this protocol.**
  "**N**" = Neurologic exam. Look for focal deficits such as tingling, reduced strength, on numbness in an extremity.
  "**S**" = Significant mechanism or extremes of age.
  "**A**" = Alertness. Is patient oriented to person, place, time, and situation? Any change to alertness with this incident?
  "**I**" = Intoxication. Is there any indication that the person is intoxicated, impaired decision-making ability (alcohol, drugs?)
  "**D**" = Distracting injury. Is there any other injury producing significant pain in this patient? Any injury which the patient seems to focus on and rate 6 or greater on the pain scale is likely distracting.
  "**S**" = Spinal exam. Look for point tenderness in any spinal process or spinal process tenderness with range of motion. Each of 7 cervical spinal processes must be palpated during the exam.
- Apply appropriate padding to fill voids especially in the elderly, very young and / or obese patients.

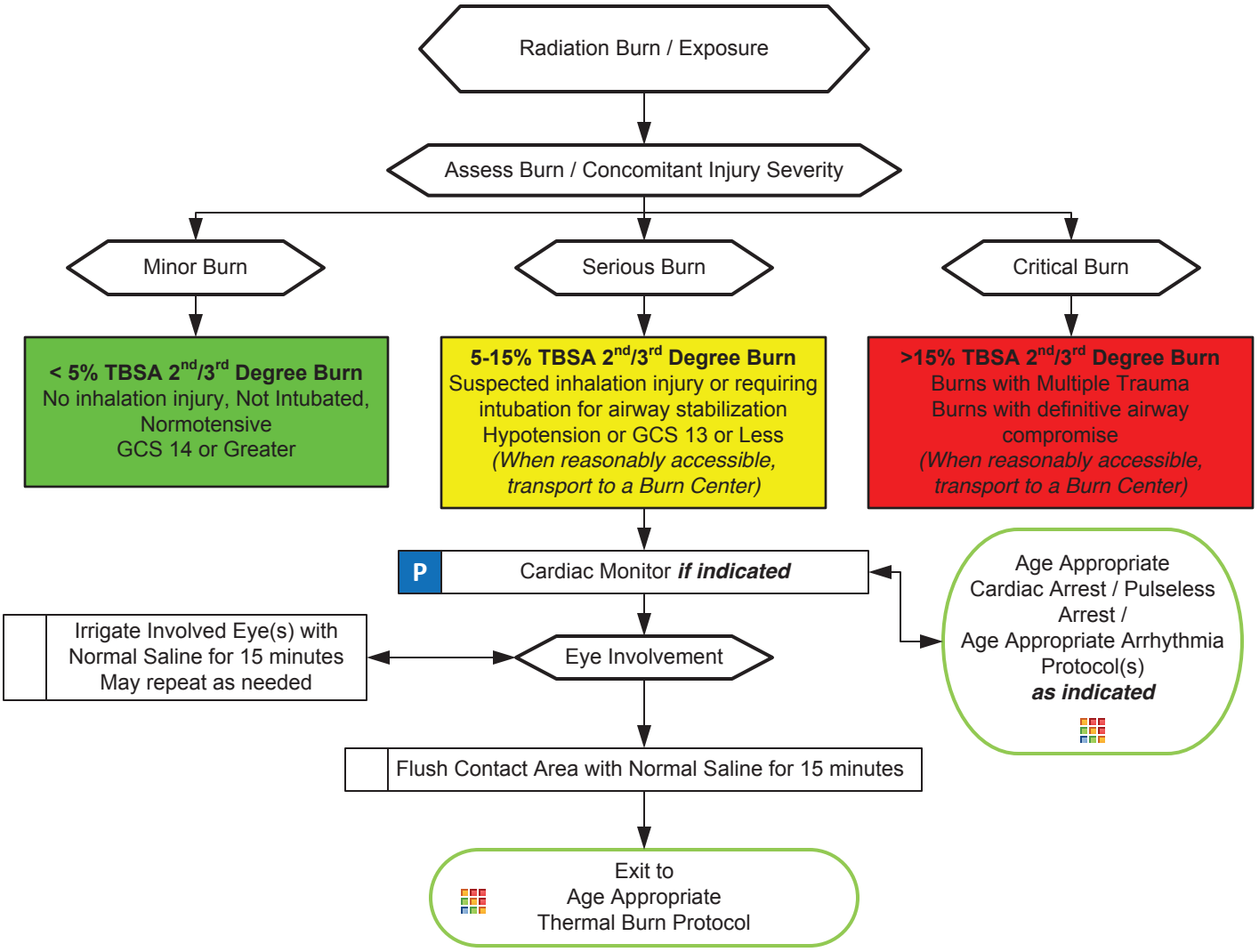
# Radiation Incident

## History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

## Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

## Differential
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

**Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute**

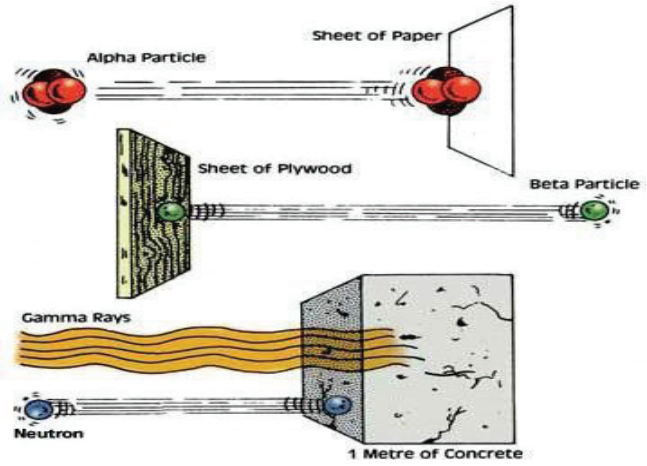



***Collateral Injury:*** Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.·

***Qualify:*** Determine exposure type; external irradiation, external contamination with radioactive material, internal contamination with radioactive material.·

***Quantify:*** Determine exposure (generally measured in Grays/Gy). *Information may be available from those on site who have monitoring equipment, do not delay transport to acquire this information.*

# Radiation Incident




**Time Phases of Radiation Injury**
**(Exposure Dose vs Clinical Outcome)**

| Exposure Dose (Gy) | Prodrome Severity | Manifest Illness - Symptom Severity | | | Prognosis |
|---|---|---|---|---|---|
| | | Hematologic | Gastrointestinal | Neurologic | |
| 0.5 to 1.0 | + | + | 0 | 0 | Survival almost certain |
| 1.0 to 2.0 | +/++ | + | 0 | 0 | Survival >90 percent |
| 2.0 to 3.5 | ++ | ++ | 0 | 0 | Probable survival |
| 3.5 to 5.5 | +++ | +++ | + | 0 | Death in 50% at 3.5 to 6 wks |
| 5.5 to 7.5 | +++ | +++ | ++ | 0 | Death probable in 2-3 wks |
| 7.5 to 10 | +++ | +++ | +++ | 0* | Death probable in 1-2.5 wks |
| 10 to 20 | +++ | +++ | +++ | +++ | Death certain in 5-12 days |
| > 20 | +++ | +++ | +++ | +++** | Death certain in 2-5 days |

**Abbreviations:** Gy: dose in Grey;
0: no effects; +: mild; ++: moderate; +++: severe or marked

* Hypotension
** Also cardiovascular collapse, fever, shock

Modified from : Waselenko, JK, MacVittie, TJ, Blakely, WF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039.

## Pearls

- Dealing with a patient with a radiation exposure can be a frightening experience. Do not ignore the ABC's, a dead but decontaminated patient is not a good outcome. Refer to the Decontamination Procedure for more information.
- Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Three methods of exposure:**
  - External irradiation
  - External contamination
  - Internal contamination
- **Two classes of radiation:**
  - Ionizing radiation (greater energy) is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays.
  - Non-ionizing (lower energy) examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem).
- Patients experiencing radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination.
- Typical ionizing radiation sources in the civilian setting include soil density probes used with roadway builders and medical uses such as x-ray sources as well as radiation therapy. Sources used in the production of nuclear energy and spent fuel are rarely exposure threats as is military sources used in weaponry. Nevertheless, these sources are generally highly radioactive and in the unlikely event they are the source, consequences could be significant and the patient's outcome could be grave.
- **The three primary methods of protection from radiation sources:**
  - Limiting time of exposure
  - Distance from
  - Shielding from the source
- Dirty bombs ingredients generally include previously used radioactive material and combined with a conventional explosive device to spread and distribute the contaminated material.
- Refer to Decontamination Procedure / WMD / Nerve Agent Protocol for dirty contamination events.
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes: Nausea/ Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.
- This event may require an activation of the National Radiation Injury Treatment Network, RITN. UNC Hospitals, Wake Forest-Baptist and Duke are the NC hospitals, with burns managed at UNC and Wake Forest.

# 2012 EMS Policies

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# Air Transport

**Policy:**

Air transport should be utilized whenever patient care can be improved by decreasing transport time or by giving advanced care not available from ground EMS services, but available from air medical transport services (i.e. blood).

**Purpose:**

The purpose of this policy is to:

- Improve patient care in the prehospital setting.
- Allow for expedient transport in serious, mass casualty settings.
- Provide life-saving treatment such as blood transfusion.
- Provide more timely access to interventional care in acute Stroke and ST-elevation myocardial infarction (STEMI) patients

**Procedure:**

Patient transportation via ground ambulance will not be delayed to wait for helicopter transportation. If the patient is packaged and ready for transport and the helicopter is not on the ground, or within a reasonable distance, the transportation will be initiated by ground ambulance.

Air transport should be considered if any of the following criteria apply**:**

- High priority patient with > 20 minute transport time
- Entrapped patients with > 10 minute estimated extrication time
- Multiple casualty incident with red/yellow tag patients
- Multi-trauma or medical patient requiring life-saving treatment not available in prehospital environment (i.e., blood transfusion, invasive procedure, operative intervention)
- Time dependent medical conditions such as acute ST-elevation myocardial infarctions (STEMI) or acute Stroke that could benefit from the resources at a specialty center as per the EMS System's Stroke and STEMI Plans.

If a potential need for air transport is anticipated, but not yet confirmed, an air medical transport service can be placed on standby.

If the scene conditions or patient situation improves after activation of the air medical transport service and air transport is determined not to be necessary, paramedic or administrative personnel may cancel the request for air transport.

Minimal Information which should be provided to the air medical transport service include:

- Number of patients
- Age of patients
- Sex of patients
- Mechanism of injury or complaint (MVC, fall, etc)

# Child Abuse Recognition and Reporting

**Policy:**

Child abuse is the physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

**Purpose:**

Assessment of a child abuse case based upon the following principles:

- **Protect** the life of the child from harm, as well as that of the EMS team from liability.
- **Suspect** that the child may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the child and family.
- **Collect** as much evidence as possible, especially information.

**Procedure:**

1. With all children, assess for and document psychological characteristics of abuse, including excessively passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders

2. With all children, assess for and document physical signs of abuse, including especially any injuries that are inconsistent with the reported mechanism of injury.

3. With all children, assess for and document signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.

4. Immediately report any suspicious findings to both the receiving hospital (if transported) and to agency responsible for Social Services in the county. After office hours, the child protective services worker on call can be contacted by the EMS System's 911 communications center. While law enforcement may also be notified, North Carolina law requires the EMS provider to report the suspicion of abuse to DSS. EMS should not accuse or challenge the suspected abuser. This is a legal requirement to report, not an accusation. In the event of a child fatality, law enforcement must also be notified.

# Child with Special Health Care Needs

**Policy:**

Medical technology, changes in the healthcare industry, and increased home health capabilities have created a special population of patients that interface with the EMS system. It is important for EMS to understand and provide quality care to children with special health care needs.

**Purpose:**

The purpose of this policy is to:

- Provide quality patient care and EMS services to children with special health care needs.
- Understand the need to communicate with the parents and caregivers regarding healthcare needs and devices that EMS may not have experience with.
- Promote and encourage parents and caregivers to complete forms provided by physicians and children hospitals/clinics that identifies the health care problems, needs, and issues the child with a special healthcare need.

**Procedure:**

1. Parents and caregivers who call “911” to report and emergency involving a child with special health care needs may state that the situation involves a special needs child.

2. Responding EMS personnel should ask the parent or caregiver of a special needs child for a copy of the completed form (includes medical history and special care needs of the child).

3. EMS personnel should contact medical control for assistance with specific conditions or devices or for advice regarding appropriate treatment and/or transport of the child in the specific situation.

4. Transportation of the child, if necessary, will be made to the hospital appropriate for the specific condition of the child. In some cases this may involve bypassing the closest facility for a more distant yet more medically appropriate destination.

# Criteria for Death / Withholding Resuscitation

**Policy:**

CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid North Carolina ***MOST and/or Do Not Resuscitate*** form (see separate policy) is present.

**Purpose:**

The purpose of this policy is to:

- Honor those who have obviously expired prior to EMS arrival.

**Procedure:**

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:

    - Body decomposition
    - Rigor mortis
    - Dependent lividity
    - Blunt force trauma
    - Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)
    - Extended downtime with Asystole on the ECG

2. If a bystander or first responder has initiated CPR or automated defibrillation prior to an EMS paramedic's arrival and any of the above criteria (signs of obvious death) are present, the paramedic may discontinue CPR and ALS therapy. All other EMS personnel levels must communicate with medical control prior to discontinuation of the resuscitative efforts.

3. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
    a) Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy** (see separate policy)
    b) Patient care responsibilities are transferred to the destination hospital staff.

# Deceased Subjects

**Policy:**

EMS will handle the disposition of deceased subjects in a uniform, professional, and timely manner.

**Purpose:**

The purpose of this policy is to:

- Organize and provide for a timely disposition of any deceased subject
- Maintain respect for the deceased and family
- Allow EMS to return to service in a timely manner.

**Procedure:**

1. Do not remove lines or tubes from unsuccessful cardiac arrests/codes unless directed below.

2. Notify the law enforcement agency with jurisdiction if applicable.

3. If subject was found deceased by EMS, the scene is turned over to law enforcement.

4. If EMS has attempted to resuscitate the patient and then terminated the resuscitative efforts, the EMS personnel should contact the family physician (medical cases) or medical examiner (traumatic cases or family physician unavailable) to provide information about the resuscitative efforts.

5. Transport arrangements should be made in concert with law enforcement and the family's wishes.

6. If the deceased subject's destination is other than the county morgue, any line(s) or tube(s) placed by EMS should be removed prior to transport.

7. Document the situation, name of Physician or Medical Examiner contacted, the agency providing transport of the deceased subject, and the destination on the patient care report form (PCR).

# Discontinuation of Prehospital Resuscitation

**Policy:**

Unsuccessful cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this procedure is followed.

**Purpose:**

The purpose of this policy is to:

- Allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate ALS therapy.

**Procedure:**

1. Discontinuation of CPR and ALS intervention may be implemented **prior to contact with Medical Control if ALL** of the following criteria have been met:

   - Patient must be 18 years of age or older
   - Adequate CPR has been administered
   - Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy
   - IV or IO access has been achieved
   - No evidence or suspicion of any of the following:
     **-Drug/toxin overdose** **-Active internal bleeding**
     **-Hypothermia** **-Preceding trauma**
   - Rhythm appropriate medications and defibrillation have been administered according to local EMS Protocols for a total of 3 cycles of drug therapy without return of spontaneous circulation (palpable pulse)
   - All EMS paramedic personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate

2. If all of the above criteria are not met and discontinuation of prehospital resuscitation is desired, **contact Medical Control**.

3. The **Deceased Subjects Policy** should be followed.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report (PCR).

# Disposition (Patient Instructions)

**Policy:**

All patient encounters responded to by EMS will result in the accurate and timely completion of:

- The Patient Care Report (PCR) for all patients transported by EMS
- The Patient Disposition Form for all patients not transported by EMS

**Purpose:**

To provide for the documentation of:

- The evaluation and care of the patient
- The patient's refusal of the evaluation, treatment, and/or transportation
- The patient's disposition instructions
- The patient's EMS encounter to protect the local EMS system and its personnel from undue risk and liability.

**Procedure:**

1. All patient encounters, which result in some component of an evaluation, must have a Patient Care Report completed.

2. All patients who refuse any component of the evaluation or treatment, based on the complaint, must have a Disposition Form completed.

3. All patients who are NOT transported by EMS must have a Disposition (patient instruction) Form completed including the Patient Instruction Section.

4. A copy of the Patient Disposition Form should be maintained with the official Patient Care Report (PCR)

# North Carolina Do Not Resuscitate and MOST Form

**Policy:**

Any patient presenting to any component of the EMS system with a completed **North Carolina *Do Not Resuscitate* (DNR)** form (yellow form) and/or **MOST (Medical Orders for Scope of Treatment)** form (bright pink form) shall have the form honored. Treatment will be limited as documented on the DNR or MOST form.

**Purpose:**

- To honor the terminal wishes of the patient
- To prevent the initiation of unwanted resuscitation

**Procedure:**

1. When confronted with a patient or situation involving the NC DNR and/or MOST form(s), the following form content must be verified before honoring the form(s) request.

   - The form(s) must be an original North Carolina DNR form (yellow form - not a copy) and/or North Carolina MOST form (bright pink – not a copy)
   - The effective date and expiration date must be completed and current
   - The DNR and/or MOST Form must be signed by a physician, physician's assistant, or nurse practitioner.

2. A valid DNR or MOST form may be overridden by the request of:

   - The patient
   - The guardian of the patient
   - An on-scene physician

   If the patient or anyone associated with the patient requests that a NC DNR and/or MOST form not be honored, EMS personnel should contact **Medical Control** to obtain assistance and direction

3. A living will or other legal document that identifies the patient's desire to withhold CPR or other medical care may be honored with the approval of **Medical Control**. This should be done when possible in consultation with the patient's family and personal physician.

# EMS Documentation and Data Quality

**Policy:**

The complete EMS documentation associated with an EMS events service delivery and patient care shall be electronically recorded into a Patient Care Report (PCR) within 24 hours of the completion of the EMS event with an average EMS Data Score of 5 or less.

**Definition:**

The EMS documentation of a Patient Care Report (PCR) is based on the appropriate and complete documentation of the EMS data elements as required and defined within the North Carolina College of Emergency Physician's EMS Standards (www.NCCEP.org). Since each EMS event and/or patient scenario is unique, only the data elements relevant to that EMS event and/or patient scenario should be completed.

The EMS Data Score is calculated on each EMS PCR as it is electronically processed into the North Carolina PreHospital Medical Information System (PreMIS). Data Quality Scores are provided within PreMIS and EMS Toolkit Reports. The best possible score is a 0 (zero) and with each data quality error a point is added to the data quality score.

A complete Patient Care Report (PCR) must contain the following information (as it relates to each EMS event and/or patient):

- Service delivery and Crew information regarding the EMS Agency's response
- Dispatch information regarding the dispatch complaint, and EMD card number
- Patient care provided prior to EMS arrival
- Patient Assessment as required by each specific complaint based protocol
- Past medical history, medications, allergies, and DNR/MOST status
- Trauma and Cardiac Arrest information if relevant to the EMS event or patient
- All times related to the event
- All procedures and their associated time
- All medications administered with their associated time
- Disposition and/or transport information
- Communication with medical control
- Appropriate Signatures (written and/or electronic)

**Purpose:**

The purpose of this policy is to:

- Promote timely and complete EMS documentation.
- Promote quality documentation that can be used to evaluate and improve EMS service delivery, personnel performance, and patient care to the county's citizens.
- Promote quality documentation that will decrease EMS legal and risk management liability.
- Provide a means for continuous evaluation to assure policy compliance.

# EMS Documentation and Data Quality

**Procedure:**

The following procedures shall be implemented to assure policy compliance:

1. The EMS Patient Care Report (PCR) shall be completed as soon as possible after the time of the patient encounter. **Documentation should be completed prior to leaving the destination facility unless call demand dictates otherwise, in which case documentation must be completed prior to the end of the personnel's shift.**

2. **A copy of the patient care report form SHOULD be provided to the receiving medical facility. If the final PCR is not available at the time the patient is left with the emergency department or other healthcare facility, an interim report such as the PreMIS Preliminary Report Form MUST be provided.**

3. The PCR must be completed in the PreMIS System or electronically submitted to the PreMIS System within 24 hours of the EMS event or patient encounter's completion. The EMS data quality feedback provided at the time of the electronic submission into PreMIS should be reviewed and when possible any identified errors will be corrected within each PCR. Each PCR may be electronically resubmitted to PreMIS as many times as needed.

4. The EMS Data Quality Scores for the EMS System, EMS Agency, and individual EMS personnel will be reviewed regularly within the EMS System Peer Review Committee.

# Documentation of Vital Signs

**Policy:**

Every patient encounter by EMS will be documented. Vital signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives some assessment component.

**Purpose:**

To insure:

- Evaluation of every patient's volume and cardiovascular status
- Documentation of a complete set of vital signs

**Procedure:**

1. An **initial** complete set of vital signs includes:
   - Pulse rate
   - Systolic **AND** diastolic blood pressure
   - Respiratory rate
   - Pain / severity (when appropriate to patient complaint)
   - GCS for Injured Patients

2. When no ALS treatment is provided, palpated blood pressures are acceptable for **REPEAT** vital signs.

3. Based on patient condition and complaint, vital signs may also include:
   - Pulse Oximetry
   - Temperature
   - End Tidal CO2 (If Invasive Airway Procedure)
   - Breath Sounds
   - Level of Response

4. If the patient refuses this evaluation, the patient's mental status and the reason for refusal of evaluation must be documented. A patient disposition form must also be completed.

5. Document situations that preclude the evaluation of a complete set of vital signs.

6. Record the time vital signs were obtained.

7. Any abnormal vital sign should be repeated and monitored closely.

# Domestic Violence (Partner and/or Elder Abuse) Recognition and Reporting

**Policy:**

Domestic violence is physical, sexual, or psychological abuse and/or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.

Elder abuse is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and wellbeing of senior citizens.

**Purpose:**

Assessment of an abuse case based upon the following principles:

- **Protect** the patient from harm, as well as protecting the EMS team from harm and liability.
- **Suspect** that the patient may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the patient and family.
- **Collect** as much information and evidence as possible and preserve physical evidence.

**Procedure:**

1. Assess the/all patient(s) for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
2. Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
3. Assess all patients for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Immediately report any suspicious findings to both the receiving hospital (if transported). If an elder or disabled adult is involved, also contact the Department of Social Services (DSS) or equivalent in the county. After office hours, the adult social services worker on call can be contacted by the 911 communications center.
5. EMS personnel should attempt in private to provide the patient with the phone number of the local domestic violence program, or the **National Hotline, 1-800-799-SAFE**.

# EMS Back in Service Time

**Policy:**

All EMS Units transporting a patient to a medical facility shall transfer the care of the patient and complete all required operational tasks to be back in service for the next potential EMS event within 30 minutes of arrival to the medical facility, 90% of the time.

**Definition:**

The EMS Back in Service Time is defined as the time interval beginning with the time the transporting EMS Unit arrives at the medical facility destination and ending with the time the EMS Unit checks back in service and available for the next EMS event.

**Purpose:**

The purpose of this policy is to:

- Assure that the care of each EMS patient transported to a medical facility is transferred to the medical facility staff in a timely manner.
- Assure that the EMS unit is cleaned, disinfected, restocked, and available for the next EMS event in a timely manner.
- Assure that an interim or complete EMS patient care report (PCR) is completed and left with the receiving medical facility documenting, at a minimum, the evaluation and care provided by EMS for that patient (It is acceptable to leave the PreMIS Preliminary Report or equivalent if the final PCR cannot be completed before leaving the facility).
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

**Procedure:**

The following procedures shall be implemented to assure policy compliance:

1. The EMS Unit's priority upon arrival at the medical facility will be to transfer the care of the patient to medical facility staff as soon as possible.

2. EMS personnel will provide a verbal patient report on to the receiving medical facility staff.

3. EMS personnel will provide an interim (PreMIS Preliminary Report or equivalent) or final Patient Care Report (PCR) to the receiving medical facility staff, prior to leaving the facility, that documents at a minimum the patient's evaluation and care provided by EMS prior to arrival at the medical facility. A complete PCR should be completed as soon as possible but should not cause a delay in the EMS Back in Service Time.

4. The EMS Unit will be cleaned, disinfected, and restocked (if necessary) during the EMS Back in Service Time interval.

5. Any EMS Back in Service Time delay resulting in a prolonged EMS Back in Service Time will be documented in Patient Care Report (PCR) as an "EMS Turn-Around Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

6. All EMS Turn-Around Delays will be reviewed regularly within the EMS System Peer Review Committee.

# EMS Dispatch Center Time

**Policy:**

The EMS Dispatch Center Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

**Definition:**

The EMS Dispatch Center Time is defined as the time interval beginning with the time the initial 911 phone call rings at the 911 Communications Center requesting emergency medical services and ending with the dispatch time of the EMS Unit responding to the event.

**Purpose:**

The purpose of this policy is to:

- Provide the safest and most appropriate level of response to all EMS events within the EMS System.
- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

**Procedure:**

The following procedures shall be implemented to assure policy compliance:

1. A public calls into the 911 Communications Center requesting emergency medical assistance will never be required to speak with more than two persons before a formal EMS Unit is dispatched.

2. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.

3. EMS Units will be dispatched hot (with lights and sirens) or cold (no lights and sirens) by the 911 Call Center based on predetermined criteria. If First Responders are dispatched as a component of the EMS response, they should typically be dispatched hot (with lights and sirens).

4. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.

5. EMS Units may, at their discretion, request for a First Responder on Non-First Responder calls in situations where additional resources are required such as manpower, extreme response time of the EMS Unit, need for forcible entry, etc.

# EMS Dispatch Center Time

6. EMS Units dispatched with a cold (no lights and sirens) response, will not upgrade to a hot (with lights and sirens) response **UNLESS**:
   - Public Safety personnel on-scene requests a hot (with lights and sirens) response.
   - Communications Center determines that the patient's condition has changed, and requests you to upgrade to a hot (with lights and sirens) response.

7. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF:**
   - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
   - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
   - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
   - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.

8. Any EMS Dispatch Center Time delays resulting in a prolonged EMS Dispatch Center Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Dispatch Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

9. All EMS Dispatch Delays will be reviewed regularly within the EMS System Peer Review Committee.

# EMS Wheels Rolling (Turn-Out) Time

**Policy:**

The EMS Wheels Rolling (Turn-out) Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

**Definition:**

The EMS Wheels Rolling (Turn-out) Time is defined as the time interval beginning with the time the EMS Dispatch Center notifies an EMS Unit to respond to a specific EMS event and ending with the time the EMS Unit is moving en route to the scene of the event.

**Purpose:**

The purpose of this policy is to:

- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

**Procedure:**

The following procedures shall be implemented to assure policy compliance:

1. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.

2. The EMS Unit Wheels Rolling (Turn-out) time will be less than 90 seconds from time of dispatch, 90% of the time. If a unit fails to check en route within 2:59 (mm:ss), the next available EMS unit will be dispatched.

3. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.

4. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF:**
   - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
   - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
   - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
   - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.

5. Any EMS Wheels Rolling (Turn-out) Time delay resulting in a prolonged EMS Response Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Response Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

6. All EMS Response Delays will be reviewed regularly within the EMS System Peer Review Committee.

# Infant Abandonment

**Policy:**

The North Carolina Infant Homicide Prevention Act provides a mechanism for unwanted infants to be taken under temporary custody by a law enforcement officer, social services worker, healthcare provider, or EMS personnel if an infant is presented by the parent within 7 days of birth. Emergency Medical Services will accept and protect infants who are presented to EMS in this manner, until custody of the child can be released to the Department of Social Services.

> *"A law enforcement officer, a department of social services worker, a health care provider as defined in G.S. 90-21.11 at a hospital or local or district health department, or an* ***emergency medical technician*** *at a fire station shall, without a court order, take into temporary custody an infant under 7 days of age that is voluntarily delivered to the individual by the infant's parent who does not express an intent to return for the infant. An individual who takes an infant into temporary custody under this subsection shall perform any act necessary to protect the physical health and well-being of the infant and shall immediately notify the department of social services. Any individual who takes an infant into temporary custody under this subsection may inquire as to the parents' identities and as to any relevant medical history, but the parent is not required to provide this information."*

**Purpose:**

To provide:

- Protection to infants that are placed into the custody of EMS under this law
- Protection to EMS systems and personnel when confronted with this issue

**Procedure:**

1. Initiate the Pediatric Assessment Procedure.
2. Initiate Newly Born Protocol as appropriate.
3. Initiate other treatment protocols as appropriate.
4. Keep infant warm.
5. Call local Department of Social Services or the county equivalent as soon as infant is stabilized.
6. Transport infant to medical facility as per local protocol.
7. Assure infant is secured in appropriate child restraint device for transport.
8. Document protocols, procedures, and agency notifications in the PCR.

# Patient Without a Protocol

**Policy:**

Anyone requesting EMS services will receive a professional evaluation, treatment, and transportation (if needed) in a systematic, orderly fashion regardless of the patient's problem or condition.

**Purpose:**

- To ensure the provision of appropriate medical care for every patient regardless of the patient's problem or condition.

**Procedure:**

1. Treatment and medical direction for all patient encounters, which can be triaged into an EMS patient care protocol, is to be initiated by protocol.

2. When confronted with an emergency or situation that does not fit into an existing EMS patient care protocol, the patient should be treated by the **Universal Patient Care Protocol** and a **Medical Control Physician** should be contacted for further instructions.

# Physician on Scene

**Policy:**

The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the state of North Carolina.

**Purpose:**

- To identify a chain of command to allow field personnel to adequately care for the patient
- To assure the patient receives the maximum benefit from prehospital care
- To minimize the liability of the EMS system as well as the on-scene physician

**Procedure:**

1. When a non medical-control physician offers assistance to EMS or the patient is being attended by a physician with whom they do not have an ongoing patient relationship, EMS personnel must review the On-Scene Physician Form with the physician. All requisite documentation must be verified and the physician must be approved by on-line medical control.

2. When the patient is being attended by a physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the physician if the orders conform to current EMS guidelines, and if the physician signs the PCR. Notify medical control at the earliest opportunity. Any deviation from local EMS protocols requires the physician to accompany the patient to the hospital.

3. EMS personnel may accept orders from the patient's physician over the phone with the approval of medical control. The paramedic should obtain the specific order and the physician's phone number for relay to medical control so that medical control can discuss any concerns with the physician directly.

# State Poison Center

**Policy:**

The state poison center should be utilized by the 911 centers and the responding EMS services to obtain assistance with the prehospital triage and treatment of patients who have a potential or actual poisoning.

**Purpose:**

The purpose of this policy is to:

- Improve the care of patients with poisonings, envenomations, and environmental/biochemical terrorism exposures in the prehospital setting.
- Provide for the most timely and appropriate level of care to the patient, including the decision to transport or treat on the scene.
- Integrate the State Poison Center into the prehospital response for hazardous materials and biochemical terrorism responses

**Procedure:**

1. The 911 call center will identify and if EMD capable, complete key questions for the Overdose/ Poisoning, Animal Bites/Attacks, or Carbon Monoxide/Inhalation/HazMat emergency medical dispatch complaints and dispatch the appropriate EMS services and/or directly contact the State Poison Center for consultation.
2. If no immediate life threat or need for transport is identified, EMS personnel may conference the patient/caller with the Poison Center Specialist at the **State Poison Center at 800-222-1222**. If possible, dispatch personnel should remain on the line during conference evaluation.
3. The Poison Center Specialist at the State Poison Center will evaluate the exposure and make recommendations regarding the need for on-site treatment and/or hospital transport in a timely manner. If dispatch personnel are not on-line, the Specialist will recontact the 911 center and communicate these recommendations.
4. If the patient is determined to need EMS transport, the poison center Specialist will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may contact medical control for further instructions or to discuss transport options.
5. If the patient is determined not to require EMS transport, personnel will give the phone number of the patient/caller to the Poison Center Specialist. The Specialist will initiate a minimum of one follow-up call to the patient/caller to determine the status of patient.
6. Minimal information that should be obtained from the patient for the state poison center includes:
   - Name and age of patient
   - Time of exposure
   - Signs and symptoms
   - Substance(s) involved
   - Any treatment given
7. Minimal information which should be provided to the state poison center for mass poisonings, including biochemical terrorism and HazMat, includes:
   - Substance(s) involved
   - Signs and symptoms
   - Time of exposure
   - Any treatment given

# Safe Transport of Pediatric Patients

**Policy:**

Without special considerations children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection to pediatric patients during EMS transport.

**Purpose:**

To provide:

- Provide a safe method of transporting pediatric patients within an ambulance.
- Protect the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

**Procedure:**

1. Drive cautiously at safe speeds observing traffic laws.
2. Tightly secure all monitoring devices and other equipment.
3. Insure that all pediatric patient less than 40 lbs are restrained with an approved child restraint device secured appropriately to the stretcher or captains chair.
3. Insure that all EMS personnel use the available restraint systems during the transport.
4. Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible.
5. Do not allow parents, caregivers, or other passengers to be unrestrained during transport.
6. NEVER attempt to hold or allow the parents or caregivers to hold the patient during transport.

# Transport

**Policy:**

All individuals served by the EMS system will be evaluated, treated, and furnished transportation (if indicated) in the most timely and appropriate manner for each individual situation.

**Purpose:**

To provide:

- Rapid emergency EMS transport when needed.
- Appropriate medical stabilization and treatment at the scene when necessary
- Protection of patients, EMS personnel, and citizens from undue risk when possible.

**Procedure:**

1. All trauma patients with significant mechanism or history for multiple system trauma will be transported as soon as possible. The scene time should be 10 minutes or less.

2. All acute Stroke and acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible. The scene time should be 10 minutes or less for acute Stroke patients and 15 minutes or less (with 12 Lead ECG) for STEMI patients

2. Other Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.

3. No patients will be transported in initial response non-transport vehicles.

4. In unusual circumstances, transport in other vehicles may be appropriate when directed by EMS administration.

# Rapid Sequence Induction

**Policy:**

Rapid Sequence Induction (RSI) requires an EMS System or Agency to follow these guidelines to ensure that this invasive procedure is performed in a safe and effective manner to benefit the citizens and guest of North Carolina.

**Purpose:**

The purpose of this policy is to:

- Ensure that the procedure is performed in a safe and effective manner
- Facilitate airway management in appropriate patients

**Procedure:**

1. In addition to other monitoring devices, Waveform Capnography and Pulse Oximetry are required to perform Drug-Assisted Intubation and must be monitored throughout the procedure.

2. Two EMT-Paramedics or higher-level providers must be present and participate in the airway management of the patient during the procedure.

3. All staff must be trained and signed off by the EMS Medical Director prior to performing Rapid Sequence Induction.

4. A printed copy or electronic download from the monitor defibrillator including the pulse oximetry, heart rate, heart rhythm, waveform capnography, and blood pressure must be stored with the patient care report.

5. An EMS Airway Evaluation Form must be completed on all Rapid Sequence Induction Attempts.

6. The EMS Airway Evaluation Form must be reviewed and signed by the EMS Medical Director within 7 days of the Rapid Sequence Induction.

7. All Rapid Sequence Inductions must be reviewed by the EMS System or Agency and issues identified addressed through the System Peer Review Committee.

8. A copy of the EMS Airway Evaluation form for each Rapid Sequence Induction must be forwarded to the appropriate OEMS Regional Office listed below at the end of each month for state review.

Western Regional Office
3305-4 16th Avenue SE
Conover, NC 28613
Telephone: 828-466-5548
Fax: 828-466-5651

Central Regional Office
801 Biggs Drive
Raleigh, NC 27603
Telephone: 919-855-4678
Fax: 919-715-0498

Eastern Regional Office
404 Saint Andrews Dr
Greenville, NC 27834
Telephone: 252-355-9026
Fax: 252-355-9063

In addition, the NC EMS Airway Evaluation Form has been revised to a one page document to improve provider compliance and promote receiving/confirming physician acceptance.

# Patient Refusal of Transport

**Policy:**

All individuals served by the Pitt County EMS System will be evaluated, treated, and offered transportation (if indicated) in a timely and appropriate manner for each patient situation.

**Purpose:**

The purpose of this policy is:

- Assessment of Risk for patient refusing treatment and/or transport.
- Appropriate medical treatment and/or stabilization as is permitted by the patient at the scene.
- Protection of patient, EMS personnel, and citizens from undue risk when possible.
- Physician assertive involvement with patient which may increase percentage of transport for patient's at risk.

**Procedure:**

1. **Patient does not wish to go to the hospital**.
2. Assess the mechanism of injury or illness of the patient.
3. **Assess for Risk** of the patient using the "Patient Refusal of Transport and/or Treatment" form. (Appendix K)
4. **Does patient have any of the above Risks?** (Appendix K)
5. If "No", this would be "Low Risk" and **Consider contacting Medical Control**. Document: good patient assessment hx and patient exam; patient mental status; advise patient to follow-up with their family doctor or call "911" back if they change their mind; and obtain the patient's signature. Return to service or transport patient.
6. If "Yes", this would be "High Risk". Maintain your Safety! *Summon law enforcement if needed. Initiate appropriate evaluation and treatment as the patient will allow. Contact Medical Control. Document: good patient assessment hx and patient exam; patient mental status; advise patient to follow-up with their doctor or call "911" back if they change their mind; and obtain the patient's signature. Return to service and transport patient.

***Based on NC General Statue 122C – 261, 263, 281, and 283**, if an individual is in need of medical treatment and they are intoxicated or mentally ill (includes mental illness from schizophrenic, hypoglycemic and subdural hematoma) then law enforcement has the duty and authority to use appropriate force as needed to bring the individual to a medical facility.

# Medical Errors

**Policy:**

As humans we all make mistakes, but as healthcare professionals when a medical error is identified it is not something we can simply ignore. The most common errors in healthcare are medication administration errors (usually related to the wrong medication being given, the wrong route the medication is delivered, or the wrong dosage being administered).

**Purpose:**

The purpose of this policy is to:

- Prevent medication errors.
- State the procedure should a medication error occur.

**Procedure:**

1. Prior to drug administration every prehospital professional should confirm the correct medication, the route, and the dose as well as the expiration date. Recommend that this "checklist" be done at least twice before any medication is delivered.

2. Critically important is when a medical error occurs prehospital, the information is shared immediately with both the primary nurse as well as the attending physician who are taking care of that patient. Only by doing so, can it be assured that the error that occurred does not have further impact on the patient and result in secondary injury. Also immediately notify your supervisor (ie. – captain, first lieutenant, etc.)

3. Also critically important from a system standpoint, the medical error be shared with quality management. Call the Medical Director's office at (252) 744-2154. Only by notifying all of these key individuals can we be assured that medical errors are properly addressed and taken care of both in the immediate term, as well as long term to improve the system.

# Non-Emergency Medical Transport

**Policy:**

Non-emergency medical transport agencies that are transporting a patient to or from a medical facility may require the assistance of advanced life support EMS professional or other qualified staff. If medical care is required it must be within the scope of practice as delineated by the local (county) EMS System's Medical Director.

**Purpose:**

The purpose of this policy is to:

- Ensure that patients needing advance life support (ALS) care receive appropriate care.
- Prevent undetected adverse medication reaction.

**Procedure:**

1. Vital signs must be taken on all patients prior to transport.
2. Any patient experiencing the following symptoms must be referred to an ALS unit:
   a. Ongoing chest pain
   b. Ongoing difficulty breathing
   c. Mental status different from baseline
   d. Recent fall with suspected injury
   e. Abdominal Pain
   f. Headache
   g. Abnormal Vital Signs (age adjusted, refer to State Drug List B for pediatrics)
      - Adults: RR <8, RR >20, HR <50, HR >100, SBP <90, SBP >180, Temp >100.4F
      - Pediatric: Refer to State Drug List B for normal vital signs
      - All ages: FSBS >400 or room air 02 sat <95%
   h. Patients who have been medicated 30 minutes prior to transport
3. The transporting EMT should ensure that all appropriate documentation accompanies the patient.
4. During transport the EMT must follow all local protocol, policies, and procedures.
5. If the **patient deteriorates during transport: ***
   a. Divert to the closest Emergency Department
   b. Notify the receiving facility via radio or cell phone
   c. **<u>ALS unit must be requested</u>** to rendezvous with the transporting unit.
6. All basic life support (BLS) transports must undergo 100% quality assurance by the transporting agency.
7. Vital signs (BP, pulse, respiratory rate, O2 saturation) must be taken every 5 minutes and documented.
8. Medical command and/or a supervisor must be contacted if any concerns about a transport exist.

**Important:**
*Any healthcare professional may at any time upgrade to an emergency response by simply contacting "911" if they feel the condition warrants emergency ALS transport, the above are only guidelines. When calling "911", identify yourself as a "Non-emergency unit" requesting an emergency agency to respond.

# Induced Hypothermia

**Policy:**

A guideline for maintaining the supplies/equipment for maintaining hypothermia by the paramedic EMS unit.

**Purpose:**

The purpose of this policy is to:

- Assure normal saline solutions are kept at a temperature of 4º C (39.2ºF).
- Assure commercial EMS ice packs or frozen normal saline solution bags (1,000 cc) are available.
- Assure refrigeration (approved standardized refrigeration unit on EMS unit) or small/moderate size cooler (ie. Igloo®) is available for cooling IV solution.
- Assure if a cooler is used, ice for cooling solution is changed every 24-hours.

**Procedure:**

1. Establish a time each day, every 24-hours, that two-four (2-4) normal saline solution (1,000 cc bag) ice bags (if the EMS agency is not utilizing commercial ice packs) are exchanged for fresh frozen normal saline solution ice bags.

2. Establish a time each day, every 24-hours, that fresh ice replaces the melted ice in the bottom of the coolers that contain the two (2) normal saline solution bags. If a standardized refrigeration system is used, check to be sure the two (2) normal saline solutions are being maintained at a 4º Centigrade temperature.

# LEO Requested Blood Draw

**Policy:**

Forensic blood draws may be requested of EMS providers by law enforcement officers (LEO) pursuant to NCGS 20-139.1. Compliance with LEO request is expected except when there is reasonable suspicion that doing so endangers the safety of the patient or EMS provider. Provision for protection against exists within the statute except in cases of negligence.

**Purpose:**

The purpose of this policy is to:

- Facilitate the interaction between LEO and EMS when a request is made for a forensic blood draw.
- Provide clear instruction for the EMS provider increasing their protection through the use of a standard policy.

**Procedure:**

When requested, appropriately credentialed EMS providers will perform forensic blood draws for LEOs unless the feel doing so is unsafe for the patient or provider. Written documentation may be requested on the part of EMS or LEO and should be provided in accordance with the statute.

Blood Draw

1. Ensure safety of provider and patient during procedure.
2. Collect specimen in concordance with Procedure 48 Venous Access: Blood Draw and any instructions on LEO blood draw kit.
3. Document patient encounter including patient demographics, consent or denial of same by patient for blood draw, LEO name and identification number.

*NCGS 20-139.1*

*(d2) Notwithstanding any other provision of law, when a blood or urine sample is requested under subsection (d1) of this section by a law enforcement officer, a physician, registered nurse, emergency medical technician, or other qualified person shall withdraw the blood and obtain the urine sample, and no further authorization or approval is required. If the person withdrawing the blood or collecting the urine requests written confirmation of the charging officer's request for the withdrawal of blood or obtaining urine, the officer shall furnish it before blood is withdrawn or urine obtained. A person requested to withdraw blood or collect urine pursuant to this subsection may refuse to do so only if it reasonably appears that the procedure cannot be performed without endangering the safety of the person collecting the sample or the safety of the person from whom the sample is being collected. If the officer requesting the blood or urine requests a written justification for the refusal, the medical provider who determined the sample could not be collected safely shall provide written justification at the time of the refusal.*

*(d3) When blood is withdrawn or urine collected pursuant to a law enforcement officer's request, neither the person withdrawing the blood nor any hospital, laboratory, or other institution, person, firm, or corporation employing that person, or contracting for the service of withdrawing blood, may be held criminally or civilly liable by reason of withdrawing that blood, except that there is no immunity from liability for negligent acts or omissions. The results of the analysis of blood or urine under this subsection shall be admissible if performed by the State Crime Laboratory or any other hospital or qualified laboratory.*

# Vidant Activation

**Policy:**

This policy is a systematic approach to expedite the care of patients who are experiencing a STEMI, Stroke, or other emergent medical event, and clarifying the serious/critical trauma patient.

**Purpose:**

The purpose of this policy is to:

- Provide quality patient care and EMS services for victims experiencing serious illness or traumatic event.
- Allow prehospital professionals to make a request for resources to be ready upon arrival at the appropriate destination for a STEMI, Code Stroke or Medical Yellow.
- Provide the destination communication specialist the necessary patient information that he/she (communication specialist) can make the appropriate decision regarding trauma team intervention.
- Remember, EMS does not activate the “Trauma Team” or state trauma “color activations”.

**Procedure:**

1. EMS will continue to activate a “STEMI” (patient must have on going ischemic symptoms, ECG interpretation *** Acute MI ***, and Paramedic interpretation is STEMI) by notifying the Vidant Medical Center communication specialist that “this is a confirmed STEMI, activate the Cath Lab. Confirm activate the Cath Lab.” This request should be responded by the communication specialist that they confirm your STEMI request and will activate the Cath Lab system. If you are in doubt and have the ability to transmit the ECG, transmit as soon as possible and ask the ED physician to review while you are enroute to the hospital.
2. EMS will continue to activate a “Code Stroke” by following the Stroke program guidelines and notify the destination communication specialist that this is a “Code Stroke”. Give the communication specialist a brief patient report on the patient’s signs and symptoms that support your reason(s) for a Code Stroke activation.
3. EMS desiring to have the destination communication specialist to alert the emergency department of a “Medical Yellow” will need to identify the treatment/conditions that would warrant an activation based on the “EMS Medical Yellow Alert Guidelines” sheet (Appendix A) and verbalize them to the communication specialist.
4. EMS transporting a serious/critical trauma patient would need to supply the destination communication specialist a brief report (age, gender, mechanism, concerning injuries/condition and an ETA) so he/she (communication specialist) can follow their guidelines regarding emergency department/trauma notifications.

# 2012 EMS Procedures

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# 12 Lead ECG

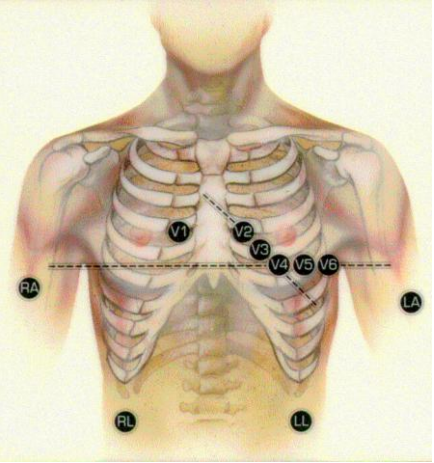
| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope

**Procedure:**

1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
   - RA -Right arm
   - LA -Left arm
   - RL -Right leg
   - LL -Left leg
   - V1 -4th intercostal space at right sternal border
   - V2 -4th intercostal space at left sternal border
   - V3 -Directly between V2 and V4
   - V4 -5th intercostal space at midclavicular line
   - V5 -Level with V4 at left anterior axillary line
   - V6 -Level with V5 at left midaxillary line




8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data by fax to the appropriate hospital.
12. Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. Download data as per guidelines and attach a copy of the 12 lead to the ACR.
15. Document the procedure, time, and results on/with the patient care report (PCR)

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: BIAD-Combitube

**Clinical Indications for Blind Insertion Airway Device (BIAD) Use:**

- Inability to adequately ventilate a patient with a Bag Valve Mask (BVM) or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be ≥ 5 feet and ≥16 years of age and must be unconscious.

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Procedure:**

1. Preoxygenate and hyperventilate the patient.
2. Lubricate the tube.
3. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
4. Gently insert the tube until the teeth are between the printed rings.
5. Inflate line 1 (blue pilot balloon) leading to the pharyngeal cuff with 100 cc of air.
6. Inflate line 2 (white pilot balloon) leading to the distal cuff with 15 cc of air.
7. **Ventilate the patient through the longer blue tube**.
   - Auscultate for breath sounds and sounds over the epigastrium.
   - Look for the chest to rise and fall.
8. **If breath sounds are positive and epigastric sounds are negative, continue ventilation through the blue tube. The tube is in the esophagus.**
   - In the esophageal mode, stomach contents can be aspirated through the #2, white tube relieving gastric distention.
9. If breath sounds are negative and epigastric sounds are positive, attempt ventilation through the shorter, #2 white tube and reassess for lung and epigastric sounds. If breath sounds are present and the chest rises, you have intubated the trachea and continue ventilation through the shorter tube.
10. The device is secured by the large pharyngeal balloon.
11. **Confirm tube placement using end-tidal $CO_2$ detector or esophageal bulb device.**
12. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
13. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

- **Endotracheal intubation with a Combitube in Place (Only if ventilation unsuccessful):**
  - If you cannot ventilate with the Combitube in place, you should remove the tube, open and suction the airway, and ventilate with a BVM prior to intubation or re-establishment of another BIAD.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Airway: BIAD King

**Clinical Indications for Blind Insertion Airway Device (BIAD) Use:**

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be unconscious.

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Procedure:**

1. Preoxygenate and hyperventilate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflate the pilot balloon with 45-90 ml of air depending on the size of the device used.
7. **Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated**.
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. **Confirm tube placement using end-tidal $CO_2$ detector.**
11. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
12. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Airway: BIAD-Laryngeal Mask Airway (LMA)

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications for Blind Insertion Airway Device (BIAD) Use:**

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- **This airway does not prevent aspiration of stomach contents.**

**Clinical Contraindications:**

- Deforming Facial Trauma
- Pulmonary Fibrosis
- Morbid Obesity

**Procedure:**

1. Select the appropriate tube size for the patient.
2. Check the tube for proper inflation and deflation.
3. Completely deflate the tube prior to insertion.
4. Lubricate with a water-soluble jelly.
5. Pre-Oxygenate the patient with 100% Oxygen
6. Insert the LMA into the hypopharynx until resistance is met.
7. Inflate the cuff until a seal is obtained.
8. Connect the LMA to an ambu bag and assess for breath sounds and air entry.
9. **Confirm tube placement using end-tidal $CO_2$ detector or esophageal bulb device.**
10. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
11. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
12. Re-verify LMA placement after every move and upon arrival in the ED
13. Document the procedure, time, and result (success) on/with the patient care report (PCR)
14. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.

# Airway: CPAP

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:**

- CPAP is indicated in all patients whom inadequate ventilation is suspected that is not associated with Asthma. This could be as a result of pulmonary edema, pneumonia, COPD, etc.

**Clinical Contraindications for Continuous Positive Airway Pressure (CPAP) Use:**

- Decreased Mental Status.
- Facial features or deformities that prevent an adequate mask seal.
- Excessive respiratory secretions.

**Procedure:**

1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. If the Positive End Expiratory Pressure (PEEP) is adjustable on the CPAP device adjust the PEEP beginning at 0 $cmH_20$ of pressure and slowly titrate to achieve a positive pressure as follows:
   - 5 – 10 $cmH_20$ for Pulmonary Edema, Near Drowning, possible aspiration or pneumonia
   - 3 – 5 cm $H_20$ for COPD
7. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
8. Titrate oxygen levels to the patient's response. Many patients respond to low FIO2 (30-50%).
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for optimal use of the CPAP device.
10. Document time and response on patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Cricothyrotomy-Surgical

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed.

**Contraindications:**

- Inability to identify the cricothyoid membrane.
- Children under the age of 8 years (Melker kits used locally are not designed specially for pediatric use, per the manufacturer).
- Burns or infection over the insertion site.
- Direct trauma obscuring the cricothyroid membrane.

**Procedure:**

1. Don appropriate protective gloves, mask and eye protection (a gown if possible).
2. Have suction and supplies available and ready (includes the cuff for any leaks by inflating and deflating the cuff prior to insertion).
3. Advance the handled dilator, tapered end first, into the connector end of the airway catheter until the handle stops against the connector. Use of lubrication on the surface of the dilator may enhance fit and placement of the airway catheter.
4. Identify the cricothyroid membrane between the cricoid and thyroid cartilages.
5. Prep the area with an antiseptic (Betadine).
6. Carefully palpate the cricothyroid membrane and while stabilizing the cartilage, make about a one inch vertical incision in the midline, through the skin and subcutaneous tissue.
7. Attach the supplied syringe (6 cc) to the introducer needle and advance the needle through the incision into the airway at a 45 – degree angle to the frontal plane in a caudad direction. Entrance into the airway can be confirmed by aspiration on the syringe, resulting in free air return.
8. Remove only the syringe from the needle, leaving the needle in place.
9. Advance the soft, flexible end of the wire guide through the needle and into the airway several centimeters.
10. Remove the needle, leaving the wire guide in place. Note: do not let go of the wire.
11. Advance the airway catheter/dilator assembly over the wire guide until the proximal stiff end of the wire guide is completely through and visible at the handle end of the dilator. **It is important to continually visualize the proximal end of the wire guide during the airway insertion procedure to prevent its inadvertent loss into the trachea.**
12. Maintaining wire guide position, continue to advance the airway catheter/dilator assembly over the wire guide with a reciprocating motion completely into the trachea. **Take care in not advancing the tip of the dilator beyond the tip of the wire guide within the trachea.**
13. Remove the wire guide and dilator simultaneously.
14. Inflate the cuff with 5-6 cc of air using a syringe and ventilate the patient while manually stabilizing the tube.
15. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise and fall, end-tidal CO2 detector, etc.). Esophageal bulb devices are not accurate with this procedure. If available, apply capnography and record readings on scene, enroute to the hospital and at the hospital.
16. Secure the tube.

**Local Requirements:**

- Complete an annual skill review inclusive of the indications, contraindications, technique and possible complications of the procedure.

# Airway: Endotracheal Tube Introducer (Bougie)

| I | EMT- I | I |
|---|---|---|
| P | EMT- P | P |

**Clinical Indications:**

- Patients meet clinical indications for oral intubation
- Initial intubation attempt(s) unsuccessful
- Predicted difficult intubation

**Contraindications:**

- Three attempts at orotracheal intubation (utilize failed airway protocol)
- Age less than eight (8) or ETT size less than 6.5 mm

**Procedure:**

1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ET tube without stylet, test cuff and prepare suction;
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed;
5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized;
6. Once inserted, gently advance the Bougie until you meet resistance or "hold-up" (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated);
7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie;
8. Gently advance the Bougie and loaded ET tube until you have hold-up again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie;
9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT(this will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT);
11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie;
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 to 10 cc of air, auscultate for equal breath sounds and reposition accordingly;
13. When final position is determined secure the ET tube, reassess breath sounds, apply end tidal $CO_2$ monitor, and record and monitor readings to assure continued tracheal intubation.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Airway: Foreign Body Obstruction

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

**Procedure:**

1. Assess the degree of foreign body obstruction
   - Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
   - In severe foreign-body obstructions, the patient may not be able to make a sound. The victim my clutch his/her neck in the universal choking sign.
2. **For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
4. **For adults**, a combination of maneuvers may be required.
   - First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
   - If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy
5. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.
6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
7. In unresponsive patients, EMT-Intermediate and EMT-Paramedic level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magil forceps.
8. Document the methods used and result of these procedures in the patient care report (PCR).

**Certification Requirements:**

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway Intubation Confirmation – End-Tidal $CO_2$ Detector

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- The End-Tidal $CO_2$ detector shall be used with any Endotracheal Tube or Blind Insertion Airway Device use.

**It is strongly recommended that continuous Capnography be used in place of or in addition to the use of an End-Tidal $CO_2$ detector.**

**Procedure:**

1. Attach End-Tidal $CO_2$ detector to the Blind Insertion Airway Device or the Endotracheal Tube.
2. Note color change after providing six (6) good ventilations using the BVM, only if waveform capnography is not available. A color change or $CO_2$ detection will be documented on each respiratory failure or cardiac arrest patient.
3. The $CO_2$ detector shall remain in place with the airway and monitored throughout the prehospital care and transport unless continuous Capnography is used. Any loss of $CO_2$ detection or color change is to be documented and monitored as procedures are done to verify or correct the airway problem.
4. Tube placement should be verified frequently and always with each patient move or loss of color change in the End-Tidal $CO_2$ detector.
5. Document the procedure and the results on/with the Patient Care Report (PCR) as well as on the Airway Evaluation Form.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Intubation Confirmation-Esophageal Bulb

| | | |
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| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- To assist in determining and documenting the correct placement of an Endotracheal or Nasotracheal tube.

**It is strongly recommended that continuous Capnography be used in place of or in addition to the use of an Esophageal Bulb device.**

**Procedure:**

1. Complete intubation as per Airway-Intubation Oral or Airway-Intubation Nasal procedures.
2. Place the bulb device over the proximal end of the ETT or NTT. Squeeze the bulb to remove all air prior to securing the bulb on the tube.
3. Once secured on the tube, release the bulb.
4. If the bulb expands evenly and easily, this indicates probable tracheal intubation. Assessment of the patient's breath sounds bilaterally should also be performed.
5. If the bulb does not expand easily, this indicates possible esophageal intubation and the need to reassess the airway.
6. Document time and result in the patient care report (PCR).
7. Do not repeat test since a false positive test can result from instillation of air into the esophagus.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Rapid Sequence Intubation

| P | EMT- P | P |
|---|---|---|

**Clinical Indications:**

- Need for advanced airway control in a patient who has a gag reflex
- or trismus (jaw clinching)
- Failure to protect the airway. Unable to ventilate and / or oxygenate. Impending airway compromise
- A minimum of 2 EMT-Paramedics on scene able to participate in patient care

**Clinical Contraindications:**

- Age ≤ 11 years of age.
- Refer to drug list for contraindications regarding use of Succinylcholine and Rocuronium.

**Procedure:**

1. Perform focused neurological exam
2. Evaluate for difficult airway (LEMON)-see appendix
3. Prepare equipment (intubation kit, BVM, suction, RSI medications, BIAD, Cricothyrotomy kit, waveform capnography, other airway adjuncts as available)
4. Pre-oxygenate patient with 100% oxygen via NRB mask or BVM. Apneic oxygenation: May continue high-flow oxygen via NC during entire procedure
5. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
6. Ensure functioning IV / IO access. Two (2) IV sites are preferable
7. Stroke / head trauma suspected? If yes, Lidocaine 1.5 mg/kg (per local medical director)
8. In-line c-spine stabilization by second caregiver (in setting of trauma)
9. Administer Etomidate (preferred agent) or Ketamine by rapid IV push
10. Administer Succinylcholine (preferred agent), await fasciculation and jaw relaxation or Rocuronium
11. Apply cricoid pressure (by third caregiver). This is optional and may improve or worsen view
12. Intubate trachea
13. Verify ET placement through auscultation, Capnography, and Pulse Oximetry
14. May repeat Succinylcholine or Rocuronium if inadequate relaxation
15. Release cricoid pressure (if utilized) and secure tube
16. **Continuous Capnography and Pulse Oximetry is required for RSI. Pre-intubation, minimal during intubation, and post-intubation readings must be recorded in the PCR.**
17. Re-verify tube placement after every move and upon arrival in the ED
18. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices/methods used to confirm initial tube placement initially and with patient movement.
19. Consider placing a gastric tube to clear stomach contents after the airway is secured.
20. **Completion of the Airway Evaluation Form is required including a signature from the receiving physician at the Emergency Department confirming proper tube placement.**

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Airway: Intubation Nasotracheal

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|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

## Clinical Indications:

- A spontaneously breathing patient in need of intubation (inadequate respiratory effort, evidence of hypoxia or carbon dioxide retention, or need for airway protection).
- Rigidity or clenched teeth prohibiting other airway procedures.
- Patient must be 12 years of age or older.

## Procedure:

1. Premedicate the patient with nasal spray.
2. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
3. Preoxygenate the patient. Lubricate the tube. The use of a BAAM device is recommended.
4. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
5. Continue to pass the tube listening for air movement and looking for to and fro vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.
6. Gently and evenly advance the tube through the glottic opening on the inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
7. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
8. Auscultate for bilaterally equal breath sounds and absence of sounds of the epigastrium. Observe for symmetrical chest expansion. The 15mm adapter usually rests close to the nostril with proper positioning.
9. Inflate the cuff with 5-10 cc of air.
10. **Confirm tube placement using an end-tidal $CO_2$ monitoring or esophageal bulb device.**
11. Secure the tube.
12. Reassess airway and breath sounds after transfer to the stretcher and during transport. These tubes are easily dislodged and require close monitoring and frequent reassessment.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).
14. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
15. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

## Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Intubation Oral Tracheal

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- A component of Drug Assisted Intubation

**Procedure:**

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube (and stylette, if used), have suction ready.
3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).
4. Limit each intubation attempt to 30 seconds with BVM between attempts.
5. Visualize tube passing through vocal cords.
6. **Confirm and document tube placement using an end-tidal $CO_2$ monitoring or esophageal bulb device.**
7. Inflate the cuff with 3-to10 cc of air; secure the tube to the patient's face.
8. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with bag-valve mask.
9. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
10. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
11. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
13. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
14. **It is strongly recommended that an Airway Evaluation Form be completed with all intubations**

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Airway – Nebulizer Inhalation Therapy

**Clinical Indications:**

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

- Patients experiencing bronchospasm.

**Procedure:**

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (such as Albuterol or other approved drug) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.
9. Document the treatment, dose, and route on/with the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Respirator Operation

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Transport of an intubated patient

**Procedure:**

1. Confirm the placement of tube as per airway protocol.
2. Ensure adequate oxygen delivery to the respirator device.
3. Preoxygenate the patient as much as possible with bag-valve mask.
4. Remove BVM and attach tube to respiration device.
5. Per instructions of device, set initial respiration values. For example, set an inspiratory:expiratory ratio of 1:4 (for every 1 second of inspiration, allow 4 seconds and expiration) with a rate of 12 to 20.
6. Assess breath sounds. Allow for adequate expiratory time. Adjust respirator setting as clinically indicated.
7. **It is required that patients on a transport ventilator should be monitored continuously through Capnography and Pulse Oximetry. The ventilatory rate should adjusted to maintain a pulse oximetry of >90 (or as high as possible) while maintaining a pCO2 of 30-35.**
8. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the respirator, remove the respirator and resume bag-valve mask ventilations.
9. Document time, complications, and patient response on the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Suctioning-Advanced

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, Combitube, tracheostomy tube, or a cricothyrotomy tube.

**Procedure:**

1. Ensure suction device is in proper working order.
2. Preoxygenate the patient as is possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway into the catheter will be placed as guides, measure the depth desired for the catheter (judgment must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes).
5. If applicable, remove ventilation devices from the airway.
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
7. Once the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
8. A small amount of Normal Saline (10 ml) may be used if needed to loosen secretions for suctioning.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient
10. Document time and result in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Suctioning-Basic

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

**Procedure:**

1. Ensure suction device is in proper working order with suction tip in place.
2. Preoxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
9. Record the time and result of the suctioning in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Airway: Tracheostomy Tube Change

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Presence of Tracheostomy site.
- Urgent or emergent indication to change the tube, such as obstruction that will not clear with suction, dislodgement, or inability to oxygenate/ventilate the patient without other obvious explanation.

**Procedure:**

1. Have all airway equipment prepared for standard airway management, including equipment of orotracheal intubation and failed airway.
2. Have airway device (endotracheal tube or tracheostomy tube) of the same size as the tracheostomy tube currently in place as well as 0.5 size smaller available (e.g., if the patient has a #6.0 Shilley, then have a 6.0 and a 5.5 tube).
3. Lubricate the replacement tube(s) and check the cuff.
4. Remove the tracheostomy tube from mechanical ventilation devices and use a bag-valve apparatus to pre-oxygenate the patient as much as possible.
5. Once all equipment is in place, remove devices securing the tracheostomy tube, including sutures and/or supporting bandages.
6. If applicable, deflate the cuff on the tube. If unable to aspirate air with a syringe, cut the balloon off to allow the cuff to lose pressure.
7. Remove the tracheostomy tube.
8. Insert the replacement tube. Confirm placement via standard measures except for esophageal detection (which is ineffective for surgical airways).
9. If there is any difficultly placing the tube, re-attempt procedure with the smaller tube.
10. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation (as per protocol). **More difficulty with tube changing can be anticipated for tracheostomy sites that are immature – i.e., less than two weeks old. Great caution should be exercised in attempts to change immature tracheotomy sites.**
11. Document procedure, confirmation, patient response, and any complications in the PCR

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment for this skill should include direct observation at least once per certification cycle.

# Airway: Ventilator Operation

| P | EMT- P | P |
|---|---|---|

**Clinical Indications:**

- Management of the ventilation of a patient during a prolonged or interfacility transport of an intubated patient.

**Procedure:**

1. Transporting personnel should review the operation of the ventilator with the treating personnel (physician, nurse, or respiratory therapy) in the referring facility prior to transport if possible.
2. All ventilator settings, including respiratory rate, $FiO_2$, mode of ventilation, and tidal volumes should be recorded prior to initiating transport. Additionally, the recent trends in oxygen saturation experienced by the patient should be noted.
3. Prior to transport, specific orders regarding any anticipated changes to ventilator settings as well as causes for significant alarm should be reviewed with the referring medical personnel as well as medical control.
4. Once in the transporting unit, confirm adequate oxygen delivery to the ventilator.
5. Frequently assess breath sounds to assess for possible tube dislodgment during transfer.
6. Frequently assess the patient's respiratory status, noting any decreases in oxygen saturation or changes in tidal volumes, peak pressures, etc.
7. Note any changes in ventilator settings or patient condition in the PCR.
8. Consider placing an NG or OG tube to clear stomach contents.
9. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
10. If any significant change in patient condition, including vital signs or oxygen saturation or there is a concern regarding ventilator performance/alarms, remove the ventilator from the endotracheal tube and use a bag-valve mask with 100% $O_2$. Contact medical control immediately.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Arterial Access: Blood Draw

**Clinical Indications:**

P | EMT- P | P

- Arterial blood gas (ABG) analysis
- Other needs for arterial blood as indicated by medical control

**Procedure:**

1. Assemble ABG kit, ice, alcohol wipes, and gloves.
2. Determine if there is any history of trauma or any other difficulties with circulation to either hand. If a problem does exist, do not use that extremity for the blood draw.
3. Palpate the radial pulse just proximal to the wrist.
4. Clean the skin with an alcohol wipe.
5. Insert the ABG syringe at a 45 to 60 degree angle over the area of the pulse.
6. Slowly advance the syringe, watching for return of arterial blood. You do not need to aspirate but rather allow the syringe to fill from the arterial pressure.
7. Once the sample has been acquired, remove and discard the needle in an approved fashion.
8. Place the small airtight cap over the needle port on the syringe. Remove air from the sample by inverting the syringe and pressing the plunger on the syringe until a small amount of the sample enters the airtight cap.
9. Place the sample on ice as soon as possible
10. Hold pressure over the blood draw sight for at least 5 minutes before checking to ensure hemostasis.
11. Record procedure, time, and any complications in patient care report (PCR)

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Arterial Access: Line Maintenance

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- Transport of a patient with an existing arterial line.

**Procedure:**

1. Make certain arterial line is secured prior to transport, including intersection of arterial catheter and IV/Monitoring lines.
2. Use available equipment for monitoring of arterial pressures via arterial line.
3. Do not use the arterial line for administration of any fluids or medications.
4. If there is any question regarding dislodgement of the arterial line and bleeding results, remove the line and apply direct pressure over the site for at least five minutes before checking to ensure hemostasis.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Assessment: Adult

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Any patient requesting a medical evaluation that is too large to be measured with a Broselow-Luten Resuscitation Tape.

**Procedure:**

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess need for additional resources.
3. Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
4. Assess mental status (e.g., AVPU) and disability (e.g., GCS).
5. Control major hemorrhage and assess overall priority of patient.
6. Perform a focused history and physical based on patient's chief complaint.
7. Assess need for critical interventions.
8. Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
9. Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions.
10. Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Pain Assessment and Documentation

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

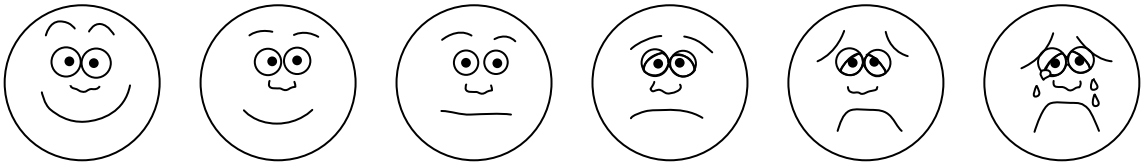
- Any patient with pain.

**Definitions:**

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

**Procedure:**

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
2. Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment, and with each set of vitals.
3. Pain should be assessed using the appropriate approved scale.
4. Three pain scales are available: the 0 – 10, the Wong - Baker "faces", and the FLACC.
   - 0 – 10 Scale: the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
   - Wong – Baker "FACES" scale: this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.



| 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|
| No hurt | Hurts little bit | Hurts little more | Hurts even more | Hurts whole lot | Hurts worst |

From Hockenberry MJ, Wilson D, Winkelstein ML: Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

   - FLACC scale: this scale has been validated for measuring pain in children with mild to severe cognitive impairment and in pre-verbal children (including infants).

| CATEGORIES | SCORING | | |
|---|---|---|---|
| | 0 | 1 | 2 |
| FACE | No particular expression or smile | Occasional grimace or frown, withdrawn, disinterested. | Frequent to constant quivering chin, clenched jaw. |
| LEGS | Normal position or relaxed. | Uneasy, restless, tense. | Kicking, or legs drawn up. |
| ACTIVITY | Lying quietly, normal position moves easily. | Squirming, shifting back and forth, tense. | Arched, rigid or jerking. |
| CRY | No cry, (awake or asleep) | Moans or whimpers; occasional complaint | Crying steadily, screams or sobs, frequent complaints. |
| CONSOLABILITY | Content, relaxed. | Reassured by occasional touching hugging or being talked to, distractable. | Difficulty to console or comfort |

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Assessment: Pediatric

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Any child that can be measured with the Broselow-Luten Resuscitation Tape.

**Procedure:**

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess patient using the pediatric triangle of ABCs:
   - Airway and appearance: speech/cry, muscle tone, inter-activeness, look/gaze, movement of extremities
   - Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning
   - Circulation to skin: pallor, mottling, cyanosis
3. Establish spinal immobilization if suspicion of spinal injury
4. Establish responsiveness appropriate for age (AVPU, GCS, etc.)
5. Color code using Broselow-Luten tape
6. Assess disability (pulse, motor function, sensory function, papillary reaction)
7. Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
8. Record vital signs (BP > 3 years of age, cap refill < 3 years of age)
9. Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
10. Treat chief complaint as per protocol

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Blood Glucose Analysis

**Clinical Indications:**

- Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Procedure:**

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings are noted, and/or as recommended by the manufacturer and document in the log.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Capnography

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Capnography shall be used when available with the use of all invasive airway procedures including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography should also be used when possible with CPAP.

**Procedure:**

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note $CO_2$ level and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of $CO_2$ detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Cardiac: External Pacing

| P | EMT- P | P |
|---|---|---|

**Clinical Indications:**

- Patients with symptomatic bradycardia (less than 60 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
  - Chest Pain
  - Hypotension
  - Pulmonary Edema
  - Altered Mental Status, Confusion, etc.
  - Ventricular Ectopy
- Asystole, pacing must be done early to be effective.
- PEA, where the underlying rhythm is bradycardic and reversible causes have been treated.

**Procedure:**

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
   - One pad to left mid chest next to sternum
   - One pad to mid left posterior chest next to spine.
3. Rotate selector switch to pacing option.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Slowly increase output until capture of electrical rhythm on the monitor.
7. If unable to capture while at maximum current output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Cardiopulmonary Resuscitation (CPR)

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Basic life support for the patient in cardiac arrest

**Procedure:**

1. Assess the patient's level of responsiveness (shake and shout)
2. If no response, open the patient's airway with the head-tilt, chin-lift and look, listen, and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway.
3. Check for pulse (carotid for adults and older children, brachial for infants) for at least 10 seconds. If no pulse, begin chest compressions based on chart below:

| Age | Location | Depth | Rate |
|---|---|---|---|
| **Infant** | Over sternum, between nipples (inter-mammary line), 2-3 fingers | 1.5 inches | At least 100/minute |
| **Child** | Over sternum, just cephalad from xyphoid process, heel of one hand | 2 inches | At least 100/minute (3 compressions Every 2 seconds) |
| **Adult** | Over sternum, just cephalad from xyphoid process, hands with interlocked fingers | At least 2 inches | At least 100/minute (3 compressions Every 2 seconds) |

4. If patient is an adult, go to step 5. If no respiratory effort in a pediatric patient, give two ventilations. If air moves successfully, go to step 5. If air movement fails, proceed to the Airway Obstruction Procedure.
5. Go to Cardiac Arrest Procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure
6. Provide 8 - 10 breaths per minute with the BVM. Use EtCO2 to guide your ventilations as directed in the Cardiac Arrest Protocol.
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions ( < 5 seconds with a maximum of 10 seconds) are allowed for rhythm analysis, defibrillation, and performance of procedures
8. Document the time and procedure in the Patient Care Report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Cardioversion

| P | EMT- P | P |
|---|---|---|

**Clinical Indications:**

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

**Procedure:**

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. Consider the use of pain or sedating medications.
4. Set energy selection to the appropriate setting.
5. Set monitor/defibrillator to synchronized cardioversion mode.
6. Make certain all personnel are clear of patient.
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient’s rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.
9. If the patient’s condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
10. Repeat until maximum setting or until efforts succeed. Consider discussion with medical control if cardioversion is unsucessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle., or other mechanisms as deemed appropriate by the local EMS System.

# Chest Decompression

**Clinical Indications:**

P | EMT- P | P

- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
  - Jugular vein distention.
  - Tracheal deviation away from the side of the injury (often a late sign).
  - Absent or decreased breath sounds on the affected side.
  - Hyper-resonance to percussion on the affected side.
  - Increased resistance when ventilating a patient.

- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

**Procedure:**

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
   - Locate the second intercostals space in the mid-clavicular line on the same side as the pneumothorax.
   - If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.
   - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (14 gauge for adults) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.
5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
6. Remove the needle, leaving the plastic catheter in place.
7. Secure the catheter hub to the chest wall with dressings and tape.
8. Consider placing a finger cut from an exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note – don’t waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.

# Childbirth

**Clinical Indications:**

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

- Imminent delivery with crowning

**Procedure:**

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Protocol** for further treatment.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# CNS Catheter: Epidural Catheter Maintenance

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- Presence of an epidural catheter in a patient requiring transport

**Procedure:**

1. Prior to transport, ensure catheter is secure and that transport personnel are familiar with medication(s) being delivered and devices used to control medication administration.
2. No adjustments in catheter position are to be attempted.
3. No adjustments in medication dosage or administration are to be attempted without direct approval from on-line medical control.
4. Report any complications immediately to on-line medical control.
5. Document the time and dose of any medication administration or rate adjustment in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# CNS Catheter: Ventricular Catheter Maintenance

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- Transport of a patient with an intra-ventricular catheter in place

**Procedure:**

1. Prior to transport, ensure the catheter is secure.
2. Prior to transport, determine from the referring hospital/physician the desired patient position (e.g., supine, head of bed elevated 30 degrees, etc.).
3. Prior to transport, determine the height at which the drain is to be maintained, given the patient position desired from #2 above (if applicable).
4. Do not manipulate or move the drain.
5. If the patient or height of the drain is altered, immediately correct based on the pre-determined configuration in step 2 and 3 above.
6. Report any problems immediately to on-line medical control.
7. Document the time and any adjustments or problems in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Decontamination

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

**Procedure:**

1. In coordination with HazMAT and other Emergency Management personnel, establish hot, warm and cold zones of operation.
2. Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
3. In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
   - Removal of patients from Hot Zone
   - Simple removal of clothing
   - Irrigation of eyes
   - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
4. Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination.
5. Assist patients with technical decontamination (unless contraindicated based on #3 above). This may include removal of all clothing and gentle cleansing with soap and water. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided.
6. Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel affects for law enforcement.
7. Monitor all patients for environmental illness.
8. Transport patients per local protocol.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Defibrillation: Automated

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Patients in cardiac arrest (pulseless, non-breathing).
- Age < 8 years, use Pediatric Pads if available.

**Contraindication:**

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

**Procedure:**

1. **If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Apply defibrillator pads per manufacturer recommendations. Based on 2010 guidelines, place pads preferably in AP or AL position when implanted devices (pacemakers, AICDs) occupy preferred pad positions and attempt to avoid placing directly over device.
3. Remove any medication patches on the chest and wipe off any residue.
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.
5. Activate AED for analysis of rhythm.
6. **Stop CPR and clear the patient** for rhythm analysis. Keep interruption in CPR as brief as possible.
7. Defibrillate if appropriate by depressing the "shock" button. **Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.** The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If "no shock advised" appears, perform CPR for two minutes and then reanalyze.
11. Transport and continue treatment as indicated.
12. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**
13. **If pulse returns please use the Post Resuscitation Protocol**

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Defibrillation: Manual

| P | EMT- P | P |
|---|---|---|

**Clinical Indications:**

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

**Procedure:**

1. **Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position
   - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS
   - Pads: anterior-posterior position

   For patients with implanted pacers/defibrillators, paddles or pads can be in AP or AL positions. The presence of implanted pacers/defibrillators should not delay defibrillation. Attempt to avoid placing paddles or pads directly above device.
4. Set the appropriate energy level
5. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**
6. If using paddles, assure proper contact by applying 25 pounds of pressure on each paddle.
7. **Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
8. Deliver the countershock by depressing the discharge button(s) when using paddles, or depress the **shock button** for hands free operation.
9. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
10. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
11. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Gastric Tube Insertion

**Clinical Indications:**

P | EMT- P | P

- Gastric decompression in intubated patients or for administration of activated charcoal in patients with altered mental status.

**Procedure:**

1. Estimate insertion length by superimposing the tube over the body from the nose to the stomach.
2. Flex the neck **if not contraindicated** to facilitate esophageal passage.
3. Liberally lubricate the distal end of the tube and pass through the patient's nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates. This increases the difficulty of the insertion and may cause bleeding.
4. In the setting of an intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred after securing airway.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 20cc of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
7. Secure the tube.
8. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Injections: Subcutaneous and Intramuscular

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- When medication administration is necessary and the medication must be given via the SQ (not auto-injector) or IM route or as an alternative route in selected medications.

**Procedure:**

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for subcutaneous injection is the arm.
   - Injection volume should not exceed 1 cc.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
   - Injection volume should not exceed 1 cc for the arm
   - Injection volume should not exceed 2 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Expose the selected area and cleanse the injection site with alcohol.
8. Insert the needle into the skin with a smooth, steady motion

   **SQ: 45-degree angle skin pinched** | **IM: 90-degree angle skin flattened**

9. Aspirate for blood
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. Document the medication, dose, route, and time on/with the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Orthostatic Blood Pressure Measurement

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization. Orthostatic vital signs are not routinely recommended.
- Patients ≥ 8 years of age, or patients larger than the Broselow-Luten tape
- Orthostatic Vital Signs are not sensitive nor specific for volume loss / dehydration and may induce syncope in some cases. Assessment of orthostatic vital signs are not routinely recommended. Local Medical Director should indicate and educate on situations where they may be helpful.

**Procedure:**

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 30 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Pulse Oximetry

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Patients with suspected hypoxemia.

**Procedure:**

1. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
2. Allow machine to register saturation level.
3. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
4. Verify pulse rate on machine with actual pulse of the patient.
5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
7. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain. Supplemental oxygen is not required if the oxyhemoglobin saturation is >= 94%, unless there are obvious signs of heart failure, dyspneic, or hypoxic to maintain to 94%.
10. Factors which may reduce the reliability of the pulse oximetry reading include but are not limited to:
    - Poor peripheral circulation (blood volume, hypotension, hypothermia)
    - Excessive pulse oximeter sensor motion
    - Fingernail polish (may be removed with acetone pad)
    - Carbon monoxide bound to hemoglobin
    - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
    - Jaundice
    - Placement of BP cuff on same extremity as pulse ox probe.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Reperfusion Checklist

**Clinical Indications:**

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

Rapid evaluation of a patient with suspected acute stroke and/or acute myocardial infarction (STEMI) to:

- Determine eligibility and potential benefit from fibrinolysis..
- Rapid identification of patients who are not eligible for fibrinolysis and will require interventional therapy.

**Procedure:**

1. Follow the appropriate protocol for the patient's complaint to assess and identify an acute condition which could potentially benefit from fibrinolysis. If a positive finding is noted on one of the following assessments, proceed to step 2.
   - Perform a 12-lead ECG to identify an acute ST elevation myocardial infarction (STEMI).
   - Perform the Los Angles Pre-hospital Stroke Screen to identify an acute stroke
2. Complete the Reperfusion Check Sheet to identify any potential contraindications to fibrinolysis. (See Appendix)
   - Systolic Blood Pressure greater than 180 mm Hg
   - Diastolic Blood Pressure greater than 110 mm Hg
   - Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
   - History of structural Central Nervous System disease (age >= 18, history of aneurysm or AV-malformation, tumors, masses, hemorrhage, etc.)
   - Significant closed head or facial trauma within the previous 3 months
   - Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
   - Bleeding or clotting problem or on blood thinners
   - CPR performed greater than 10 minutes
   - Currently Pregnant
   - Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.
3. Identify if the patient is currently in heart failure or cardiogenic shock. For these patients, a percutaneous coronary intervention is more effective.
   - Presence of pulmonary edema (rales greater than halfway up lung fields)
   - Systemic hypoperfusion (cool and clammy)
4. If any contraindication is noted using the check list and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligable patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.
5. Record all findings in the Patient Care Report (PCR).

**Certification Requirements:**

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Restraints: Physical

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

**Procedure:**

1. Attempt less restrictive means of managing the patient.
2. Request law enforcement assistance and **Contact Medical Control**.
3. Ensure that there are sufficient personnel available to physically restrain the patient safely.
4. Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other devices will be on top of the patient. The patient will never be restrained in the prone position.
5. The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This MUST be documented on the PCR.
7. Documentation on/with the patient care report (PCR) should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed. Use of the Restraint Checklist is highly recommended.
8. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. (Chemical restraint may be considered earlier.)
9. If a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel can not remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Spinal Immobilization

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Need for spinal immobilization as determined by protocol

**Procedure:**

1. Gather a backboard, straps, C-collar appropriate for patient's size, tape, and head rolls or similar device to secure the head.
2. Explain the procedure to the patient
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applied the collar.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself.)
5. Place the patient on a long spine board with the log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
7. NOTE: Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital. Special equipment such as football players in full pads and helmet may remain immobilized with helmet and pads in place.
8. Document the time of the procedure in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Splinting

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury.
- Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters

**Procedure:**

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
2. Remove all clothing from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:
    - Assess neurovascular function as in #1 above.
    - Place the ankle device over the ankle.
    - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis
    - Extend the distal end of the splint at least 6 inches beyond the foot.
    - Attach the ankle device to the traction crank.
    - Twist until moderate resistance is met.
    - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Stroke Screen: Cincinnati Stroke Scale

| MR | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Suspected Stroke Patient.

**Procedure:**

1. Assess and treat suspected stroke patients as per protocol.
2. The Cincinnati Stroke Score (CSS) form should be completed for all suspected stroke patients (see appendix D). There are three screening criteria items on the CSS form.
3. Screen the patient for the following criteria:
    a. Arm drift
    b. Facial droop
    c. Abnormal speech
4. The final criterion consists of performing a patient exam looking for facial droop (patient shows teeth or smile), unilateral arm weakness (patient closes eyes and extends both arms straight out, with palms up for 10 seconds), or abnormal speech (patient repeats “you can’t teach an old dog new tricks”). One of these exam components must be positive to answer “yes” on the screening form.
5. **If any of the CSS screening criteria are met (“Abnormal” on Checklist from Appendix D), follow the EMS System Stroke Plan and alert the receiving hospital of a possible stroke patient as early as possible.**
6. All sections of the CSS form must be completed.
7. The completed CSS form should be attached or documented in the PCR.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Temperature Measurement

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.

**Procedure:**

1. For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 3 to 5 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 6 to 8 below).
2. To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient's tongue with appropriate sterile covering.
3. Have the patient seal their mouth closed around thermometer.
4. If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the "beep" or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 9.
5. Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient's complaint.
6. To obtain a rectal temperature, cover the thermometer with an appropriate sterile cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
7. Follow guidelines in step 5 above to obtain temperature.
8. Record time, temperature, method (oral, rectal), and scale (C° or F°) in Patient Care Report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Urinary Catheterization

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- Monitoring a patient's fluid status and/or response to therapy during transport.
- Collection of urine for laboratory analysis.
- Patients with medical (but NOT TRAUMA) complaints over the age of 16.

**Procedure:**

1. Explain the procedure to the patient. Maximize patient privacy. Have a second crewmember or other chaperone if performing the procedure on a member of the opposite sex.
2. If there is any question of traumatic injury in the Genitourinary (GU) region, do not perform this procedure.
3. Open the catheter kit. Test the balloon at the catheter tip. Connect the catheter to the urine collection system. Maintain the sterility of contents.
4. Use sterile gloves from the kit. Use one hand to come in contact with the patient and the other to use items from the kit. Recall that once your hand touches the patient, it is no longer sterile and cannot be used to obtain items from the kit.
5. Using the Betadine swabs from the kit, thoroughly cleanse the area surrounding the urethra. For males, this will require retracting the foreskin for uncircumcised males and cleansing of the glans for all males. For females, this will require retraction of the labia majora and cleansing of the area around the urethra.
6. Once the patient has been prepped with Betadine, place sterile sheet(s).
7. Lubricate the tip of the catheter.
8. Gently guide the catheter through the external opening of the urethra. Advance the catheter slowly until there is return of urine. Do not force the catheter through resistance. If resistance is encountered, withdraw the catheter slightly and gently re-direct the catheter.
9. Once urine is returned, gently inflate the balloon and secure the urine collection device.
10. Record procedure and amount of urine returned in the Patient Care Report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Venous Access: Blood Draw

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Collection of a patient's blood for laboratory analysis

**Procedure:**

1. Utilize universal precautions as per OSHA.
2. Select vein and prep as usual.
3. Select appropriate blood-drawing devices.
4. Draw appropriate tubes of blood for lab testing.
5. Assure that the blood samples are labeled with the correct information (a minimum of the patients name, along with the date and time the sample was collected).
6. Deliver the blood tubes to the appropriate individual at the hospital.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Venous Access: Central Line Maintenance

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- Transport of a patient with a central venous pressure line already in place

**Procedure:**

1. Prior to transportation, ensure the line is secure.
2. Medications and IV fluids may be administered through a central venous pressure line. Such infusions must be held while the central venous pressure is transduced to obtain a central venous pressure, but may be restarted afterwards.
3. Do not manipulate the central venous catheter.
4. If the central venous catheter becomes dysfunctional, does not allow drug administration, or becomes dislodged, contact medical control.
5. Document the time of any pressure measurements, the pressure obtained, and any medication administration in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Venous Access: Existing Catheters

**Clinical Indications:**

P | EMT- P | P

- Inability to obtain adequate peripheral access.
- Access of an existing venous catheter for medication or fluid administration.
- Central venous access in a patient in cardiac arrest.

**Procedure:**

1. Clean the port of the catheter with alcohol wipe.
2. Using sterile technique, withdraw 5-10 ml of blood and discard syringe in sharps container.
3. Using 5cc of normal saline, access the port with sterile technique and gently attempt to flush the saline.
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 4. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.
5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
6. Record procedure, any complications, and fluids/medications administered in the Patient Care Report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Venous Access: External Jugular Access

| | | |
|---|---|---|
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

**Procedure:**

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Venous Access: Extremity

| I | EMT- I | I |
|---|---|---|
| P | EMT- P | P |

**Clinical Indications:**

- Any patient where intravenous access is indicated (significant trauma, emergent or potentially emergent medical condition).

**Procedure:**

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
2. Paramedics can use intraosseous access where threat to life exists as provided for in the Venous Access-Intraosseous procedure.
3. Use the largest catheter bore necessary based upon the patient's condition and size of veins.
4. Fluid and setup choice is preferably:
   - Lactated Ringers with a macro drip (10 gtt/cc) for burns
   - Normal Saline with a macro drip (10 gtt/cc) for medical conditions, trauma or hypotension
   - Normal Saline with a micro drip (60 gtt/cc) for medication infusions
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
7. Place a tourniquet around the patient's extremity to restrict venous flow only.
8. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
9. Prep the skin with an antiseptic solution.
10. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
11. Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
12. Draw blood samples when appropriate.
13. Remove the tourniquet and connect the IV tubing or saline lock.
14. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.

    **Rates are preferably:**
    - Adult: KVO: 60 cc/hr (1 gtt/ 6 sec for a macro drip set)
    - Pediatric: KVO: 30 cc/hr (1 gtt/ 12 sec for a macro drip set)

    **If shock is present:**
    - Adult: 500 cc fluid boluses repeated as long as lungs are dry and BP < 90. Consider a second IV line.
    - Pediatric: 20 cc/kg blouses repeated PRN for poor perfusion.
15. Cover the site with a sterile dressing and secure the IV and tubing.
16. Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.
17. Document the procedure, time and result (success) on/with the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Venous Access: Femoral Line – Page 1 of 2

| P | EMT- P | P |
|---|---|---|

**Clinical Indications:**

- Central venous access in a patient with an urgent need for fluid or medication administration.
- Inability to obtain adequate peripheral access.
- Patient aged greater than 16 years.
- No evidence of pelvic trauma.
- No evidence of trauma in the extremity in which the catheter is to be placed.

**Procedure:**

1. Obtain central access kit with 6.0 to 8.0 French cordis and equipment to place catheter by Selinger technique.
2. Completely expose the groin area on the side where the catheter is to be placed.
3. Palpate the femoral pulse in the inguinal crease. Recall that the inguinal ligament connects the pubic symphysis with the anterior, superior iliac spine and that all attempts at access should be made inferior to this ligament to avoid inadvertent entry into the abdominal cavity.
4. Once the femoral pulse has been palpated distal to the ilio-inguinal ligament, prep a large area of the skin with Betadine.
5. Use sterile gloves and place sterile drapes around the Betadine-prepped field.
6. With one hand, palpate the femoral pulse. The femoral vein will be located medially when compared with the femoral artery.
7. With the introducing needle from the kit, enter the skin over the anticipated position of the femoral vein. Gently aspirate as the needle is advanced. Angle the needle approximately 45 to 60 degrees in reference to the skin on the thigh.
8. Once non-pulsatile, venous blood is obtained, stop advancing the needle and hold the needle in position. Remove the syringe and observe the hub for pulsatile flow. If the blood appears arterial and/or is pulsatile, immediately remove the needle and apply direct pressure over the site. Once bleeding is controlled, return to step 7 above or consider the other extremity, if there are no contraindications.
9. If the needle appears to be in the femoral vein, insert the guide wire with sterile technique. Stop advancing the wire if there is any resistance; you may gently withdraw the wire and attempt re-insertion so long as sterility is maintained.
10. Stop advancing the wire in order to leave approximately 10 cm of the wire external to the hub of the needle.
11. **DO NOT LET GO OF THE WIRE.**
12. Holding the wire in the distal hand, remove the needle over the wire. Once the needle reaches the end of the wire, use the proximal hand to control the wire and the distal hand to remove the needle from the wire.
13. Use the scalpel to create a small incision in the skin at the base of the wire. Make certain the incision extends completely to the wire so there is no skin tag.

**CONTINUED VENOUS ACCESS: FEMORAL LINE - PAGE 2**

14. Place the catheter over the wire; use the wire a guide to place the catheter. Some
15. Gentle force may be required as the catheter enters the skin; this should not, however, require excessive force. Again, one hand should always maintain control of the wire.
16. Once the catheter is completely inserted, remove the wire.
17. Attach a syringe to the port of the catheter, release the clamp, and aspirate for blood. There should be an easy flow of venous blood.
18. Once all of the air has been removed from the catheter by aspirating blood, re-clamp the line.
19. Attach the desired IV fluid/blood/etc and begin infusion. **Note that "wide-open" lines will deliver large amounts of fluid quickly – monitor the patient's fluid status closely.**
20. Secure the catheter with sterile dressing or sutures.
21. Document procedure, complications, and clinical results in the patient care report (PCR)

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Venous Access: Intraosseous

| P | EMT- P | P |
|---|---|---|

**Clinical Indications:**

- Patients where rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.
- Burns.

**Contraindications:**

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta.
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

**Procedure:**

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12years of age, identify the anteriormedial aspect of the distal tibia (2 cm proximal to the medial malleolus). Proximal humerus is also an acceptable insertion site: for patients > 40 Kg, lateral aspect of the humerus, 2 cm distal to the greater tuberosity.
3. Prep the site recommended by the device manufacturer with providone-iodine ointment or solution.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further. Utilize the yellow needle for the proximal humerus. The pink needle is only intended for use in neonatal patients.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the surface and remove the injection device.
7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject at least 5 cc of NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. You may administer 10 to 20 mg (1 to 2 cc) of 1% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (6 cc).
12. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

# Venous Access: Swan-Ganz Catheter Maintenance

**Clinical Indications:**

P | EMT- P | P

- Transport of a patient with a Swan-Ganz catheter that is in place prior to transport.

**Procedure:**

1. Make certain catheter is secure prior to transport.
2. Under the supervision of the nurse or physician caring for the patient, make certain the transport personnel are aware of the depth at which the catheter is secured.
3. **UNDER NO CIRCUMSTANCES SHOULD TRANSPORT PERSONNEL ADVANCE THE SWAN-GANZ CATHETER.**
4. The sterile plastic sheath that surrounds the catheter should not be manipulated.
5. The ports of the catheter may be used to continue administration of medications or IV fluids that were initiated prior to transport. These should be used as any other IV port with attention to sterile technique.
6. If applicable, measurements from the catheter may be obtained during transport and used to guide care as per local protocols and medical control orders.
7. If at anytime during the transport difficulties with the function of the Swan-Ganz catheter is noted, contact medical control.
8. Document the time and any adjustments or problems associated with the catheter in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Wound Care-General

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Protection and care for open wounds prior to and during transport.

**Procedure:**

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.
6. Document the wound and assessment and care in the patient care report (PCR).

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Wound Care-Hemostatic Agent

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Serious hemorrhage that can not be controlled by other means.

**Contraindications:**

- Wounds involving open thoracic or abdominal cavities.

**Procedure:**

1. Apply approved non-heat-generating hemostatic agent per manufacturer's instructions.
2. Supplement with direct pressure and standard hemorrhage control techniques.
3. Apply dressing.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Wound Care-Taser® Probe Removal

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

**Contraindications:**

- Patients with conducted electrical weapon (Taser®) probe penetration in vulnerable areas of body as mentioned below should be transported for further evaluation and probe removal
- Probes embedded in skin above level of clavicles, female breasts, or genitalia
- Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.

**Procedure:**

- Ensure wires are disconnected from weapon.
- Stabilize skin around probe using non-dominant hand.
- Grasp probe by metal body with pliers or hemostats to prevent puncture wounds to EMS personnel.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Wound Care-Tourniquet

| | MR | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- Life threatening extremity hemorrhage that can not be controlled by other means.
- Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

**Contraindications:**

- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

**Procedure:**

1. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care protocol
6. If delayed or prolonged transport and tourniquet application time > 45 minutes: consider reattempting standard hemorrhage control techniques and removing tourniquet

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

# Bus Crash

**Clinical Indications:**

- Provide an organized system of treating victims of a bus crash.
- Assure all victims are properly assessed, triage, treated and transported in accordance to applicable standards and protocols.
- Provide good care to all victims.

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Procedure:**

1. Establish "Command", secure the scene and size it up for all possible hazards.
2. Give a brief report to the Pitt County 9-1-1 Communication Center describing the conditions of the incident along with a request for any additional required resources.
3. Resolve any immediate concerns of threats to life safety.
4. "Command" will notify the Vidant Medical Center Emergency Department once it is determined that there are more than five victims to be transported.
5. Triage, treat and transport all victims in accordance with standardized protocol(s).
6. Follow the "Patient Refusal of Transport" policy for all adult victims (> 18 years of age) that are refusing treatment and/or transportation.
7. Minors (< 18 years of age) that do not require treatment and/or transportation will require either a parent or legal guardian to accept medical responsibility and sign the refusal document.
8. A) In the event that a school/church designee is present and is willing to accept medical responsibility and guardianship for minors that are not being treated and/or transported, you may list the names and ages of all the minors in the "comments/narrative" section of the ambulance call report and allow the refusing official to sign just one refusal document on behalf of all the names listed in the ambulance call report.
   B) In the event a representative/principal will not sign or come to the scene, go to Item 9.
9. Contact via Pitt County 9-1-1 Communication Center, the Medical Director or his/her designee regarding transport or non-transport to the hospital.

Local Requirements:

*EMS agencies periodically review the indications and procedure with all EMS personnel.

# Nitronox® Administration

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- Useful for relief of pain and anxiety from extremity trauma, burns and acute MI. It is self-administered which prevents over dosage, since the sedated patient will no longer be able to hold the mask. Assure that the area is well ventilated so that bystanders and EMS personnel do not become intoxicated by the fumes.

**Clinical Contraindications:**

- Altered mental status; alcohol intoxication; head injury
- Abdominal or chest trauma
- Shock
- Pneumothorax or pulmonary disease such as COPD or asthma

**Procedure:**

1. Record the tank pressures on the Nitronox® unit as both tanks are opened.
2. The Nitronox® unit delivers a 50:50 mixture of nitrous oxide and oxygen to the demand valve.
3. Instruct the patient to hold the mask tightly to his/her face and breathe in the gas. You should hear the valve open with inhalation. Allow the patient to titrate himself/herself. DO NOT hold the mask for him/her.
4. Monitor vital signs closely.
5. Upon arrival at the hospital, close the nitrous oxide valve first. Have the patient continue inhaling to “clear the line”. Then close the oxygen valve and record the tank pressures.
6. Document the time, procedure and patient response on the patient report.

**Local Requirements:**

- **Note: This procedure skill is applicable to those Pitt County EMS Agencies that have access to Nitronox® on their EMS units.**
- Those Paramedic agencies utilizing Nitronox® should periodically review the indications, contraindications, technique and possible complications of the procedure with all of their paramedics.

# Rectal Administration

| | | |
|---|---|---|
| B | EMT | B |
| I | EMT- I | I |
| P | EMT- P | P |

**Clinical Indications:**

- When an IV cannot be placed, some medications are approved to be given rectally.
- Frequently used in infants and children who may not be able to swallow oral medications.
- Absorption of rectally administered drugs is generally somewhat slower than the oral route.

**EMT and EMT-I: (suppository administration only)**

**Procedure:**

1. The medication should be drawn up into a syringe after checking for appropriate medication, dose, expiration date, purity, and clarity. (If medication to be administered is a suppository, go to stop 9.)
2. For pediatrics, a 6 fr or 10 fr pediatric feeding tube should be attached to the syringe.
3. Cut the tubing so there is about 4 centimeters (1 ½ inches) of tubing from where it attaches to the syringe (this eliminates a lengthy tubing).
4. Lubricate the tubing end with water soluble lubricant (i.e. KY Jelly).
5. Insert the feeding tube approximately 2 centimeters into the rectum.
6. The medication may be administered (appropriate dose per route) followed by a 2 ml saline flush.
7. Often it is necessary to hold the buttocks together to help retain the medication in the patient. Sometimes elevating the hips slightly on a non-trauma victim will assist in retention of medication.
8. Reassess.
9. If medication to be rectally administered is a suppository, check for appropriate medication, dose, expiration date, purity, and clarity**.** Suppositories will liquefy down if placed in a warm, heated environment or held in the hand/fingertips very long. If the suppository supplied is double the quantity needed for administration, using a sterile technique, divide the suppository in half. Place the suppository dose to be administered up into the rectum. After insertion, it will be necessary to hold the buttocks together to help retain the medication in the patient. Sometimes elevating the hips slightly on a non-trauma victim will assist in retention of medication. Reassess.
10. Document the time, procedure, medication dose, any complications, and patient response on the patient care report.

**Local Requirements:**

- Review the indications and the procedure in the ongoing continuing education program.

# Intradermal Injection

**Clinical Indications:**

| P | EMT- P | P |
|---|---|---|

- When a PPD (Purified protein derivative) skin test is necessary to effectively identify early individually for prophylactic drug therapy (prevent active TB).
- EMS agencies typically require annual skin testing.

**Procedure:**

1. Perform according to protocol or receive and confirm medication order with Medical Control.
2. Wear appropriate universal BSI precautions, prepare equipment and medication (check for correct name of medication, dose, concentration, clarity, expiration date) expelling air from the tuberculin syringe ( 1 cc, 25 – to 27-gauge needle, 3/8 to one inch long). (If medication is in an ampule, use a filtered needle to draw out the medication, then switch to a regular needle for infection).
3. Explain the procedure to the patient and reconfirm patient allergies and ask whether a past positive skin testing history would nullify giving this patient a PPD test. The patient should be directed to contact the squad/agency's Infection Control officer and follow their Standard Operating Procedures.
4. Prepare site (about 2 inches below elbow crease on inner aspect of arm) by cleansing with alcohol. Allow site to dry completely.
5. Pull the patient's skin taunt with your non-dominant hand.
6. Insert needle, bevel up, just under the skin, at a 10 – 15 º angle.
7. Slowly inject the medication (PPD, 0.10 ml); look for a small wheal/bump to form as medication is deposited and collects in the intradermal tissue.
8. Withdraw the needle and dispose in the sharps container without recapping.
9. Do not rub, scratch, or massage the injection site (remain patient) as it promotes systemic absorption and nullifies the advantage of localized effect.
10. Monitor the patient for any possible side effects.
11. Document the medication, dose, route, time, and patient response on a patient report. This report should note the due date for reading the testing results and then the testing results.
12. The injection site must be reassessed in 48-72 hours to note negative or positive results. Any 5 mm induration or greater is positive for routine and immunosuppressed patients. The patient would need to follow-up with the agency's Infection Control Officer and their respective Standard Operating Procedures. The agency's Infection Control Officer should contact the Medical Director and the Pitt County Health Department should the patient have a positive skin test.

**Local Requirements:**

- Optional procedure for those EMS agencies choosing to maintain an early identification of TB exposure and drug prophylazis – key to preventing active TB in EMS professionals.
- Those EMS agencies choosing the PPD skin testing option must review the indications, contraindications, technique and possible complications of the procedure. Appropriate documentation records **must** be maintained for PPD skin testing.

**Pitt County Emergency Medical Services**
**Medical Yellow Alert Guidelines & EMS Trauma Concerning Injuries/Conditions**

***Remember, EMS DOES NOT activate Trauma or state trauma "color" activations.***

Date: ____/____/____ Time of Call: ____:____

EMS Agency: _____ EMS Professional: _____

Patient Name: _____ DOB/Age: _____

Chief Complaint:_____

Worst SET V/S: BP- ____/____ HR-____ RR-____ SATS-____% Best GCS-____

Current V/S: BP- ____/____ HR-____ RR-____ SATS-____%

INTERVENTIONS: IV- Y / N INTUBATED- Y / N O2- ____LPM NC / NRB- ____

***Medical Yellow Alert Guidelines (Please check ALL boxes that apply)***

- □ Airway Compromise
  - Includes basic or advanced airway attempts or placement
- □ Ongoing Bag Valve Mask ventilations
- □ Non-invasive ventilations (CPAP or BiPAP)
- □ Uncontrolled bleeding not otherwise covered by Trauma Team Activation
- □ Hypotension (SBP < 90 for adults) with symptoms
- □ Any potentially unstable cardiac rhythm
  - Includes Bradycardia (HR < 60), Tachycardia (HR > 150)
- □ CPR, defibrillation, or cardioversion prior to arrival
- □ Altered Mental Status (GCS < 10)
- □ Active Seizure

---

Date: ____/____/____ Time of Call: ____:____ Time of Injury: ____:____

EMS Agency: _____ EMS Professional: _____

Patient Name: _____ DOB/Age: _____

MOI: _____

Worst SET V/S: BP- ____/____ HR-____ RR-____ SATS-____%; Best GCS-____

Current V/S: BP- ____/____ HR-____ RR-____ SATS-____%

INJURIES/Co-MORBIDITIES: _____

INTERVENTIONS: 2 IV's- Y / N IMMOBILIZED- Y / N INTUBATED- Y / N
O2- ____LPM NC / NRB- ____

***Trauma Concerning Injuries/Conditions (Please check ALL boxes that apply)***

- □ Shock – Blood Pressure: < 90 at any time in adults; Infant (BP < 60); Toddler (BP < 75); School Age (BP < 85); and Adolescent (BP < 90)
- □ Respiratory Distress – respiratory rate: < 10 or > 29 at any time in adults; Infant (< 30 or > 60); Toddler (< 24 or > 40); School Age (< 13 or > 30); and Adolescent (< 12 or > 26)
- □ Airway Compromise and/or intubation
- □ Receiving blood to maintaining vital signs (Request 2 copies of MD orders and pt consent)
- □ Unresponsive – Glasgow Coma Score < 8 with mechanism attributed to trauma
- □ Gunshot/penetrating wound to head, torso, neck, or proximal extremities (including & above knee or elbow)
- □ Paralysis (Spinal cord injury-confirmed or suspected)
- □ Pulseless extremity (Vascular compromise or suspected)
- □ Amputation above the wrist or the ankle (proximal) – Call Trauma attending – May require other services
- □ Crush, Instability, or flail of chest
- □ Crush or unstable pelvis
- □ Two or more femur and /or humerus fractures (proximal long bone)
- □ Burns (meeting American Burn Association Transfer Criteria: partial thickness (2nd Degree) burn > 10% full thickness (3rd Degree) burn; electrical/lightning/chemical burn; inhalation injury; circumferential burns; burn co-morbidities or concomitant trauma; burns to face, feet, hands, genitalia, burns to patients < 5 or > 55 years of age)
- □ GCS 9 – 12 with traumatic mechanism
- □ Abdominal injury by CT scan
- □ Obvious significant injury (not CT findings) and significant mechanism: Falls > 20 feet, Pedestrian hit (thrown or run over), Motorcycle crash > 20mph with separation of rider and bike, Motor vehicle crash with: ejection, rollover, speed > 40mph, or a death at the scene.

# On-Scene Physician Form

This EMS service would like to thank you for your effort and assistance. Please be advised that the EMS Professionals are operating under strict protocols and guidelines established by their medical director and the State of North Carolina. As a licensed physician, you may assume medical care of the patient. In order to do so, you will need to:

1. Receive approval to assume the patient's medical care from the EMS Agencies Online Medical Control physician.
2. Show proper identification including current North Carolina Medical Board Registration/ Licensure.
3. Accompany the patient to the hospital.
4. Carry out any interventions that do not conform to the EMS Agencies Protocols. EMS personnel cannot perform any interventions or administer medications that are not included in their protocols.
5. Sign all orders on the EMS Patient Care Report.
6. Assume all medico-legal responsibility for all patient care activities until the patient's care is transferred to another physician at the destination hospital.
7. Complete the "Assumption of Medical Care" section of this form below.

## Assumption of Medical Care

I, _____, MD; License #: _____,
**(Please Print your Name Here)**

have assumed authority and responsibility for the medical care and patient management for

_____.
**(Insert Patient's Name Here)**

I understand that I must accompany the patient to the Emergency Department. I further understand that all EMS personnel must follow North Carolina EMS Rules and Regulations as well as local EMS System protocols.

_____, MD Date: _____/_____/_____Time: _____AM/PM
**(Physician Signature Here)**

_____, EMS _____ Witness
**(EMS Lead Crew Member Signature Here)** **(Witness Signature Here)**

# Apgar Score

**The Apgar score should be obtained and recorded initially and at 5 minutes with the birth of delivery of any infant.**

- Each of the 5 parameters should be scored and then totaled.
- The Minimum score is 0
- The Maximum score is 10

| Sign | 0 | 1 | 2 |
|---|---|---|---|
| Heart Rate | Absent | <100 min. | >100 min. |
| Respiratory Effort | Absent | Weak Cry | Strong Cry |
| Muscle Tone | Limp | Some Flexion | Good Flexion |
| Reflex Irritability (when feet stimulated) | No Response | Some Motion | Cry |
| Color | Blue; Pale | Body Pink Extremities Blue | Pink |

# Pitt County Emergency Medical Services
# Prehospital Stroke Screen

## Cincinnati Stroke Scale

**Interpretation: if any of these 3 signs is abnormal, the probability of a stroke is 72%**

**Arm Drift**

*The patient closes eyes and extends both arms straight out, with palms up for 10 seconds*

- Normal – both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful)
- **Abnormal – one arm does not move or one arm drifts downward**

**Facial Droop**

*The patient shows teeth or smile*

- Normal – both sides of the face move equally
- **Abnormal – one side of the face does not move as well as the other side**

**Abnormal Speech**

*The patient repeats "you can't teach an old dog new tricks"*

- Normal – patient uses correct words with no slurring
- **Abnormal – patient slurs words, uses the wrong words, or is unable to speak**

**Checklist: (mark appropriate presentation)**

Facial Droop: Normal: _____ Abnormal: _____

Arm Drift: Normal: _____ Abnormal: _____

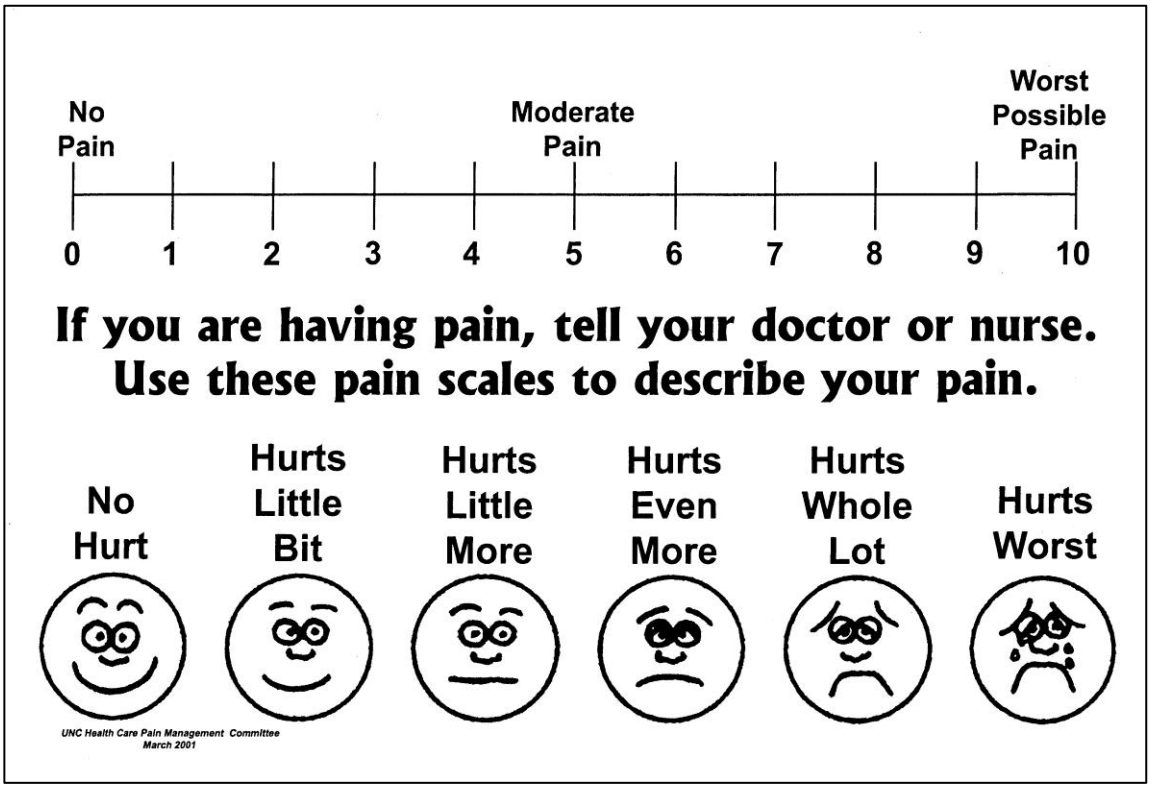
Speech: Normal: _____ Abnormal: _____

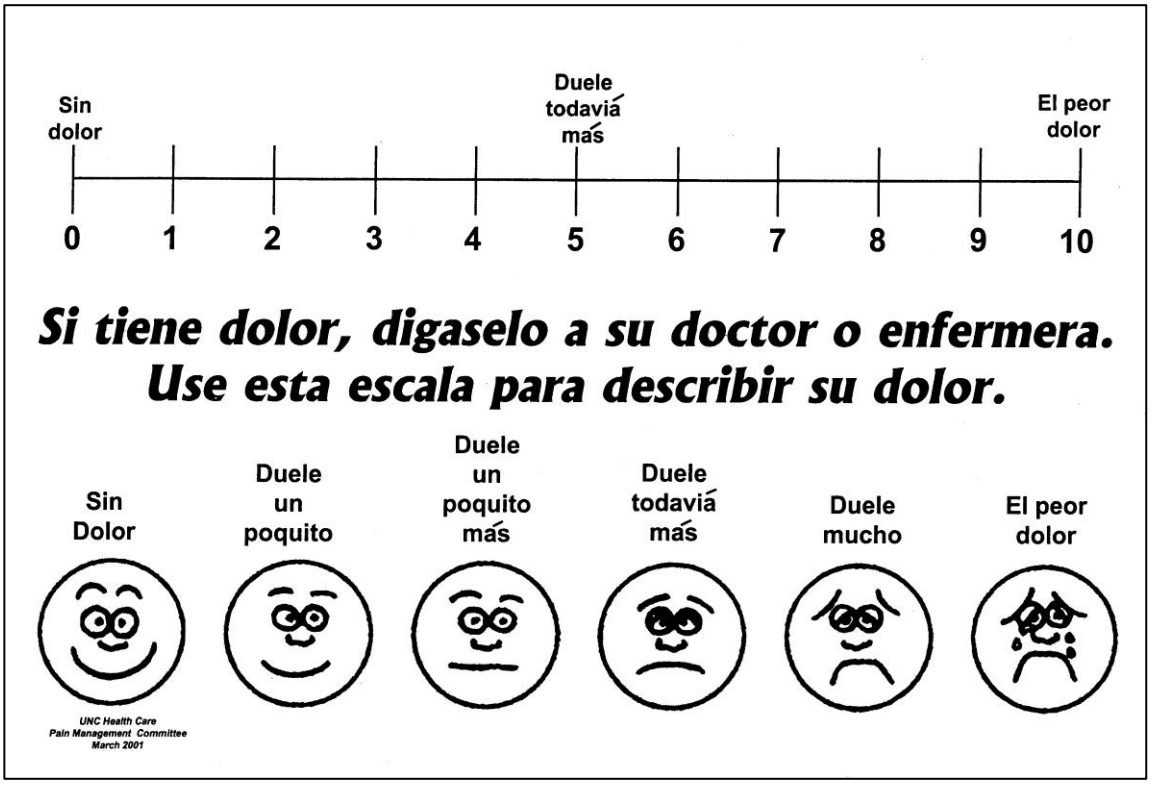
Patient name: _____

Date: _____ Time of Onset: _____

# Pain Scale Forms






From Hockenberry MJ, Wilson D, Winkelstein ML; Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

# Restraint Checklist

**Patient's Name:** _____

**PCR Number:**_____ **Date:** _____

**It is recommended that a Restraint Checklist be completed with any restraint use.**

**1. Reason for restraint (check all that apply):**

- ☐ Patient attempting to hurt self
- ☐ Patient attempting to hurt others
- ☐ Patient attempting to remove medically necessary devices

**2. Attempted verbal reassurance / redirection?**

- ☐ Yes
- ☐ No

**3. Attempted environmental modification? (i.e. remove patient from stressful environment)**

- ☐ Yes
- ☐ No

**4. Received medical control order for restraints?**

- ☐ Yes _____, MD
- ☐ No **(Medical Control Physician Name Here)**

**5. Time and Type of restraint applied (check all that apply):**

Date: _____/_____/_____Time: _____AM/PM

**Limb restraints:**

- ☐ LUE
- ☐ RUE
- ☐ LLE
- ☐ RLE

**Chemical Restraint:**

- ☐ Yes
- ☐ No

If Yes: Drug Used: _____

Total Dose: _____

**6. Vital signs and extremity neurovascular exam should be taken every 10 minutes.**

**7. Transport Position (Patient should NOT be in prone position)**

- ☐ Supine position for transport
- ☐ Lateral recumbent position for transport

Signature: _____

**(EMS Lead Crew Member)**

# Approved Medical Abbreviations

The following is a list of approved medical abbreviations. In general, the use of abbreviations should be limited to this list.

| | |
|---|---|
| A&O x 3 | - alert and oriented to person, place and time |
| A&O x 4 | - alert and oriented to person, place, time and event |
| A-FIB | - atrial fibrillation |
| AAA | - abdominal aortic aneurysm |
| ABC | - airway, breathing, circulation |
| ABD | - abdomen (abdominal) |
| ACLS | - advanced cardiac life support |
| AKA | - above the knee amputation |
| ALS | - advanced life support |
| AMA | - against medical advice |
| AMS | - altered mental status |
| AMT | - amount |
| APPROX | - approximately |
| ASA | - aspirin |
| ASSOC | - associated |
| BG | - blood glucose |
| BILAT | - bilateral |
| BKA | - below the knee amputation |
| BLS | - basic life support |
| BM | - bowel movement |
| BP | - blood pressure |
| BS | - breath sounds |
| BVM | - bag-valve-mask |
| C-SECTION | - caesarean section |
| C-SPINE | - cervical spine |
| C/O | - complaint of (complains of) |
| CA | - cancer |
| CABG | - coronary artery bypass graft |
| CAD | - coronary artery disease |
| CATH | - catheter |
| CC | - chief complaint |
| CEPH | - cephalic |
| CHF | - congestive heart failure |
| CNS | - central nervous system |
| COPD | - chronic obstructive pulmonary disease |
| CP | - chest pain |
| CPR | - cardiopulmonary resuscitation |
| CSF | - cerebrospinal fluid |
| CT | - cat scan |
| CVA | - cerebrovascular accident (stroke) |

| | |
|---|---|
| D5W | - 5% dextrose in water |
| DKA | - diabetic ketoacidosis |
| DNR | - do not resuscitate |
| DOA | - dead on arrival |
| DT | - delirium tremens |
| Dx | - diagnosis |
| | |
| ECG | - electrocardiogram |
| EEG | - electroencephelogram |
| ET | - endotracheal |
| ETOH | - ethanol (alcohol) |
| ETT | - endotracheal tube |
| EXT | - external (extension) |
| | |
| FB | - foreign body |
| FLEX | - flexion |
| Fx | - fracture |
| | |
| g | - gram(s) |
| GI | - gastrointestinal |
| GSW | - gunshot wound |
| gtts | - drops |
| GU | - gastrourinary |
| GYN | - gynecology (gynecological) |
| | |
| H/A | - headache |
| HEENT | - head, eyes, ears, nose, throat |
| HR | - heart rate (hour) |
| HTN | - hypertension |
| Hx | - history |
| | |
| ICP | - intracranial pressure |
| ICU | - intensive care unit |
| IM | - intramuscular |
| IV | - intravenous |
| | |
| JVD | - jugular vein distension |
| | |
| kg | - kilogram |
| KVO | - keep vein open |

# Approved Medical Abbreviations



| | |
|---|---|
| L-SPINE | - lumbar spine |
| L/S-SPINE | - lumbarsacral spine |
| L&D | - labor and delivery |
| LAT | - lateral |
| lb | - pound |
| LLQ | - left lower quadrant |
| LMP | - last mestrual period |
| LOC | - level of consciousness (loss of consciousness) |
| LR | - lactated ringers |
| LUQ | - left upper quadrant |
| | |
| MAST | - military anti-shock trousers |
| mcg | - microgram(s) |
| MED | - medicine |
| mg | - milligram(s) |
| MI | - myocardial infarction (heart attack) |
| min | - minimum / minute |
| MS | - mental status |
| MS | - mental status change |
| MSO4 | - morphine |
| MVC | - motor vehicle crash |
| | |
| N/V | - nausea/vomiting |
| N/V/D | - nausea/vomiting/diarrhea |
| NAD | - no apparant distress |
| NC | - nasal cannula |
| NEB | - nebulizer |
| NKDA | - no known drug allergies |
| NRB | - non-rebreather |
| NS | - normal saline |
| NSR | - normal sinus rhythm |
| | |
| OB/GYN | - obstetrics/gynecology |
| | |
| PALP | - palpation |
| PAC | - premature atrial contraction |
| PE | - pulmonary embolus |
| PEARL | - pupils equal and reactive to light |
| PMHx | - past medical history |
| PO | - orally |
| PRB | - partial rebreather |
| PRN | - as needed |
| PT | - patient |
| PVC | - premature ventricular contraction |

# Approved Medical Abbreviations



| | |
|---|---|
| RLQ | - right lower quadrant |
| RUQ | - right upper quadrant |
| Rx | - medicine |
| RXN | - reaction |
| | |
| S/P | - status post |
| SOB | - shortness of breath |
| SQ | - subcutaneous |
| ST | - sinus tachycardia |
| SVT | - supraventricular tachycardia |
| Sx | - symptom |
| SZ | - seizure |
| | |
| T-SPINE | - thoracic spine |
| T | - temperature |
| TIA | - transient ischemic attack |
| TKO | - to keep open (refers to IV's - same as KVO) |
| Tx | - treatment |
| | |
| UOA | - upon our arrival |
| URI | - upper respiratory infection |
| UTI | - urinary tract infection |
| | |
| VF | - ventricular fibrillation |
| VS | - vital signs |
| VT | - ventricular tachycardia |
| | |
| WAP | - wandering atrial pacemaker |
| WNL | - within normal limits |
| | |
| YO (YOA) | - years old (years of age) |
| | |
| M or ♂ | - male |
| F or ♀ | - female |
| + | - positive |
| - | - negative |
| ? | - questionable |
| | |
| Ψ | - psychiatric |
| ~ | - approximately |
| > | - greater than |
| < | - less than |
| = | - equal |

| | |
|---|---|
| $\overline{\uparrow}$ | - upper (increased) |
| $\overline{a}$ | - before |
| $\overline{p}$ | - after |
| $\overline{c}$ | - with |
| s | - without |
| | |
| $\Delta$ | - change |
| L | - left |
| R | - right |
| $\downarrow$ | - lower (decreased) |
| 1° | - primary |
| 2° | - secondary |

# Reperfusion Checklist

The Reperfusion Checklist is an important component in the initial evaluation, treatment, and transport of patients suffering from an acute ST-elevation myocardial infarction (STEMI) or acute Stroke. Both of these conditions can be successfully treated using fibrinolysis (thrombolytics) if the patient arrives at the appropriate hospital within the therapeutic window of time.

This form should be completed for all acute STEMI and acute Stroke patients.

Patient's Name: _____

PCR Number:_____ Date: _____

**1. Has the patient experienced chest discomfort for greater than 15 minutes and less than 12 hours?**

☐ Yes ☐ No

**2. Has the patient developed a sudden neurologic deficit with a positive Los Angeles Prehospital Stroke Screen?**

☐ Yes ☐ No

**3. Are there any contraindications to fibrinolysis?**

If any of the following are checked "Yes", fibrinolysis MAY be contraindicated.

☐ Yes ☐ No Systolic Blood Pressure greater than 180 mm Hg
☐ Yes ☐ No Diastolic Blood Pressure greater than 110 mm Hg
☐ Yes ☐ No Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
☐ Yes ☐ No History of structural Central Nervous System disease (tumors, masses, hemorrhage, etc.)
☐ Yes ☐ No Significant closed head or facial trauma within the previous 3 months
☐ Yes ☐ No Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
☐ Yes ☐ No Bleeding or clotting problem or on blood thinners
☐ Yes ☐ No CPR performed greater than 10 minutes
☐ Yes ☐ No Currently Pregnant
☐ Yes ☐ No Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.

**4. (STEMI Patients Only) Does the patient have severe heart failure or cardiogenic shock?**
These patients may benefit more from a percutaneous coronary intervention (PCI) capable hospital.

☐ Yes ☐ No Presence of pulmonary edema (rales greater than halfway up lung fields)
☐ Yes ☐ No Systemic hypoperfusion (cool and clammy)

**<u>If any contraindication is checked as "Yes" and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligible patients.</u> This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.**

# Difficult Airway Evaluation



## Evaluating for the difficult airway

Between 1 – 3% of patients who require endotracheal intubation have airways that make intubation difficult. Recognizing those patients who may have a difficult airway allows the paramedic to proceed with caution and to keep as many options open as possible. It also allows the paramedic to prepare additional equipment (such as a cricothyrotomy kit) that may not ordinarily be part of a standard airway kit. The pneumonic LEMON is useful in evaluating patients for signs that may be consistent with a difficult airway and should raise the paramedic's index of suspicion.

### **L**ook externally

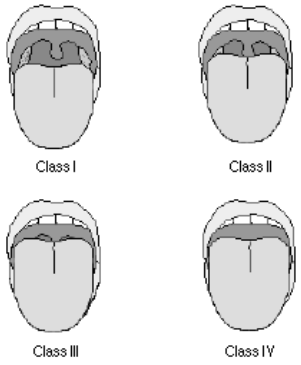
External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, extreme cachexia, edentulous mouth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.

### **E**valuate 3-3-2 Rule

3 fingers between the patient's teeth (patient's mouth should open adequately to permit three fingers to be placed between the upper and lower teeth)
3 fingers between the tip of the jaw and the beginning of the neck (under the chin)
2 fingers between the thyroid notch and the floor of the mandible (top of the neck)

### **M**allampati

This scoring system is based on the work of Mallampati et al published in the Canadian Anaesthesia Society Journal in 1985. The system takes into account the anatomy of the mouth and the view of various anatomical structures when the patient opens his mouth as wide as possible. This test is performed with the patient in the sitting position, the head held in a neutral position, the mouth wide open, and the tongue protruding to the maximum. Inappropriate scoring may occur if the patient is in the supine position (instead of sitting), if the patient phonates or if the patient arches his or her tongue.




Class I (easy) = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.
Class II = visualization of the soft palate, fauces and uvula.
Class III = visualization of the soft palate and the base of the uvula.
Class IV (difficult) = soft palate is not visible at all.

### **O**bstruction?

Besides the obvious difficulty if the airway is obstructed with a foreign body, the paramedic should also consider other obstructers such as tumor, abscess, epiglottis, or expanding hematoma.

### **N**eck Mobility

Ask the patient to place their chin on their chest and to tilt their head backward as far as possible. Obviously, this will not be possible in the immobilized trauma patient.

# Burns Resources

## Fluid Formula

### Formula for Fluid Resuscitation of the Burn Patient (Also known as the Parkland Formula)

**Pts Wt kg x %TBSA x 4.0cc LR infused over 24 hours with half given in the first 8 hours.**

**(For the equation, the abbreviations are: PW x TBSA x 4.0 cc )**

**EMS focuses on the care given during the 1st hour or several hours following the event. Thus the formula as adapted for EMS and the first 8 hours is:**

**PW x TBSA x 4.0 cc, divide by 2**

**to take this to the hourly rate, divide that solution by 8 and the equation becomes:**

**PW x TBSA x 4.0cc / 2 / 8 = total to be infused for each of the first 8 hours.**

**Another way to state the equation is to use:**
**PW x TBSA x 0.25cc = total to be infused for each hour of the first 8 hours.**

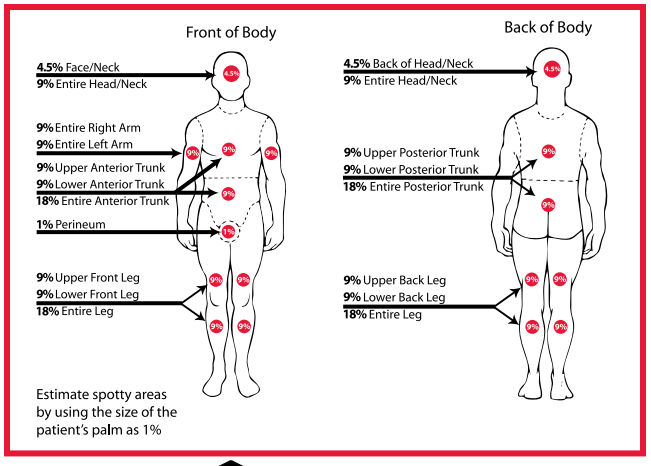
***Example, 80 kg patient with 50 %TBSA x 0.25 cc = 1000 cc/hr.***

**Remember:**
**Patient's Weight in kg (2.2 lbs = 1.0 kg) example: 220 lbs adult = 100 kg**

**% TSBA = Rule of Nine Total Body Surface Area**

**Factor for the 1st hr. and each hr. for the 1st 8 hrs. = 0.25**

**(Reminder, if two IV's are running, divide total amount to be infused each hr. by 2)**




| Wt (kg) | % TBSA | Factor | /Hr for 1st 8 Hrs of Care | 60 gtt set, gtt/ min | 20 gtt set, gtt/ min | 15 gtt set, gtt/ min | 10 gtt set, gtt/ min |
|---|---|---|---|---|---|---|---|
| 10 | 10 | 0.25 | 25 | 25 | 8.3 | 6.3 | 4.2 |
| 10 | 20 | 0.25 | 50 | 50 | 16.7 | 12.5 | 8.3 |
| 10 | 30 | 0.25 | 75 | 75 | 25.0 | 18.8 | 12.5 |
| 10 | 40 | 0.25 | 100 | 100 | 33.3 | 25.0 | 16.7 |
| 10 | 50 | 0.25 | 125 | 125 | 41.7 | 31.3 | 20.8 |
| 20 | 10 | 0.25 | 50 | 50 | 16.7 | 12.5 | 8.3 |
| 20 | 20 | 0.25 | 100 | 100 | 33.3 | 25.0 | 16.7 |
| 20 | 30 | 0.25 | 150 | 150 | 50.0 | 37.5 | 25.0 |
| 20 | 40 | 0.25 | 200 | 200 | 66.7 | 50.0 | 33.3 |
| 20 | 50 | 0.25 | 250 | 250 | 83.3 | 62.5 | 41.7 |
| 30 | 10 | 0.25 | 75 | 75 | 25.0 | 18.8 | 12.5 |
| 30 | 20 | 0.25 | 150 | 150 | 50.0 | 37.5 | 25.0 |
| 30 | 30 | 0.25 | 225 | 225 | 75.0 | 56.3 | 37.5 |
| 30 | 40 | 0.25 | 300 | 300 | 100.0 | 75.0 | 50.0 |
| 30 | 50 | 0.25 | 375 | 375 | 125.0 | 93.8 | 62.5 |
| 40 | 10 | 0.25 | 100 | 100 | 33.3 | 25.0 | 16.7 |
| 40 | 20 | 0.25 | 200 | 200 | 66.7 | 50.0 | 33.3 |
| 40 | 30 | 0.25 | 300 | 300 | 100.0 | 75.0 | 50.0 |
| 40 | 40 | 0.25 | 400 | 400 | 133.3 | 100.0 | 66.7 |
| 40 | 50 | 0.25 | 500 | 500 | 166.7 | 125.0 | 83.3 |
| 50 | 10 | 0.25 | 125 | 125 | 41.7 | 31.3 | 20.8 |
| 50 | 20 | 0.25 | 250 | 250 | 83.3 | 62.5 | 41.7 |
| 50 | 30 | 0.25 | 375 | 375 | 125.0 | 93.8 | 62.5 |
| 50 | 40 | 0.25 | 500 | 500 | 166.7 | 125.0 | 83.3 |
| 50 | 50 | 0.25 | 625 | 625 | 208.3 | 156.3 | 104.2 |
| 60 | 10 | 0.25 | 150 | 150 | 50.0 | 37.5 | 25.0 |
| 60 | 20 | 0.25 | 300 | 300 | 100.0 | 75.0 | 50.0 |
| 60 | 30 | 0.25 | 450 | 450 | 150.0 | 112.5 | 75.0 |
| 60 | 40 | 0.25 | 600 | 600 | 200.0 | 150.0 | 100.0 |
| 60 | 50 | 0.25 | 750 | 750 | 250.0 | 187.5 | 125.0 |
| 70 | 10 | 0.25 | 175 | 175 | 58.3 | 43.8 | 29.2 |
| 70 | 20 | 0.25 | 350 | 350 | 116.7 | 87.5 | 58.3 |
| 70 | 30 | 0.25 | 525 | 525 | 175.0 | 131.3 | 87.5 |
| 70 | 40 | 0.25 | 700 | 700 | 233.3 | 175.0 | 116.7 |
| 70 | 50 | 0.25 | 875 | 875 | 291.7 | 218.8 | 145.8 |
| 80 | 10 | 0.25 | 200 | 200 | 66.7 | 50.0 | 33.3 |
| 80 | 20 | 0.25 | 400 | 400 | 133.3 | 100.0 | 66.7 |
| 80 | 30 | 0.25 | 600 | 600 | 200.0 | 150.0 | 100.0 |
| 80 | 40 | 0.25 | 800 | 800 | 266.7 | 200.0 | 133.3 |
| 80 | 50 | 0.25 | 1000 | 1000 | 333.3 | 250.0 | 166.7 |
| 90 | 10 | 0.25 | 225 | 225 | 75.0 | 56.3 | 37.5 |
| 90 | 20 | 0.25 | 450 | 450 | 150.0 | 112.5 | 75.0 |
| 90 | 30 | 0.25 | 675 | 675 | 225.0 | 168.8 | 112.5 |
| 90 | 40 | 0.25 | 900 | 900 | 300.0 | 225.0 | 150.0 |
| 90 | 50 | 0.25 | 1125 | 1125 | 375.0 | 281.3 | 187.5 |
| 100 | 10 | 0.25 | 250 | 250 | 83.3 | 62.5 | 41.7 |
| 100 | 20 | 0.25 | 500 | 500 | 166.7 | 125.0 | 83.3 |
| 100 | 30 | 0.25 | 750 | 750 | 250.0 | 187.5 | 125.0 |
| 100 | 40 | 0.25 | 1000 | 1000 | 333.3 | 250.0 | 166.7 |
| 100 | 50 | 0.25 | 1250 | 1250 | 416.7 | 312.5 | 208.3 |

**Critical (Red)**

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonable accessible, transport to a Burn Center)

**Serious (Yellow)**

5-15% TBSA 2nd/3rd Degree Burn
Suspected Inhalation injury or requiring intubation for airway stabilization
Hypotension
GCS < 14
(When reasonable accessible, transport to either a Level I Burn Center or a Trauma Center)

**Minor (Green)**

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated, Normotensive
GCS>14
(Transport to the Local Hospital)

Run #:_____

**Pitt County Emergency Medical Services**
**Supplemental Report for Patient Refusal of Transport and/or Treatment**

Patient's Name: _____ Age: _____

**Complete the entire assessment below (if allowed). A check mark in any single shaded area requires contact with medical direction.**

| | | | |
|---|---|---|---|
| Patient's Age? | < 2 yoa | _____YES | _____NO |
| | 2– 17 yoa without parent/guardian at scene | _____YES | _____NO |
| | > 65 yoa | _____YES | _____NO |
| Pulse? | < 50 or > 120 | _____YES | _____NO |
| Systolic BP? | < 90 or > 200 | _____YES | _____NO |
| Diastolic BP? | > 120 | _____YES | _____NO |
| Respirations? | < 8 or > 24 | _____YES | _____NO |
| Chest Pain? | | _____YES | _____NO |
| S.O.B.? | | _____YES | _____NO |
| Hypoglycemic and on any oral hypoglycemic agent? | | _____YES | _____NO |
| Altered mental status and/or intoxication (alcohol or other drugs)? | | _____YES | _____NO |
| **NOT** alert and oriented? | | _____YES | _____NO |

**NOT** oriented to: **Person:** ___ **Place:** ___ **Time:** ___ **Situation:** ___

**Physician giving medical direction?** _____

---

**PATIENT REFUSAL**

**The EMT has recommended that either you or the patient (should you be the guardian):**

__ have your blood pressure and other vital signs measured. __ receive oxygen. __ receive an IV.
__ be placed on a backboard with a neck collar. __ receive a complete physical exam. __ be transported to the hospital by EMS.
__ receive medication: _____ __ Other: _____

**Universal Patient Instructions:**

1. You have not by evaluated by a doctor.
2. You have not received a complete medical evaluation. You should contact or see your doctor immediately.
3. If at any time after you have taken any medication, you have trouble breathing, start wheezing, get hives or a rash, or have any unexpected reaction, call "9-1-1" immediately.
4. If your symptoms worsen at any time, you should see your doctor; go to the hospital or call "9-1-1".

**Motor Vehicle Crash Instructions:**

1. Please contact your doctor if any one of the following signs or symptoms develop:

| | | | |
|---|---|---|---|
| Increased pain to any body area | Swelling, numbness or tingling | Drowsiness or increased irritability | Nausea or vomiting |
| Persistent or bad headache | Vision problems | Speech or hearing difficulty | Weakness |
| Loss of feeling in arms or legs | Difficulty walking | Twitching or convulsions | Confusion |
| Neck or back pain | Unequal pupils | Loss of consciousness | Loss of memory |
| Bleeding or discharge from the nose or ears | | | |

2. Awaken the patient every 2 hrs. for the next 12 hrs. to make sure he/she can be easily aroused and can answer simple questions.
3. Do not take any sedatives, alcohol or pain medications without first checking with your doctor. Check with your doctor if you are taking aspirin regularly.
4. Apply cold to any tender/painful area.
5. If the EMT has recommended, or you feel you should be evaluated for stitches, then you should seek medical attention as soon as possible and within 6 hrs. of the injury.
6. Clean any wounds and keep them clean. Wash with soap and water 2-3 times/day. Do not soak.
7. Apply a small amount of antibiotic ointment after washing. Do not apply any ointment if you will be seeking immediate medical attention.
8. Cover the wound with sterile gauze dressings. Adhesive bandages maintains moisture and increase the risk of infection.
9. Provided that you are not allergic, ibuprofen or acetaminophen may be taken as directed for pain or discomfort. Avoid taking aspirin. Check with your doctor if you are taking aspirin regularly.
10. Contact your doctor if it has been more than 5 years since your last tetanus shot or if you are uncertain. If required, the tetanus shot should be given within 24 hrs. of the injury.

**Low Blood Sugar Instructions:**

You have had a period of unconsciousness or altered level of consciousness that may have been caused by a low level of sugar and may be related to your diagnosed condition of diabetes. The EMT may have administered medication or sugar to improve your condition, but this improvement is often only temporary. It is important to have regular check-ups so that your doctor can help you control your blood sugar level, which can be controlled with medication and proper diet.

**Today your blood sugar was _____ before and _____ after you were given medications.**

You have decided not to be transported by ambulance to a medical facility following a probable low blood sugar episode. Please contact your doctor as soon as possible to notify him/her of this episode and if the frequency or severity of your low blood sugar level episodes increase.

1. Take your medicine exactly as prescribed and eat right away. The sugar/medicine you were given is short acting.
2. Wear a medic alert tag at all times.
3. Have a responsible person wake you every 2-hours for the next 12-hours.
4. Check your blood sugar again in 1-2 hours to make sure it is okay and then test your urine or blood sugar as directed.
5. If you feel like your blood sugar is getting low, test it and eat as directed.
6. Stay with a competent caregiver, and teach family members and others close by how to help when your blood sugar becomes too low.
7. Discuss with your doctor whether there should be any restrictions on your job or activities.

**I refuse the _____ TREATMENT and/or _____ TRANSPORTATION that the EMT has recommended.**

I understand that my refusal may result in serious injury or death to myself or the patient. I accept full responsibility for this decision. I assume all risks and consequences resulting from my refusal of care. I will not hold the EMS provider organization, nor its officers, agents, employees or physicians responsible for any outcomes that may occur to me or the patient. I acknowledge that I have had the opportunity to ask questions, if any, and that they have been answered. My signature below attests that I understand what has been recommended and what the consequences may be due to my refusal. **I have read or been read and understand the instruction(s) noted above. I knowingly still refuse to receive medical treatment and/or transportation that have been recommended by EMS.**

_____ _____ _____/_____/_____
Patient/Guardian Signature (Refused to sign _____) Guardian's Printed Name Date

_____/_____ _____
Witness Signature Witness' Printed Name EMT's Signature

Version: **Pitt County 2012 EMS Protocols Form revision March 15, 2013**

# North Carolina EMS Airway Evaluation Form

**The NC EMS Airway Evaluation Form is required to be completed with all patients receiving Rapid Sequence Induction in the Pre-hospital Environment.**

**FOR ORAL ROUTE:**
Each Insertion of Blade into Oropharynx = 1 Attempt

**FOR NASAL ROUTE:**
Pass of Tube Past the Nares = 1 Attempt

## 1. Patient Demographic Information

Date: ___/___/___ Dispatch Time: ___:___ am/pm

PCR # _____

EMS Agency Name:_____

Patient Age (yr): _____ Patient Sex: ❑ M ❑ F

## 2. Glasgow Coma Score (GCS) before intubation

| | | | | | |
|---|---|---|---|---|---|
| **Eye** | ❑ (1) | ❑ (2) | ❑ (3) | ❑ (4) | |
| **Verbal** | ❑ (1) | ❑ (2) | ❑ (3) | ❑ (4) | ❑ (5) |
| **Motor** | ❑ (1) | ❑ (2) | ❑ (3) | ❑ (4) | ❑ (5) ❑ (6) |

## 3. Was ETI successful for the overall encounter?

❑ Yes ❑ No ❑ Uncertain

## 4. Was intubation attempt due to Trauma?

❑ Yes ❑ No

## 5. Level of training of each rescuer assisting with intubation

| Rescuer A | Rescuer B | Rescuer C |
|---|---|---|
| **State ID:** | **State ID:** | **State ID:** |
| ❑ Paramedic | ❑ Paramedic | ❑ Paramedic |
| ❑ EMT-I | ❑ EMT-I | ❑ EMT-I |
| ❑ Medic Student | ❑ Medic Student | ❑ Medic Student |
| ❑ Nurse | ❑ Nurse | ❑ Nurse |
| ❑ Phys. Assist | ❑ Phys. Assist | ❑ Phys. Assist |
| ❑ MD/DO | ❑ MD/DO | ❑ MD/DO |
| ❑ Other: _____ | ❑ Other: _____ | ❑ Other: _____ |

## 6. Indicate drugs given to facilitate intubation

❑ Atropine _____ mg
❑ Etomidate _____ mg
❑ Lidocaine _____ mg
❑ Midazolam _____ mg
❑ Rocuronium _____ mg
❑ Succinylcholine _____ mg
❑ Vecuronium _____ mg
❑ Other–Specify _____–_____ mg
❑ Other–Specify _____–_____ mg

## 7. Times and Vital Signs

| | Time | Heart Rate | Resp. Rate | Blood Pressure | Pulse Oximetry | $ECTO_2$ |
|---|---|---|---|---|---|---|
| **Pre-Airway Assessment Values** | : | | | / | | |
| **Successful Airway Obtained** | : | | | | | |
| **Post-Airway Assessment Values** | : | | | / | | |

## 8. Provide information for each laryngoscopy attempt.

| Attempt | ETI Method | Rescuer | Attempt Successful? |
|---|---|---|---|
| 1 | ❑ Oral ❑ Nasal | ❑ A ❑ B ❑ C | ❑ Yes ❑ No |
| 2 | ❑ Oral ❑ Nasal | ❑ A ❑ B ❑ C | ❑ Yes ❑ No |
| 3 | ❑ Oral ❑ Nasal | ❑ A ❑ B ❑ C | ❑ Yes ❑ No |
| 4 | ❑ Oral ❑ Nasal | ❑ A ❑ B ❑ C | ❑ Yes ❑ No |

## 9. Who verified placement of ET Tube?

❑ Rescuer performing intubation
❑ Another rescuer on the same team
❑ Receiving helicopter/EMS crew
❑ Receiving hospital team
❑ Other: _____

## 10. Endotracheal tube confirmation

| | Auscultation | ETCO2 | Breath Sounds | Absent Epigastric |
|---|---|---|---|---|
| **Placement Confirmation** | ❑ | ❑ | ❑ | ❑ |
| **Tube Size** | | **Tube Depth** | | |
| **Security Method** | | | | |

## 11. If all intubation FAILED, indicate secondary airway technique used (Check *all* that apply)

❑ Bag-Valve-Mask (BVM) ❑ Combitube
❑ Open Cricothyroidotomy ❑ King LTD
❑ Other _____

## 12. Signature of Receiving Physician/Healthcare Provider (Confirming Destination/Transfer Tube Placement)

❑ Yes ❑ No ❑ Uncertain

**Date and Time:** _____ : _____ am/pm

## 13. Signature of EMS Medical Director (Confirming Review of Completed Form)

❑ Chart Review Done ❑ Remediation Required ❑ Approved

**Date:**

# STEMI
## EMS Triage and Destination Plan


### STEMI Patient
**(ST Elevation Myocardial Infarction)**

* **Cardiac symptoms greater than 15 minutes and less than 12 hours**

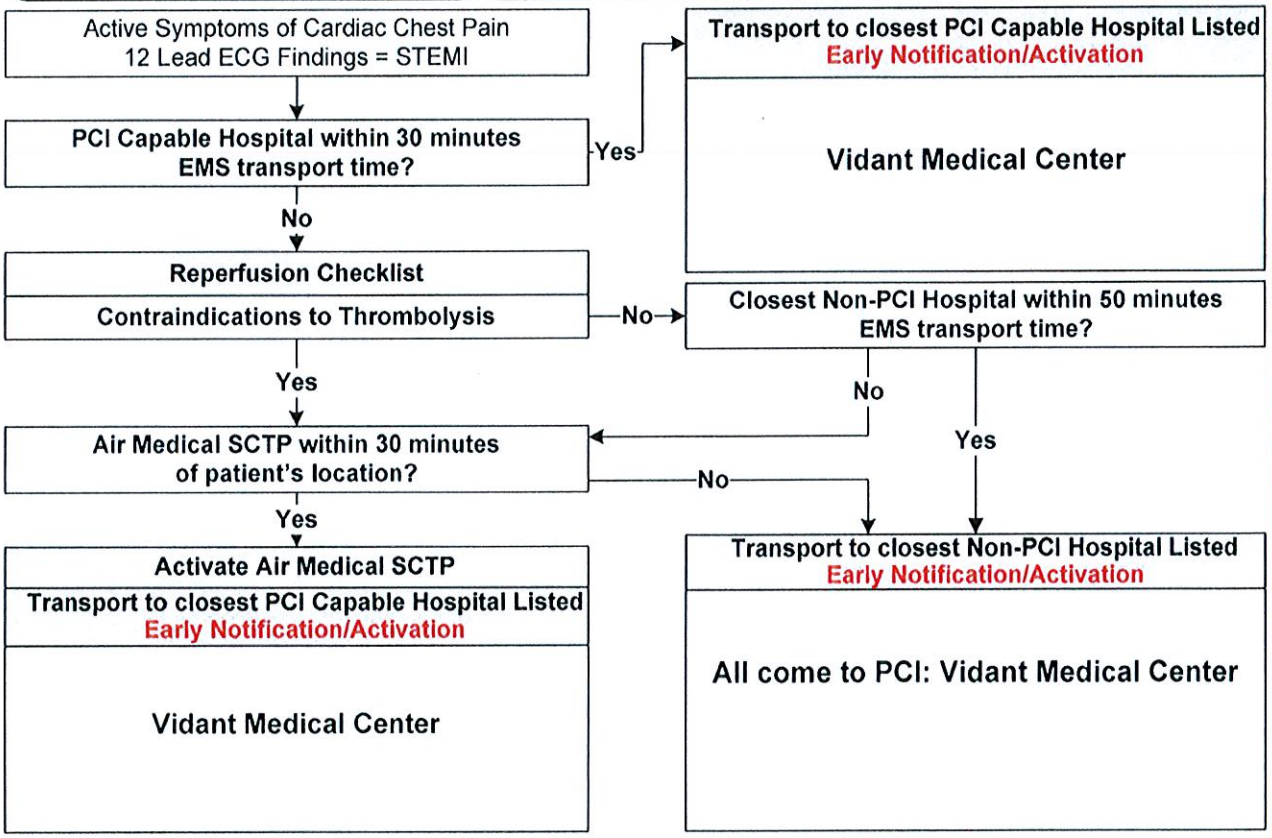
**And**

* **12 lead ECG criteria of 1 mm ST elevation in 2 or more contiguous leads**

**or**

* **Left Bundle Branch Block NOT KNOWN to be present in the past**

### The Purpose of this plan is to:
* Rapidly identify STEMI patients who call 911 or present to EMS
* Minimize the time from onset of STEMI symptoms to coronary reperfusion
* Quickly diagnose a STEMI by 12 lead ECG
* Complete a reperfusion checklist (unless being transported directly to a PCI hospital) to determine thrombolytic eligibility
* Rapidly identify the best hospital destination based on symptom onset time, reperfusion checklist, and predicted transport time
* Early activation/notification to the hospital prior to patient arrival
* Minimize scene time to 15 minutes or less (including a 12 lead ECG)
* Provide quality EMS service and patient care to the EMS Systems citizens
* Continuously evaluate the EMS System based on North Carolina's STEMI EMS performance measures




STEMI EMS Triage and Destination Plan

**Pearls and Definitions**

* **All STEMI Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
* **All Patient Care is based on the EMS Chest Pain and STEMI Protocol**
* **Consider implementing a prehospital thrombolytic program if a STEMI patient cannot reach a hospital within 90 minutes using air or ground EMS transport.**
* **PCI (Percutaneous Coronary Intervention) Capable Hospital** = a hospital with an emergency interventional cardiac catheterization laboratory capable of providing the following services to acute STEMI patients. Free standing emergency departments and satellite facilities are not considered part of the PCI Capable Hospital.
  * 24/7 PCI capability within 30 minutes of notification (interventional cardiologist present at the start of the case)
  * Single Call Activation number for use by EMS
  * Accepts all patients regardless of bed availability
  * Provides outcome and performance measure feedback to EMS including case review
* **Non-PCI Hospital** = a local hospital within the EMS System's service area which provides emergency care, including thrombolytic administration, to an acute STEMI patient but does NOT provide PCI services.
* **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute STEMI patient from EMS or a Non-PCI hospital and transport the patient to a PCI capable hospital.



This protocol has been developed by the North Carolina Office of EMS (Final Version 11-1-2009)

# Stroke
## EMS Triage and Destination Plan


### Stroke Patient

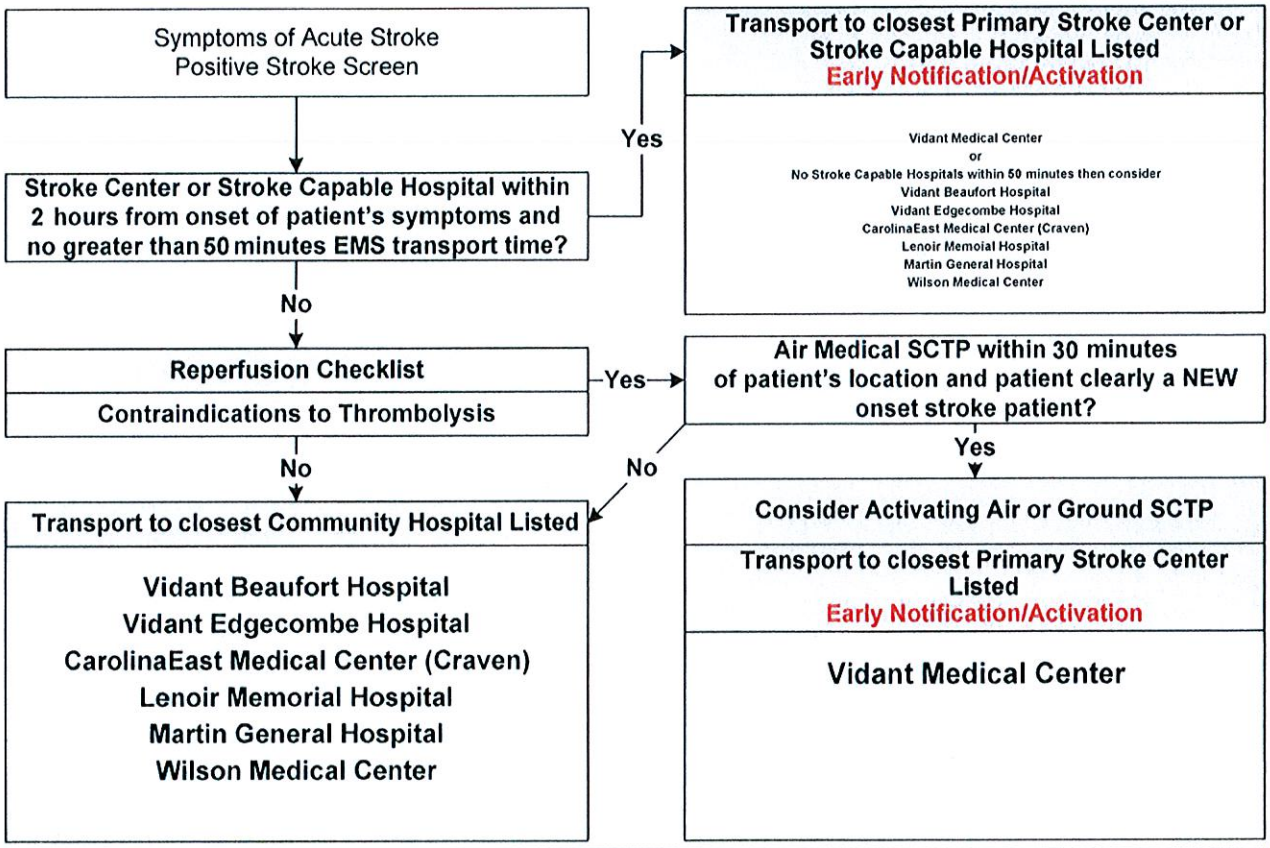
* **A patient with symptoms of an acute Stroke as identified by the EMS Stroke Screen**

### Time of Symptom Onset

* **Defined as the last witnessed time the patient was symptom free (i.e. the time of onset for a patient awakening with stroke symptoms would the last time he/she was known to be symptom free before the sleep period)**

### The Purpose of this plan is to:

* Rapidly identify acute Stroke patients who call 911 or present to EMS
* Minimize the time from onset of Stroke symptoms to definitive care
* Quickly diagnose a Stroke using validated EMS Stroke Screen
* Complete a reperfusion checklist (unless being transported directly to a Stroke Capable Hospital) to determine thrombolytic eligibility
* Rapidly identify the best hospital destination based on symptom onset time, reperfusion checklist, and predicted transport time
* Early activation/notification to the hospital prior to patient arrival
* Minimize scene time to 10 minutes or less
* Provide quality EMS service and patient care to the EMS Systems citizens
* Continuously evaluate the EMS System based on North Carolina's Stroke EMS performance measures




**Stroke EMS Triage and Destination Plan**

**Pearls and Definitions**

* **All Stroke Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
* **All Patient Care is based on the EMS Suspected Stroke Protocol**
* **Primary Stroke Center** = a hospital that is currently accredited by the Joint Commission as a Primary Stroke Center. Free standing emergency departments and satellite facilities are not considered part of the Primary Stroke Center.
* **Stroke Capable Hospital** = a hospital which provides emergency care with a commitment to Stroke and the following capabilities:
  * CT availability with in-house technician availability 24/7/365
  * Ability to rapidly evaluate an acute stroke patient to identify patients who would benefit from thrombolytic administration
  * Ability and willingness to administer thrombolytic agents to eligible acute Stroke patients
  * Accepts all patients regardless of bed availability
  * Provides outcome and performance measure feedback to EMS including case review
* **Community Hospital** = a local hospital within the EMS System's service area which provides emergency care but does not meet the criteria for a Primary Stroke Center or Stroke Capable Hospital
* **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute Stroke patient from EMS or a Hospital and transport the patient to a Primary Stroke Center.

# Trauma and Burn
## EMS Triage and Destination Plan


**Trauma or Burn Patient** = Any patient less (regardless of age) with a significant injury or burn

**The Purpose of this plan is to:**

* Rapidly identify injured or burned patients who call 911 or present to EMS
* Minimize the time from injury to definitive care for critical injuries or burns
* Quickly identify life or limb threatening injuries for EMS treatment and stabilization
* Rapidly identify the best hospital destination based on time of injury, severity of injury, and predicted transport time
* Early activation/notification to the hospital of a critically injured or burned patient prior to patient arrival
* Minimize scene time to 10 minutes or less from patient extrication with a "load and go" approach
* Provide quality EMS service and patient care to the EMS Systems citizens
* Continuously evaluate the EMS System based on North Carolina's EMS performance measures

**Acutely Injured or Burned Patient**

**Evidence of extreme shock or un-manageable airway** — Yes → **Transport to the Nearest Hospital for Stabilization Unless Minimal Additional Time to a Trauma Center**

No ↓

**Any Abnormal Vital Signs?**
* Glasgow Coma Score: <13 or intubated
* Systolic Blood Pressure: <90 mmHg
* Respiratory Rate: <10 or >29 breaths per min. (<20 in infant aged <1 year)

— Yes → **Trauma Center (Burn Center for isolated Burn Injury) within 60 minutes of EMS Transport?**

No ↓

No ↓

**Critical Injury by Assessment?**
* Penetrating injury to head, neck, torso, or extremities proximal to elbow and knee
* Flail Chest or Pneumothorax
* Two or more proximal long-bone fractures
* Crushed, degloved, or mangled extremity
* Amputation proximal to wrist and ankle
* Pelvic fractures
* Visibly Open or depressed skull fracture
* Paralysis
* Critical or Serious Burns (per EMS Burn Protocol)

— Yes → **Trauma Center (Burn Center for isolated Burn Injury) within 60 minutes of EMS Transport?**

— No → **Air Medical SCTP within 30 minutes of patient's location or helipad?**

Yes ↓

**Activate Air or Ground SCTP**

**Transport to closest Trauma Center (Burn Center for isolated Burn)**
* Choose a Level 3 Trauma Center if EMS transport time is less than 30 minutes compared to a Level 1 or 2 Trauma Center

**Early Notification/Activation**

**Vidant Medical Center**

No ↓

**Special Considerations?**
* Anticoagulation and bleeding disorders
* Pregnancy >20 weeks

— Yes → **Transport to closest Community Hospital Listed Unless Trauma Center can be reached in a near equal time**

**Early Notification/Activation**

No ↓

**Significant Mechanism?**
* Falls: Adults >20 ft, Children >10 ft.
* MVC: Intrusion >12 inches occupant side
  >18 inches any site
  Ejection
  Death in same vehicle
  Vehicle Telemetry with high risk injury
* Auto vs. pedestrian/bicyclist thrown, run over
* Motorcycle crash >20 mph

→ **Transport to closest Community Hospital Listed Unless Trauma Center can be reached in a near equal time**

**Vidant Beaufort Hospital**
**Vidant Edgecombe Hospital**
**CarolinaEast Medical Center (Craven)**
**Lenoir Memorial Hospital**
**Martin General Hospital**
**Wilson Medical Center**

**Trauma and Burn EMS Triage and Destination Plan**

**Pearls and Definitions**

* **All Injury and Burn Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
* **All Patient Care is based on the EMS Trauma Protocols**
* **Designated Trauma Center** = a hospital that is currently designated as a Trauma Center by the North Carolina Office of Emergency Medical Services. Trauma Centers are designated as Level 1, 2, or 3 with Level 1 being the highest possible designation. Free standing emergency departments and satellite facilities are not considered part of the Trauma Center.
* **Burn Center** = a ABA verified Burn Center co-located with a designated Trauma Center
* **Community Hospital** = a local hospital within the EMS System's service area which provides emergency care but has not been designated as a Trauma Center
* **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acutely injured patient from EMS or a Community Hospital and transport the patient to a designated Trauma Center.

# Pediatric
## EMS Triage and Destination Plan


### Pediatric Patient

* **Any patient less than 16 years of age with a life-threatening illness (Not Trauma)**

### Life Threatening Illness

* **Decreased Mental Status (GCS<13)**
* **Non-Responsive Respiratory Distress**
* **Intubation**
* **Post Cardiac Arrest**
* **Non-Responsive Hypotension (shock)**
* **Severe Hypothermia or Hyperthermia**
* **Status Epilepticus**
* **Potential Dangerous Envenomation**
* **Life Threatening Ingestion/Chemical Exposure**
* **Children with Special Healthcare Needs** (and destination choice based on parental request)

### The Purpose of this plan is to:

* Rapidly identify pediatric patients who call 911 or present to EMS with a life-threatening illness
* Minimize the time from EMS contact to definitive care
* Quickly diagnose patients with pediatric life-threatening illness for EMS treatment and stabilization
* Rapidly identify the best hospital destination based on symptom onset time, vital signs, response to treatment, and predicted transport time
* Early activation/notification to the hospital prior to patient arrival
* Minimize scene time with a "load and go" approach
* Provide quality EMS service and patient care to the EMS community
* Continuously evaluate the EMS System based on North Carolina's EMS performance measures

**Pediatric EMS Triage and Destination Plan**

Pediatric Patient with Life Threatening Illness (Not Trauma/Injury)

↓

**Pediatric Patient too unstable to transport beyond closest hospital?**

→ **Yes** → **Transport to closest Community Hospital Listed**
**Early Notification/Activation if Life Threatening**

**Consider:**
**Vidant Beaufort Hospital**
**Vidant Edgecombe Hospital**
**CarolinaEast Medical Center (Craven)**
**Lenoir Memorial Hospital**
**Martin General Hospital**
**Wilson Medical Center**

↓ **No**

**Pediatric Capable Hospital within a 50 minute EMS transport?**

→ **No** → **Transport to closest Community Hospital Listed**
**Early Notification/Activation if Life Threatening**

↓ **Yes**

**Transport to closest Pediatric Capable Hospital Listed**
**Early Notification/Activation**

**Vidant Medical Center**

**Pearls and Definitions**

* **All Pediatric Patients with a life-threatening illness must be triaged and transported using this plan. This plan is in effect 24/7/365.**
* **The Trauma and Burn Triage and Destination Plan should be used for all injured patients regardless of age.**
* **All Patient Care is based on the EMS Pediatric Protocol**
* **Pediatric Capable Hospital** = a hospital with an emergency and pediatric intensive care capability including but not limited to:
  * Emergency Department staffed 24 hours per day with board certified Emergency Physicians
  * An inpatient Pediatric Intensive Care Unit (with a physician pediatric intensivist available in-house or on call 24/7/365)
  * Accepts all EMS patients regardless of bed availability
  * Provides outcome and performance measure feedback to EMS including case review
* **Community Hospital** = a local hospital within the EMS System's service area which provides emergency care but does not meet the criteria of a Pediatric Capable Hospital
* **Pediatric Specialty Care Transport Program** = an air or ground based specialty care transport program that has specific pediatric training and equipment addressing the needs of a pediatric patient that can assume care of a pediatric patient from EMS or a Community Hospital and transport the patient to a Pediatric Capable Hospital.

# Dopamine Quick Reference

**Note Concentration**

## Dopamine (Intropin) 2 - 20 mcg/kg/min

**A mixture of 400 mg Dopamine in 250 ml = 1,600 mcg/ml**

| mcg/kg/ minute | Patient's Weight in Kilograms 2.5 | 5 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 mcg | - | - | 1 | 2 | 2 | 3 | 4 | 5 | 5 | 6 | 7 | 8 |
| 5 mcg | - | 1 | 2 | 4 | 6 | 8 | 9 | 11 | 13 | 15 | 17 | 19 |
| 10 mcg | 1 | 2 | 4 | 8 | 11 | 15 | 19 | 23 | 26 | 30 | 34 | 38 |
| 15 mcg | 1 | 3 | 6 | 11 | 17 | 23 | 28 | 34 | 39 | 45 | 51 | 56 |
| 20 mcg | 2 | 4 | 8 | 15 | 23 | 30 | 38 | 45 | 53 | 60 | 68 | 75 |

With a 60 drop per ml drip set this is the number of drops/minute (or ml/hr)

Observe for extravasation - swelling, pallor, pain, etc. at IV site.

# Prehospital Lactate Study

**Inclusion Criteria:**

SIRS Criteria

- Temp <36C or > 38C (<96.8F or > 100.4F)
- HR > 90/min
- RR > 20/min or $PaCO_2$ < 32
- SBP < 90

Suspected infection

- UTI, pneumonia, etc

**Exclusion Criteria:**

< 18 years of age

Pregnancy

Suspected intoxication

**Measure Lactate**

**< 2**

Routine EMS care

**2 – 4**

Start NS infusion

Notify RN upon arrival at ED

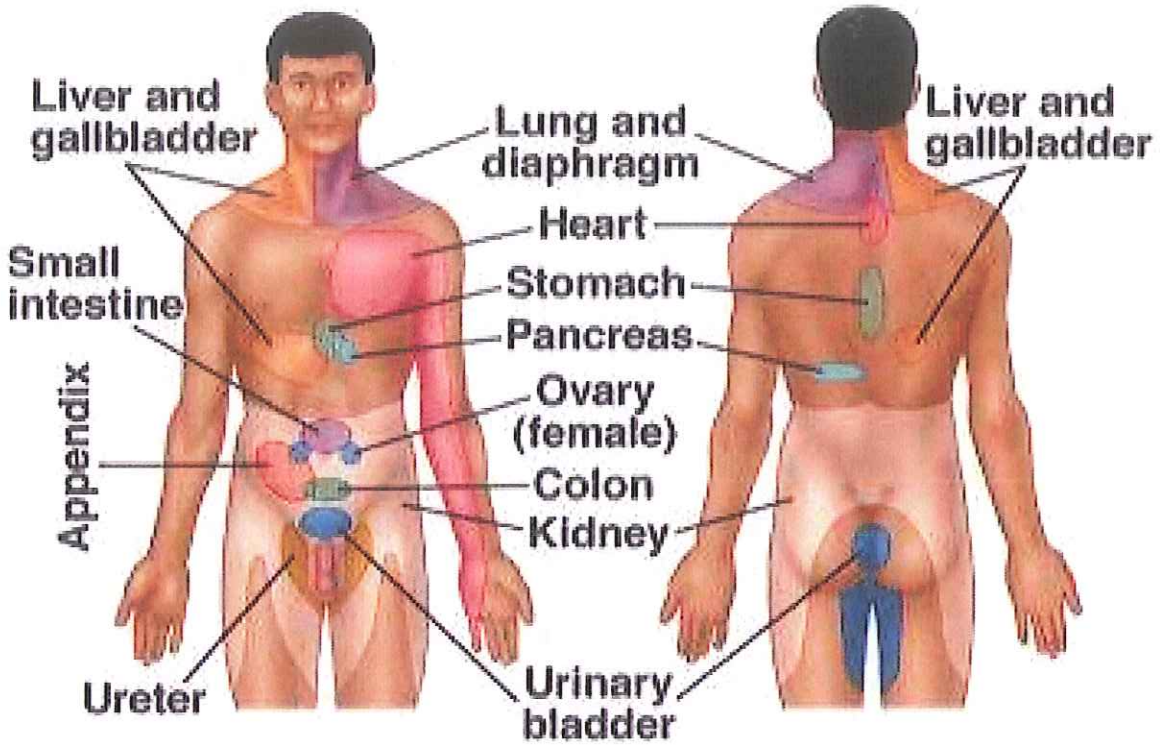
**> 4**

Start NS bolus

Call Medical Yellow

***Please be sure to fill out Lactate Study EMS Data Sheet and place in Drop Box.

Referred Pain Chart



# STEMI

**STEMI Criteria:**

1) "Good Story" Symptoms of ACS.
2) **STEMI** per monitor
3) Meets 4 steps to field diagnosis. "yes" to all steps A-D

**Four Steps to Field STEMI Diagnosis:**

A) ST elevation of 1-2 mm in 2 anatomically oriented leads?
B) Sum of the Q wave in V1 or V2 plus R wave of V5 or V6 is less than 35mm (7 LARGE boxes)?
C) QRS complex is less than 0.12 secs in width?
D) ST depression in at least one lead?

**Acute MI Locator ST↑elevation**

| Location | Leads | Recip. |
|---|---|---|
| **Inferior** (RCA) | II,III; F | I, AVL |
| **Septal** (LAD) | V1, V2 | |
| **Anterior** (LAD) | V3,V4 | II, III, F |
| **Lateral** (CIRC) | V5,V6, II, III, F I, L | |
| **Posterior** (RCA) | V8,V9 R>S in V1 | ST↓ V1 - 4 |
| **Right Vent.** (RCA) | V4R | |

| Axis | Lead I | Lead II | Lead III | Comments |
|---|---|---|---|---|
| Normal Axis 0 - 90 | | | | |
| Physiologic Left Axis 0 to -40 | | | | |
| Pathological Left Axis -40 to -90 | | | | Anterior Hemiblock |
| Right Axis 90 - 180 | | | | Posterior Hemiblock |
| Extreme Right Axis no man's land | | | | Ventricular in origin |

| Criteria for Left Ventricular Hypertrophy | |
|---|---|
| Rule of 35's deepest of lead V1 or lead V2 plus the tallest of leads V5 or V6. | **If > 35 mm and the patient is older than 35, Then LVH voltage met** |
| Lead aVL r wave is > 11mm tall | **Voltage Criteria for LVH present** |
| R wave > 20mm in any inferior lead | **II, III, or AVF** |
| R wave > 20mm in lead V6 | |
| R wave > 25mm in V5 | |
| S wave > 25mm in V1 or V2 | |

**Q**

q waves in lateral leads

**R**

r wave regression in v1-v4

**S**

s wave notching in v3-v5

**Algorithm for Determining Likelihood of MI in Patients with Chest Pain and LBBB**

| Question | Yes | No | Answer | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ST seg. elev. >= 1mm and is concordant with QRS axis | +5 | +0 | Y | Y | Y | Y | N | N | N | N |
| ST seg. depr. >= 1mm in V1, V2, or V3 | +3 | +0 | Y | Y | N | N | Y | Y | N | N |
| ST seg. elev. >= 5mm and is discordant with QRS axis | +2 | +0 | Y | N | Y | N | Y | N | Y | N |
| Score: | | | 10 | 8 | 7 | 5 | 5 | 3 | 2 | 0 |
| %MI: | | | 100 | 92 | 93 | 88 | 100 | 66 | 50 | 16 |
| Patients/Controls: | | | 4/0 | 22/2 | 26/2 | 43/6 | 1/0 | 6/3 | 9/9 | 20/109 |

# CHAPTER 7
# PREHOSPITAL VIDEO CASE SCENARIOS

This interactive session will allow you to view "patients" who have a major stroke syndrome or stroke mimic. Use the MEND checklist to evaluate these cases.

The image below summarizes the typical signs (deficits) of the five major stroke syndromes. On page 2 is a table of the typical signs observed on the CPSS (basic 3-step examination) for each of the 5 major stroke syndromes.

On page 3 are directions for the Video Case Scenario session and a summary of the pearls discussed during that session.

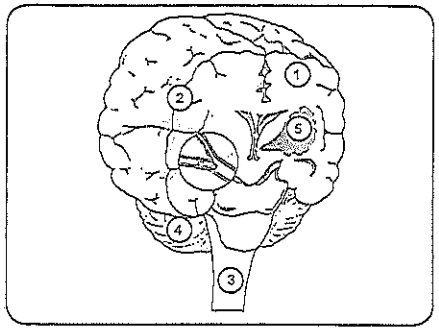
## MAJOR STROKE SYNDROME DEFICITS

**LEFT HEMISPHERE**
- Speech—aphasia
- R body—visual, motor, sensory

**RIGHT HEMISPHERE**
- L body—neglect, visual, motor, sensory

**BRAINSTEM**
- R and/or L motor, sensory
- Eye movements
- Speech/swallowing
- Dizziness/nausea
- ↓ Consciousness

**CEREBELLUM**
- Imbalance & dyscoordination




**5 POSSIBLE HEMORRHAGE**
- Headache
- Neck pain/stiffness
- Light intolerance
- Nausea/vomiting
- ↓ Consciousness
- ± Focal findings





## 5 MAJOR STROKE SYNDROMES:

## TYPICAL SIGNS FOR

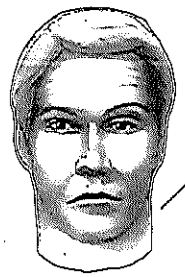
## CINCINNATI PREHOSPITAL STROKE SCALE

| CPSS ITEM | LEFT HEMISPHERE | RIGHT HEMISPHERE | BRAINSTEM | CEREBELLUM ☆ | HEMORRHAGE ○ |
|---|---|---|---|---|---|
| *SPEECH* | Aphasia—Wrong or inappropriate words | Says correctly | Dysarthria—slurring | Says correctly | Says correctly but slowly (often sleepy) |
| *FACIAL DROOP* | Right facial droop | Left facial droop | May have bilateral droop | No droop | No droop |
| *ARM DRIFT* | Right arm drift (weakness) | Left arm drift (weakness) | May have bilateral drift (weakness) | No drift | No drift |

☆ **Finger-to-nose and/or heel-to-shin testing typically abnormal**

○ **Decreased consciousness with headache and stiff neck are typical:**
- **without focal deficits, most consistent with subarachnoid hemorrhage;**
- **with focal deficits, most consistent with intracerebral hemorrage.**

You can't teach an old dog new tricks



Speech

Droop

Drift

*Figures © AHA 1997, reproduced with permission.*

| MEND EXAM—PREHOSPITAL "HEAD TO TOE" | | |
|---|---|---|
| **MENTAL STATUS** | ✓ IF ABNL | |
| Level of Consciousness (AVPU) | ❑ | |
| Speech "You can't teach an old dog new tricks." (repeat) Abnormal = wrong words, slurred speech, no speech | ❑ | |
| Questions (age, month) | ❑ | |
| Commands (close, open eyes) | ❑ | |
| **CRANIAL NERVES** | RT | LT |
| Facial Droop (show teeth or smile) Abnormal = one side does not move as well as other | ❑ | ❑ |
| Visual Fields (four quadrants) | ❑ | ❑ |
| Horizontal Gaze (side to side) | ❑ | ❑ |
| **LIMBS** | RT | LT |
| Motor—Arm Drift (close eyes and hold out both arms) Abnormal = arm can't move or drifts down | ❑ | ❑ |
| Motor—Leg Drift (open eyes and lift each leg separately) | ❑ | ❑ |
| Sensory—Arm and Leg (close eyes and touch, pinch) | ❑ | ❑ |
| Coordination—Arm and Leg (finger to nose, heel to shin) | ❑ | ❑ |

| MEND EXAM—HOSPITAL "HEAD TO TOE" | | |
|---|---|---|
| **MENTAL STATUS** | ✓ IF ABNL | |
| LOC | ❑ | |
| Speech | ❑ | |
| Questions | ❑ | |
| Commands | ❑ | |
| **CRANIAL NERVES** | RT | LT |
| Facial Droop | ❑ | ❑ |
| Visual Fields | ❑ | ❑ |
| Horizontal Gaze | ❑ | ❑ |
| **LIMBS** | RT | LT |
| Motor—Arm Drift | ❑ | ❑ |
| Motor—Leg Drift | ❑ | ❑ |
| Sensory—Arm | ❑ | ❑ |
| Sensory—Leg | ❑ | ❑ |
| Coordination—Arm | ❑ | ❑ |
| Coordination—Leg | ❑ | ❑ |

**YOUR DIAGNOSIS:** *(check the major stroke syndrome)*

❑ Hemorrhage ❑ Right Hemisphere ❑ Brainstem
❑ Left Hemisphere ❑ Cerebellum ❑ Not a stroke syndrome

**THE EXAMINATION WAS:**

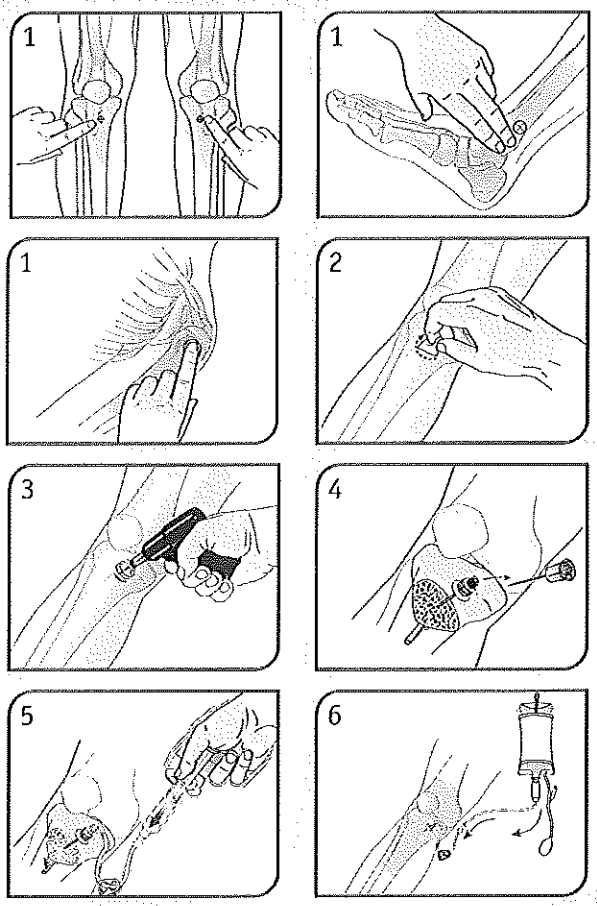
❑ Carried Out by Student ❑ Observed & Graded by Student

EZ-IO® by vidacare

Intraosseous Infusion System

Immediate Vascular Access... When You Need It.SM

# Intraosseous Infusion System



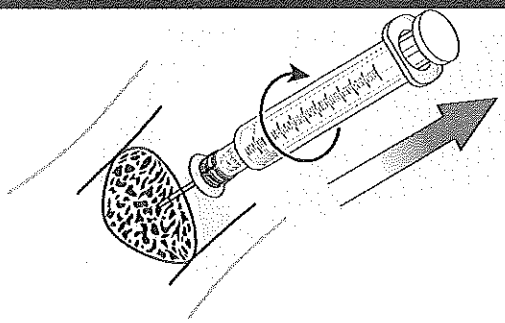

## To Insert Needle Set:

- Locate landmarks ..... 1
- Clean site ..... 2
- Insert EZ-IO® Needle Set ..... 3
- Remove stylet from catheter ..... 4
- Attach primed EZ-Connect®
- Consider IO 2% lidocaine without preservatives or epinephrine (cardiac lidocaine) for patients responsive to pain – prior to flush

  ***Follow institutional protocols/policy***
- Medications intended to remain in the medullary space, such as a local anesthetic, must be administered very slowly until the desired anesthetic effect is achieved
- Syringe bolus (flush) IO with 10 ml normal saline..... 5
- Start infusion under pressure ..... 6

**A Medical Director or qualified prescriber must authorize appropriate dosage range.**

## Do Not Leave the EZ-IO catheter in for more than 24 hours.



## To Remove Catheter:

- Stabilize patient's extremity
- Connect sterile Luer lock syringe to hub of catheter
- Rotate catheter clockwise – while pulling straight back
- When catheter has been removed, immediately place in appropriate biohazard container.

**DO NOT ROCK** the catheter while removing. Rocking or bending the catheter may cause the catheter to separate from the hub.

## Emergency contact in US or Canada call: 1-800-680-4911

For international assistance contact your local Vidacare Distributor

American Heart Association® | AMERICAN ASSOCIATION of CRITICAL-CARE NURSES

# PALS

## Vital Signs in Children

**Heart Rate (per minute)**

| Age | Awake Rate | Sleeping Rate |
|---|---|---|
| Newborn to 3 months | 85 to 205 | 80 to 160 |
| 3 months to 2 years | 100 to 190 | 75 to 160 |
| 2 to 10 years | 60 to 140 | 60 to 90 |
| >10 years | 60 to 100 | 50 to 90 |

**Respiratory Rate (breaths/min)***

| Age | Rate |
|---|---|
| Infant | 30 to 60 |
| Toddler | 24 to 40 |
| Preschooler | 22 to 34 |
| School-aged child | 18 to 30 |
| Adolescent | 12 to 16 |

## Definition of Hypotension by Systolic Blood Pressure and Age

| Age | Systolic Blood Pressure (mm Hg) |
|---|---|
| Term neonates (0 to 28 days) | <60 |
| Infants (1 to 12 months) | <70 |
| Children 1 to 10 years (5th BP percentile) | <70 + (age in years × 2) |
| Children >10 years | <90 |

## Modified Glasgow Coma Scale for Infants and Children†

| | Child | Infant | Score |
|---|---|---|---|
| Eye opening | Spontaneous | Spontaneous | 4 |
| | To speech | To speech | 3 |
| | To pain | To pain | 2 |
| | None | None | 1 |
| Best verbal response | Oriented, appropriate | Coos and babbles | 5 |
| | Confused | Irritable, cries | 4 |
| | Inappropriate words | Cries in response to pain | 3 |
| | Incomprehensible sounds | Moans in response to pain | 2 |
| | None | None | 1 |
| Best motor response‡ | Obeys commands | Moves spontaneously and purposely | 6 |
| | Localizes painful stimulus | Withdraws in response to touch | 5 |
| | Withdraws in response to pain | Withdraws in response to pain | 4 |
| | Flexion in response to pain | Abnormal flexion posture to pain | 3 |
| | Extension in response to pain | Abnormal extension posture to pain | 2 |
| | None | None | 1 |

*Reproduced from Hazinski MF. Children are different. In: *Manual of Pediatric Critical Care*. 1999:1-13. From Hazinski MF. Children are different. In: *Nursing Care of the Critically Ill Child*. 2nd ed. 1992:1-17. Both © Elsevier.
†Modified from Davis RJ et al. Head and spinal cord injury. In: Rogers MC, ed. *Textbook of Pediatric Intensive Care*. 1987:649-699, © Lippincott Williams & Wilkins; James HE, Trauner DA. The Glasgow Coma Scale. In: James HE et al, eds. *Brain Insults in Infants and Children*. 1985:179-182; and Hazinski MF. Neurologic disorders. In: *Nursing Care of the Critically Ill Child*. 2nd ed. 1992:521-628, © Elsevier.
‡If the patient is intubated, unconscious, or preverbal, the most important part of this scale is motor response. Providers should carefully evaluate this component.

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PUPIL GAUGE


TRAUMA CENTER
*University Health Systems of Eastern Carolina*

**1-800-672-7828**

## REVISED TRAUMA SCORE (RTS)

The RTS estimates severity of injury and projects survival based on the Glasgow Coma Scale and measures of cardiopulmonary function.

| | | | SCORE |
|---|---|---|---|
| **RESPIRATORY RATE** | 10-29/min | 4 | |
| | >29/min | 3 | |
| | 6-9/min | 2 | |
| | 1-5/min | 1 | |
| | 0 | 0 | ____ |
| **SYSTOLIC BLOOD PRESSURE** | >89 | 4 | |
| | 76-89 | 3 | |
| | 50-75 | 2 | |
| | 1-49 | 1 | |
| | 0 | 0 | ____ |

### GLASGOW COMA SCALE (GCS)

| | | | |
|---|---|---|---|
| **Eye Opening** | Spontaneous | 4 | |
| | To Voice | 3 | |
| | To Pain | 2 | |
| | None | 1 | |
| **Verbal Response** | Oriented | 5 | |
| | Confused | 4 | |
| | Inappropriate Words | 3 | |
| | Incomprehensible Words | 2 | |
| | None | 1 | |
| **Motor Response** | Obeys Command | 6 | |
| | Localizes Pain | 5 | |
| | Withdraw (pain) | 4 | |
| | Flexion (pain) | 3 | |
| | Extension (pain) | 2 | |
| | None | 1 | ____ |

**Convert GCS**
13-15 = 4
9-12 = 3
6-8 = 2
4-5 = 1
3 = 0

**Revised Trauma Score ( 0 - 12 ) =** ____

### Projected Estimate of Survival

| Trauma Score | Percentage Survival |
|---|---|
| 12 | 99.5 |
| 11 | 96.9 |
| 10 | 87.9 |
| 9 | 76.6 |
| 8 | 66.7 |
| 7 | 63.6 |
| 6 | 63.0 |
| 5 | 45.5 |
| 4 | 33.3 |
| 3 | 33.3 |
| 2 | 28.6 |
| 1 | 25.0 |
| 0 | 3.7 |

# North Carolina Medical Board
# Approved Medications for Credentialed EMS Personnel

**EMS personnel at any level who administer medications must do so within an EMS system that provides medical oversight. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies must be reviewed and approved by the Medical Director of the Office of EMS.**

| Medications | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| ACE inhibitors | | | | X |
| Acetaminophen | X | X | X | X |
| Adenosine | | | | X |
| Aminophylline | | | | X |
| Amiodarone | | | | X |
| Antibiotics | | | | X |
| Anti-emetic preparations | | | | X |
| Aspirin | | X | X | X |
| Atropine | X[4] | X[4] | X[4] | X |
| Barbituates | | | | X |
| Benzodiazepine preparations | | | | X |
| Beta agonist preparations | | X[2] | X | X |
| Beta blockers | | | | X |
| Bretylium | | | | X |
| Calcium channel blockers | | | | X |
| Calcium chloride/gluconate | | | | X |
| Charcoal | | X | X | X |
| Clonidine | | | | X |
| Clopidogrel | | | | X |
| Crystalloid solutions | | | X | X |
| Cyanide poisoning antidote kit | | | | X |
| Digoxin | | | | X |
| Diphenhydramine | | X[3] | X | X |
| Dobutamine | | | | X |
| Dopamine | | | | X |
| Epinephrine | X[1] | X[1] | X | X |
| Etomidate | | | | X |
| Flumazenil | | | | X |
| Furosemide | | | | X |
| Glucagon | | | X | X |
| Glucose solutions | | | X | X |
| Haloperidol | | | | X |
| Heparin (unfractionated and low molecular weight) | | | X | X |
| Histamine 2 blockers | | | X | X |
| Hydroxocobalamin | | | | X |
| Immunizations | | | X[6] | X[6] |
| Insulin | | | | X |
| Ipratropium | | | X | X |
| Isoproterenol | | | | X |
| Ketamine | | | | X[8] |
| Lidocaine | | | | X |
| Magnesium sulfate | | | | X |
| Mannitol | | | | X |

| Medications | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| Methylene blue | | | | X |
| Milrinone | | | | X |
| N-acetylcysteine | | | | X |
| Narcotic analgesics | | | | X |
| Narcotic antagonists | | X[7] | X | X |
| Nasal spray decongestant | | X | X | X |
| Nesiritide | | | | X |
| Nitroglycerin | | X[2] | X | X |
| Nitroprusside sodium | | | | X |
| Nitrous oxide | | | | X |
| Non-prescription medications | | X | X | X |
| Non-steroidal anti-inflammatory | | X | X | X |
| Norepinephrine | | | | X |
| Octreotide | | | | X |
| Oxygen | X[5] | X[5] | X[5] | X[5] |
| Oxytocin | | | | X |
| Paralytic agents | | | | X |
| Phenothiazine preparations | | | | X |
| Phenylephrine | | | | X |
| Phenytoin preparations | | | | X |
| Plasma protein fraction | | | | X |
| Platelet g-II/IIIa inhibitors | | | | X |
| Potassium chloride | | | | X |
| Pralidoxime | X[4] | X[4] | X[4] | X |
| Procainamide | | | | X |
| Procaine | | | | X |
| Proparacaine | | | | X |
| Propofol | | | | X[9] |
| Proton pump inhibitors | | | | X |
| Sodium bicarbonate | | | | X |
| Steroid preparations | | | | X |
| Thiamine | | | X | X |
| Thrombolytic agents | | | | X |
| Topical hemostatic agents | X | X | X | X |
| Total Parenteral Nutrition | | | | X |
| Tuberculosis skin test | | | X[6] | X[6] |
| Valprocic acid | | | | X |
| Vasopressin | | | X | X |
| Whole blood and components | | | | X |
| Ziprasidone | | | | X |

[1] MR and EMT use of epinephrine is limited to the treatment anaphylaxis and may be administered only by auto injector.

[2] EMT use of beta-agonists and nitroglycerine is limited to patients who currently are prescribed the medication. EMTs may administer these medications from EMS supplies. EMT use of beta-agonists may be through any inhaled method of medication administration.

[3] EMT administration of diphenhydramine is limited to the oral route.

[4] As a component of preparedness for domestic terrorism, EMS personnel, public safety officers, and other first responders recognized by the EMS system, may carry, self-administer, or administer to a patient atropine and/or pralidoxime, based on written protocols and medical direction. All personnel except for EMT-Ps must administer these medications by an auto injector.

[5] Administration of oxygen does not require medical direction.

[6] Administration of immunizations and TB skin tests are not limited to public health initiatives.

[7] EMT administration of naloxone is limited to the intra-nasal route.

[8] Can only be used as induction agent for RSI or for post intubation sedation.

[9] Can only be used for interfacility transport where infusion has already been started at transferring facility. **EMS units can not carry propofol, it must be provided by transferring hospital.**

# North Carolina Medical Board
# Approved Skills for Credentialed EMS Personnel

**EMS personnel performing these skills must do so within an EMS system. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies must be reviewed and approved by the Medical Director of the Office of EMS.**

| Skills | EMD | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|---|
| 12-Lead ECG acquisition & transmission | | | X | X | X |
| 12-Lead ECG interpretation | | | | | X |
| Airway-Blind Insertion Device | | | X[2] | X | X |
| Airway-CPAP | | | | X | X |
| Airway-Cricothyrotomy-Needle | | | | | X |
| Airway-Cricothyrotomy-Surgical | | | | | X |
| Airway-Intubation | | | | X | X |
| Airway-Rapid sequence induction | | | | | X |
| Airway-Suction | | X | X | X | X |
| Airway-Tracheostomy tube change | | | | X | X |
| Arterial Access-Blood Draw | | | | | X |
| Arterial Line maintenance | | | | | X |
| Capnography (waveform) | | | | | X |
| Carbon Monoxide Measurement (non-invasive) | | X | X | X | X |
| Cardiac Pacing | | | | | X |
| Cardiopulmonary Resuscitation | | X | X | X | X |
| Cardioversion | | | | | X |
| Carotid Massage | | | | | X |
| Central Venous Pressure line maintenance | | | | | X |
| Chest Compression-External Device | | | | X | X |
| Chest Decompression-Needle | | | | | X |
| Chest Tube Maintenance | | | | | X |
| Defibrillation-Automated | | X | X | X | X |
| Defibrillation-Manual | | | | | X |
| Epidural Catheter maintenance | | | | | X |
| Gastric Intubation | | | | | X |
| Glucose Measurement | | X | X | X | X |
| Intra-Ventricular Catheter maintenance | | | | | X |
| Intubation Confirmation-Capnometry (color) | | | | X | X |
| Intubation Confirmation-Esophageal Bulb | | | | X | X |
| Medication Administration | | X[3] | X[3] | X[3] | X[3] |
| Orthostatic Blood Pressure | | X | X | X | X |
| Oxygen Administration | | X | X | X | X |
| Patient Assessment | | X | X | X | X |
| Pulse Oximetry | | X | X | X | X |
| Reperfusion Checklist | | X | X | X | X |
| Respirator Operation | | | X | X | X |
| Restraints | | X | X | X | X |
| Spinal Immobilization | | X | X | X | X |
| Splinting | | X | X | X | X |
| Stroke Screen | | X | X | X | X |
| Swan-Ganz Catheter maintenance | | | | | X |
| Thermometer (oral & rectal with low temperature capability) | | X | X | X | X |

| Skills | EMD | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|---|
| Urinary Catheterization | | | | | X |
| Venous Access-Blood Draw | | | | X | X |
| Venous Access-Existing catheters | | | | | X |
| Venous Access-Femoral Line | | | | | X |
| Venous Access-Intraosseous | | | | | X |
| Venous Access-Peripheral | | | | X | X |
| Ventilator Operation | | | | | X |
| Wound Care | | X | X | X | X |
| Pre-arrival instructions to callers | X[1] | | | | |
| Determine and dispatch appropriate EMS system resources | X[1] | | | | |

[1] All EMD skills must be performed in EMS systems with medical oversight and written EMD protocols.

[2] EMTs using blind insertion airway devices must be functioning in EMS systems with medical direction and written treatment protocols.

[3] EMS personnel at any level who administer medications must do so within an EMS system that provides medical oversight. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies must be reviewed and approved by the Medical Director of the Office of EMS. The approved medication list is found at the beginning of this document. The administration of oxygen does not require medical direction.

**Pitt County EMS System**

# Minimum Required Drug List for EMT-Basic

**FORMULARY:**

| Quantity | Description |
|---|---|
| 1 | Acetaminophen (Tylenol), 650 mg (suppository) |
| 2 | Acetaminophen (Tylenol), 120 mg (suppository) |
| 2 | Acetaminophen (Tylenol), 325 mg tablets |
| 2 | ****Albuterol solution for inhalation, 2.5 mg |
| 6 | Aspirin, 81 mg/tablets (Baby ASA) |
| 2 | ***Diphenhydramine (Benadryl), 25 mg tablets |
| 1 | **EpiPen (Epinephrine 1:1000) Auto-injector, 0.3 mg |
| 1 | **EpiPen Jr (Epinephrine 1:1000) Auto-injector, 0.15 mg |
| 1 | Glucose, oral tube |
| 4 | Ibuprofen (Motrin), 200 mg (tablets) |
| 1 | *****Naloxone, 2 mg |
| 1 | *****Naloxone, 0.4 mg/ml |
| 1 | *Nitroglycerin sublingual tablet bottle, 1/150 grain (0.4 mg) |
| 1 | Oxymetazoline (Afrin), 0.05% nasal spray |

**PEARL:**

***EMT-B may administer Nitroglycerin to patients already prescribed medication.** May give from EMS supply.
****MR/EMT –B may administer Epinephrine IM as auto-injector only** and may administer from EMS supply.
Epinephrine in EMT systems may be used in Anaphylaxis only.
*****EMT-B may administer diphenhydramine by oral route only** and may administer from EMS supply.
******EMT-B may administer Albuterol if patient already prescribed** and may administer from EMS supply.
*******EMT-B may administer Naloxone by intra-nasal (IN) route only.** May administer from EMS supply.

**NOTE: Agency medical director does not require contact of Medical Control prior to administration of the bulleted medications.**

**NOTE: Substitutions for medications as listed may become necessary due to lack of medication availability. These substitutions should match medication type and total dose wherever possible. Substitutions require prior authorization by the Office of the Medical Director.**

This replaces any previously published list.

April 1, 2013 _____

Jeffrey D. Ferguson, MD, System Medical Director

**Pitt County EMS System**

# Minimum Required Drug List for EMT-Intermediate

**FORMULARY:**

| Quantity | Description |
|---|---|
| 1 | Acetaminophen (Tylenol), 650 mg (suppository) |
| 2 | Acetaminophen (Tylenol), 120 mg (suppository) |
| 6 | Acetaminophen (Tylenol), 325 mg (tablets) |
| 3 | Albuterol solution for inhalation, 2.5 mg |
| 6 | Aspirin, 81 mg/tablets |
| 3 | Dextrose 50% in water, 50 ml |
| 1 | Dextrose 10% in water, 500 ml bag |
| 2 | Diphenhydramine (Benadryl), 50 mg (injectable) |
| 2 | Diphenhydramine (Benadryl), 25 mg (tablets) |
| 2 | Epinephrine (1:1,000), 1 mg/ml (may substitute anaphylaxis kit for one) |
| 3 | Epinephrine (1:10,000), 1 ml/10ml |
| 1 | Famotidine, 20 mg (injectable) |
| 1 | Glucagon, 1mg |
| 1 | Glucose, oral tube |
| 4 | Ibuprofen (Motrin), 200 mg (tablets) |
| 1 | Dextrose 5% in water, 250 ml |
| 4 | Normal Saline, 1000 ml |
| 2 | Lactated Ringers, 1000 ml |
| 2 | Ipratropium (Atrovent), 2.5 ml |
| 2 | Ketorolac (Toradol), 30 mg |
| 3 | Naloxone, 2 mg |
| 1 | Naloxone, 0.4 mg/ml |
| 3 | Nitroglycerin paste and applicators |
| 2 | Nitroglycerin sublingual tablet bottles, 1/150 gr (0.4 mg) |
| 1 | Oxymetazoline (Afrin), 0.05% nasal spray |
| 3 | Saline, sterile 10 ml vial (injectable) |
| 3 | Water, sterile 10 ml vial (injectable) |

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This replaces any previously published list.

April 1, 2013 _____

Jeffrey D. Ferguson, MD, System Medical Director

# Minimum Required Medications List for Paramedics

**FORMULARY:**

| Quantity | Description |
|---|---|
| 1 | Acetaminophen (Tylenol), 650 mg (suppository) |
| 2 | Acetaminophen (Tylenol), 120 mg (suppository) |
| 6 | Acetaminophen (Tylenol), 325 mg (tablets) |
| 3 | Adenosine, 6 mg or 12 mg (30 mg total) |
| 3 | Albuterol solution for inhalation, 2.5 mg |
| 6 | Aspirin, 81 mg/tablets |
| 3 | Atropine, 1 mg |
| 1 | Calcium chloride, 1gm |
| 3 | Cordarone (Amiodarone), 150 mg |
| 1 | Dextrose 10% in water, 500 ml bag |
| 3 | Dextrose 50% in water, 50 ml |
| 2 | Diazepam (Valium), 10 mg |
| 1 | Diltiazem (Cardizem), 25 mg |
| 2 | Diphenhydramine (Benadryl), 50 mg (injectable) |
| 2 | Diphenhydramine (Benadryl), 25 mg (tablet) |
| 1 | Dopamine, 400 mg |
| 2 | Epinephrine (1:1,000), 1 mg/ml (may substitute anaphylaxis kit for one) |
| 6 | Epinephrine (1:10,000) 1 ml/10ml |
| 1 | Famotidine, 20 mg (injectable) |
| 2 | Fentanyl citrate (Sublimaze), 50 mcg |
| 6 | Furosemide (Lasix), 20 mg |
| 1 | Glucagon, 1 mg |
| 2 | Haloperidol (Haldol), 5 mg |
| 2 | Ibuprofen (Motrin), 400 mg (tablets) |
| 1 | Normal saline, 500 ml |
| 1 | Dextrose 5% in water, 500 ml |
| 4 | Normal saline, 1000 ml |
| 4 | Lactated Ringers, 1000 ml |
| 2 | Ipratropium (Atrovent), 2.5 ml |
| 2 | Ketorolac (Toradol), 30 mg |
| 1 | Labetalol, 20 mg |
| 1 | 1% Lidocaine, preservative-free, without Epinephrine, 20 mg/ml |
| 1 | 2% Lidocaine jelly |
| 3 | Lidocaine, 100 mg |
| 2 | Magnesium sulfate, 2 gram |
| 2 | Methylpredinsolone (Solu-Medrol), 125 mg |
| 1 | Midazolam (Versed), 5 mg |
| 2 | Morphine sulfate, 10 mg |

This replaces any previously published list.

April 1, 2013 _____

# Minimum Required Medications List for Paramedics

**FORMULARY:**

| Quantity | Description |
|---|---|
| 3 | Naloxone, 2 mg |
| 1 | Naloxone, 0.4 mg/ml |
| 3 | Nitroglycerin paste with applicators |
| 2 | Nitroglycerin sublingual tablet bottles, 1/150 gr (0.4 mg) |
| 1 | Nitrous oxide/oxygen delivery device (Nitronox) with demand valve and mask (optional) |
| 2 | Ondansetron (Zofran®), 4 mg |
| 1 | Oxymetazoline (Afrin), 0.05% nasal spray |
| 1 | Promethazine hydrochloride, 25 mg |
| 6 | Saline, sterile 10 ml (injectable) |
| 2 | Sodium bicarbonate, 50 mEq |
| 6 | Water, sterile 10 ml (injectable) |

**NOTE: Substitutions for medications as listed may become necessary due to lack of medication availability. These substitutions should match medication type and total dose wherever possible. Substitutions require prior authorization by the Office of the Medical Director.**

This replaces any previously published list.

April 1, 2013 _____
Jeffrey D. Ferguson, MD, System Medical Director

# Non-Transporting Quick Response Vehicle (QRV) Medication List
# Pitt County EMS System

## (Paramedic) Formulary:

| Quantity | Description |
|---|---|
| 1 | Acetaminophen (Tylenol), 650 mg (suppository) |
| 2 | Acetaminophen (Tylenol), 120 mg (suppository) |
| 6 | Acetaminophen (Tylenol), 325 mg (tablets) |
| 3 | Adenosine, 6 mg or 12 mg (30 mg total) |
| 3 | Albuterol solution for inhalation, 2.5 mg |
| 6 | Aspirin, 81 mg tablets |
| 3 | Atropine, 1 mg |
| 1 | Calcium Chloride, 1 gram |
| 3 | Cordarone (Amiodarone), 150 mg |
| | Dextrose 10% in water, 5 ml bag |
| 3 | Dextrose 50% in water, 50 ml |
| 2 | Diazepam (Valium), 10 mg |
| 1 | Diltiazem (Cardizem), 25 mg |
| 2 | Diphenhydramine (Benadryl), 50 mg (injectable) |
| 2 | Diphenhydramine (Benadryl) , 25 mg tablets |
| 1 | Dopamine, 400 mg |
| 2 | Epinephrine (1:1,000), 1 mg/ml (may substitute anaphylaxis kit for one) |
| 6 | Epinephrine (1:10,000), 1 ml/10 ml |
| 2 | Fentanyl Citrate (Sublimaze), 50 mcg |
| 6 | Furosemide (Lasix), 20 mg |
| 1 | Glucagon, 1mg |
| 2 | Haloperidol (Haldol), 5 mg |
| 4 | Ibuprofen (Motrin), 200 mg (tablets) |
| 1 | Normal saline, 500 ml |
| 1 | Dextrose 5% in water, 500 ml |
| 4 | Normal saline, 1000 ml |
| 4 | Lactated Ringers, 1000 ml |
| 2 | Ipratropium (Atrovent) 2.5 ml |
| 2 | Ketorolac (Toradol), 30 mg |
| 1 | Labetalol, 20 mg |
| 2 | 1% Lidocaine, preservative-free, without Epinephrine, 20 mg/ml |
| 1 | 2% Lidocaine jelly |
| 3 | Lidocaine, 100 mg |
| 2 | Magnesium sulfate, 2 gram |
| 2 | Methylpredinsolone (Solu-Medrol), 125 mg |
| 1 | Midazolam (Versed), 5 mg |
| 2 | Morphine sulfate, 10 mg |
| 3 | Naloxone, 2 mg |
| 1 | Naloxone, 0.4 mg/ml |
| 3 | Nitroglycerin paste with applicators |
| 2 | Nitroglycerin sublingual tablet bottles, 1/150 gr (0.4 mg) |
| 2 | Ondansetron (Zofran®), 4 mg |
| 1 | Oxymetazoline (Afrin), 0.05% nasal spray |
| 1 | Promethazine hydrochloride, 25 mg |
| 6 | Saline, sterile 10 ml (injectable) |
| 2 | Sodium bicarbonate, 50 mEq |
| 6 | Water, sterile 10 ml (injectable) |

**NOTE: Substitutions for medications as listed may become necessary due to lack of medication availability. These substitutions should match medication type and total dose wherever possible. Substitutions require prior authorization by the Office of the Medical Director.**

This replaces any previously published list.

April 1, 2013 _____

Jeffrey D. Ferguson, MD, System Medical Director

# Drug List

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Acetaminophen (Tylenol)**<br><br>**NCCEP Protocol:**<br>* 7-Pain Control-Adult<br>* 46-Pain Control-Pediatric<br>* 72-Fever<br><br>**Indications/Contraindications:**<br>• Indicated for pain and fever control<br>• Avoid in patients with severe liver disease | • (1-2) 325 mg po or suppository pr | • **See Color Coded List**<br>• 15 mg/kg po<br>• Age 2-5 yrs, 120 mg<br>• suppository pr<br>• Age 6-12 yrs, 325 mg suppository pr |
| **Adenosine (Adenocard)**<br><br>**NCCEP Protocol:**<br>* 16-Adult Tachycardia Narrow Complex<br>* 17-Adult Tachycardia Wide Complex<br>* 52-Pediatric Tachycardia<br><br>**Indications/Contraindications:**<br>• Specifically for treatment or diagnosis of Supraventricular Tachycardia | • 6 mg IV push over 1-3 seconds. If no effect after 1-2 minutes,<br>• Repeat with 12 mg IV push over 1-3 seconds.<br>• Repeat once if necessary<br>• (use stopcock and 20 ml Normal Saline flush with each dose) | • 0.1 mg/kg IV (Max 6 mg) push over 1-3 seconds. If no effect after 1-2 minutes,<br>• Repeat with 0.2 mg/kg IV (Max 12 mg) push over 1-3 seconds.<br>• Repeat once if necessary<br>• (use stopcock and Normal Saline flush with each dose) |
| **Albuterol Beta-Agonist**<br><br>**NCCEP Protocol:**<br>* 24-Allergic Reaction Anaphylaxis<br>* 26-COPD Asthma<br>* 56-Pediatic Allergic Reaction<br>* 61-Pediatric Respiratory Distress<br><br>**Indications/Contraindications:**<br>• Beta-Agonist nebulized treatment for use in respiratory distress with bronchospasm | • 2.5-5.0 mg (3cc) in nebulizer continuously x 3 doses. See local protocol for relative contraindications and/or indications to contact medical control for use of this drug. | • **See Color Coded List**<br>• 2.5mg (3cc) in nebulizer continuously x 3 doses. See local protocol for relative contraindications and/or indications to contact medical control for use of this drug. |

# Drug List

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Amiodarone (Cordarone)**<br><br>**NCCEP Protocol:**<br>* 17-Adult Tachycardia Wide Complex<br>* 18-VF Pulseless VT<br>* 52-Pediatric Tachycardia<br>* 53-Pediatric VF Pulseless VT<br>* 54-Pediatric Post Resuscitation<br><br>**Indications/Contraindications:**<br>• Antiarrhythmic used mainly in wide complex tachycardia and ventricular fibrillation.<br>• Avoid in patients with heart block or profound bradycardia.<br>• Contraindicated in patients with iodine hypersensitivity | V-fib / pulseless V-tach<br>• 300 mg **(Remember to dilute in 20-30 ml of D5W)** IV push<br>• Repeat dose of 150 mg **(Remember to dilute in 20-30 ml of D5W)** IV push for recurrent episodes<br><br>V-tach with a pulse<br>• 150 mg in 100cc D5W over 10 min | V-fib / pulseless V-tach<br>• 5 mg/kg IV push over 5 minutes<br>• May repeat up to 15mg/kg IV<br><br>V-tach with a pulse<br>• 5 mg/kg IV push over 5 minutes<br>• May repeat up to 15mg/kg IV<br>• Avoid in Length Tape Color Pink |
| **Aspirin**<br><br>**NCCEP Protocol:**<br>* 7-Pain Control Adult<br>* 14-Chest Pain and STEMI<br><br>**Indications/Contraindications:**<br>• An antiplatelet drug for use in cardiac chest pain | • 81 mg chewable (baby) Aspirin Give 4 tablets to equal usual adult dose. | ∅ |
| **Atropine**<br><br>**NCCEP Protocol:**<br>* 12-Bradycardia Pulse Present<br>* 49-Pediatric Bradycardia<br>* 84-WMD Nerve Agent<br><br>**Indications/Contraindications:**<br>• Anticholinergic drug used in bradycardias.<br>• (For Endotracheal Tube use of this drug, double the dose)<br>• In Organophosphate toxicity, large doses may be required (>10 mg) | Bradycardia<br>• 0.5 - 1.0 mg IV every 3 – 5 minutes up to 3 mg.<br>(If endotracheal -- max 6 mg)<br><br>Organophosphate<br>• 1-2 mg IM or IV otherwise as per medical control | • **See Color Coded List**<br><br>Bradycardia<br>• 0.02 mg/kg IV, IO (Max 0.5 mg per dose, Max total dose 1mg IV)<br>• (Min 0.1 mg) per dose<br>• May repeat in 3 - 5 minutes<br><br>Organophosphate<br>• 0.05 mg/kg IV or IO otherwise as per medical control |

# Drug List

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Atropine and Pralidoxime Auto-Injector**<br>**Nerve Agent Kit**<br><br>**NCCEP Protocol:**<br>* 84-WMD Nerve Agent<br><br>**Indications/Contraindications:**<br>• Antidote for Nerve Agents or Organophosphate Overdose | • One auto-injector then per medical control | • **See Color Coded List**<br>• One pediatric auto-injector then as per medical control |
| **Calcium Chloride**<br><br>**NCCEP Protocol:**<br>* 28-Dialysis Renal Failure<br>* 31-Overdose Toxic Ingestion<br>* 60-Ped OD Toxic Ingestion<br>* 83-Marine Envenomations<br>* 88-Crush Syndrome<br><br>**Indications/Contraindications:**<br>• Indicated for severe hyperkalemia | • 1 gm IV / IO<br>• Avoid use if pt is taking digoxin | • **See Color Coded List**<br>• 20 mg/kg IV or IO slowly |
| **Dextrose 10%, 25%, 50%**<br>**Glucose solutions**<br><br>**NCCEP Protocol:**<br>* Multiple<br><br>**Indications/Contraindications:**<br>• Use in altered mental status or hypoglycemic states | See local protocol for concentration and dosing | • **See Color Coded List**<br><br>See local protocol for concentration and dosing |

# Drug List



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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Diazepam (Valium) Benzodiazepene**<br><br>**NCCEP Protocol:**<br>* 32-Seizure<br>* 39-Obstetrical Emergency<br>* 62-Pediatric Seizure<br><br>**Indications/Contraindications:**<br>• Seizure control<br>• Mild Sedation | • 2-5 mg IV/IO initially then 2 mg IV/IO every 3 - 5 minutes up to 10 mg max unless med control dictates<br>• Do not administer IM. The drug is not absorbed.<br>• 10 mg Rectally if unable to obtain an IV. | • **See Color Coded List**<br>• 0.1 - 0.3 mg/kg IV/IO<br>• (Max dose 4 mg IV, IO)<br>• 0.5 mg/kg rectally (Dia-Stat)<br>• (Max dose 10 mg rectally)<br>• Repeat as directed by local protocol |
| **Diltiazem (Cardizem) Calcium Channel Blocker**<br><br>**NCCEP Protocol:**<br>* 16-Adult Tachycardia Narrow Complex<br><br>**Indications/Contraindications:**<br>• Calcium channel blocker used to treat narrow complex SVT<br>• Contraindicated in patients with heart block, ventricular tachycardia, and/or acute MI | See local protocol for dosing<br><br>• (20 mg IV over 2 minutes) | ∅ |
| **Diphenhydramine (Benadryl)**<br><br>**NCCEP Protocol:**<br>* 24-Allergic Reaction Anaphylaxis<br>* 56-Pediatic Allergic Reaction<br><br>**Indications/Contraindications:**<br>• Antihistamine for control of allergic reactions | • 25-50 mg IV/IO/IM/PO | • **See Color Coded List**<br>• 1 mg/kg IV/IO/IM/PO<br>• Do not give in infants < 3 mo |

# Drug List

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Dopamine**<br>**NCCEP Protocol:**<br>* Multiple<br>**Indications/Contraindications:**<br>• A vasopressor used in shock or hypotensive states | • 5 - 20 micrograms/kg/min IV or IO, titrate to BP systolic of 90 mmHg | • **See Color Coded List**<br>• 2 - 20 micrograms/kg/min IV or IO, titrate to BP systolic appropriate for age |
| **Epinephrine 1:1,000**<br>**NCCEP Protocol:**<br>* Multiple<br>**Indications/Contraindications:**<br>• Vasopressor used in allergic reactions or anaphylaxis | • 0.3 mg IM<br>• See local protocol for relative contraindications and/or indications to contact medical control for use of this drug.<br>• 0.15 mg IM (if age > 50 yrs)<br>**Nebulized Epinephrine**<br>• 1 mg mixed with 2 ml of Normal Saline | • **See Color Coded List**<br>• 0.01 mg/kg IM<br>• (Max dose 0.3 mg)<br>**Nebulized Epinephrine**<br>• 1 mg mixed with 2 ml of Normal Saline |
| **Epinephrine 1:10,000**<br>**NCCEP Protocol:**<br>* Multiple<br>**Indications/Contraindications:**<br>• Vasopressor used in cardiac arrest. | • 1.0 mg IV / IO<br>• Repeat every 3 - 5 minutes until observe response<br>• (May be given by Endotracheal tube in double the IV dose) | • **See Color Coded List**<br>• 0.01 mg/kg IV or IO<br>• (Max dose 1 mg)<br>• Repeat every 3 - 5 minutes per protocol<br>• (May be given by Endotracheal tube in double the IV dose) |
| **Etomidate (Amidate)**<br>**NCCEP Protocol:**<br>* 4-Airway Rapid Sequence Intubation<br>* 20-Induced Hypothermia<br>**Indications/Contraindications:**<br>• Sedative used in Drug Assisted Intubation | • 0.3 mg/kg IV / IO<br>• Usual adult dose = 20 mg | ∅ |

# Drug List



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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Fentanyl (Sublimaze) Narcotic Analgesic**<br><br>**NCCEP Protocol:**<br>* Multiple<br><br>**Indications/Contraindications:**<br>• Narcotic pain relief<br>• Possible beneficial effect in pulmonary edema<br>• Avoid use if BP < 110 | • 50-100 mcg IM/IV/IO bolus then 50 mcg IM/IV/IO every 5 minutes until a maximum of 200 mcg or clinical improvement<br>• Peak effects: 3-5 minutes | • **See Color Coded List**<br>• 1 mcg/kg IM/IN/IV/IO<br>May repeat 0.5 mcg/kg every 5 minutes<br>Maximum dose 2 mcg/kg |
| **Furosemide (Lasix)**<br><br>**NCCEP Protocol:**<br>* 15-CHF Pulmonary Edema<br>* 50-Pediatric CHF Pulmonary Edema<br><br>**Indications/Contraindications:**<br>• Diuretic for pulmonary edema or CHF but no proven benefit in prehospital care | • See local protocol for dosing guidelines<br>• 40 mg SIVP (over 2 mins)<br>• **Requires** Medical Control Order if need to dose to equal patient's normal single home PO dose (Maximum dose = 120 mg) | • See local protocol for dosing guidelines<br>• Requires Med Control Order<br>• 1 mg/kg IV |
| **Glucagon**<br><br>**NCCEP Protocol:**<br>* 27-Diabetic; Adult<br>* 31-Overdose Toxic Ingestion<br>* 58-Pediatric Diabetic<br>* 60-Ped OD Toxic Ingestion<br><br>**Indications/Contraindications:**<br>• Drug acting to release glucose into blood stream by glycogen breakdown<br>• Use in patients with no IV access | • 1 - 2 mg IM<br>• Repeat blood glucose measurement in 15 minutes, if ≤ 69 mg / dl repeat dose. | • **See Color Coded List**<br>• 0.1 mg/kg IM, Maximum 1 mg<br>• Repeat blood glucose measurement in 15 minutes, if ≤ 69 mg / dl repeat dose. |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Glucose Oral**<br>**Glucose Solutions**<br><br>**NCCEP Protocol:**<br>* 27-Diabetic; Adult<br>* 58-Pediatric Diabetic<br><br>**Indications/Contraindications:**<br>• Use in conscious hypoglycemic states | • One tube or packet<br>• Repeat based on blood glucose results, per protocol | • **See Color Coded List**<br>• One Tube or packet<br>• Repeat based on blood glucose results, per protocol<br>• Consider patient's ability to swallow and follow directions based on age |
| **Haloperidol**<br>**(Haldol)**<br>**Phenothiazine Preperation**<br><br>**NCCEP Protocol:**<br>* 6-Behavioral<br><br>**Indications/Contraindications:**<br>• Medication to assist with sedation of agitated patients | • 5-10 mg IV/IM, per local protocol<br>• See local protocol for relative contraindications and/or indications to contact medical control for use of this drug. | Ø |
| **Famotidine**<br>**(Pepcid)**<br>**Histamine-2 Blocker**<br><br>**NCCEP Protocol:**<br>* 24-Allergic Reaction/Anaphylaxis<br>* 56-Pediatric Allergic Reaction<br><br>**Indications/Contraindications:**<br>• Medication used to control stomach acid and to assist in severe allergic reactions | • 20 mg IV | • 0.25 mg/kg IV over 1 year old |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Ibuprofen (Motrin) Non-steroidal Anti-inflammatory Drug**<br><br>**NCCEP Protocol:**<br>* 7-Pain Control Adult<br>* 46-Pediatric Pain Control<br>* 72-Fever<br><br>**Indications/Contraindications:**<br>• Avoid NSAIDS in women who are pregnant or could be pregnant.<br>• A nonsteroidal anti-inflammatory drug (NSAID) used for pain and fever control.<br>• Not to be used in patients with history of GI Bleeding (ulcers) or renal insufficiency.<br>• Not to be used in patients with allergies to aspirin or other NSAID drugs<br>• Avoid in patients currently taking anticoagulants, such as coumadin. | • 400-800 mg po | • **See Color Coded List**<br>• 10 mg/kg po<br>• Do not use in patients 6 months of age or younger |
| **Ipratropium (Atrovent)**<br><br>**NCCEP Protocol:**<br>* 24-Allergic Reaction Anaphylaxis<br>* 26-COPD Asthma<br>* 56-Pediatic Allergic Reaction<br>* 61-Pediatric Respiratory Distress<br><br>**Indications/Contraindications:**<br>• Medication used in addition to albuterol to assist in patients with asthma and COPD | • 2 puffs per dose of MDI (18 mcg/spray)<br>--- OR ---<br>• 0.5 mg per nebulizer treatment | • Use in Pediatrics as a combined Therapy with a Beta Agonist such as Albuterol<br>• 2 puffs per dose of MDI (18 mcg/spray)<br>--- OR ---<br>• 0.5 mg per nebulizer treatment |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Ketorolac (Toradol) Non-steroidal Anti-inflammatory Drug**<br><br>**NCCEP Protocol:**<br>* 7-Pain Control Adult<br>* 46-Pediatric Pain Control<br><br>**Indications/Contraindications:**<br>• Avoid NSAIDS in women who are pregnant or could be pregnant<br>• A nonsteroidal anti-inflammatory drug used for pain control.<br>• Not to be used in patients with history of GI bleeding (ulcers), renal insufficiency, or in patients who may need immediate surgical intervention (i.e. obvious fractures).<br>• Not to be used in patients with allergies to aspirin or other NSAID drugs such as motrin<br>• Avoid in patients currently taking anticoagulants such as coumadin | • 30 mg IV / IO or 60 mg IM<br><br>• 30 mg IV (15 mg over 65 years of age or under 50 kg)<br>• 60 mg IM (30 mg over 65 years of age or under 50 kg) | • 0.5 mg/kg IV / IO / IM Maximum 30 mg |
| **Lactated Ringer's Solution**<br><br>**NCCEP Protocol:**<br>* 40-Adult Thermal Burn<br>* 67-Pediatric Thermal Burn<br><br>**Indications/Contraindications:**<br>• Crystalloid solution preferred for fluid rescuscitation and preferred in burn care. | • Dosing per protocol, similar to Normal Saline | • Dosing per protocol, similar to Normal Saline |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Lidocaine**<br><br>**NCCEP Protocol:**<br>* 4-Airway Rapid Sequence Intubation<br>* 18-VF Pulseless VT<br>* 53-Pediatric VF Pulseless VT<br><br>**Indications/Contraindications:**<br>• Antiarrhythmic used for control of ventricular dysrrythmias<br>• Anesthetic used during intubation to prevent elevated intracranial pressures during intubation | • 1.5 mg/kg IV / IO bolus (ETT dose = 2 x IV dose) up to 3mg/kg max bolus dose<br>• Initial Dose 0.75 mg/kg in patients ≥ 60 years of age.<br>• Repeat 1/2 initial dose in 10 minutes.<br>• No Drip Administration<br>• Endotracheal tube or NG tube prior to insertion as a topical pain management, 2% lidocaine jelly. | • See Color Coded List<br>• 1 mg/kg IV / IO<br>Maximum 100 mg<br>Repeat 0.5 mg/kg<br>Maximum 3 mg/kg total<br><br>• Introsseous: administer 10-20 mg (1 – 2 ml) of 1% lidocaine, preservative-free, without Epinephrine (not jelly) for infusion related pain; flush with line with 10 ml of IV fluid. |
| **Magnesium Sulfate**<br><br>**NCCEP Protocol:**<br>* Multiple<br><br>**Indications/Contraindications:**<br>• Elemental electrolyte used to treat eclampsia during the third trimester of pregnancy.<br>• A smooth muscle relaxor used in refractory respiratory distress resistent to beta-agonists | **Respiriatory Distress:**<br>• 2 g IV / IO over 10 minutes<br>• Repeat dosing per local protocol<br><br>**Obstetrical Seizure:**<br>• 2 g IV / IO over 2-3 minutes<br>• Dose may be repeated once, or as per local protocol | • 40 mg/kg IV / IO over 20 minutes (Max 2 gms)<br>• Repeat dosing per local protocol |
| **Methylprednisolone (Solu-medrol) Steroid Preparation**<br><br>**NCCEP Protocol:**<br>* 24-Allergic Reaction Anaphylaxis<br>* 26-COPD Asthma<br>* 56-Pediatic Allergic Reaction<br>* 61-Pediatric Respiratory Distress<br><br>**Indications/Contraindications:**<br>• Steroid used in respiratory distress to reverse inflammatory and allergic reactions | • 125 mg IV / IO<br>• IM dosing only if indicated by local protocol | • See Color Coded List<br>• 2 mg/kg IV / IO (Max 125 mg)<br>• IM dosing only if indicated by local protocol |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Midazolam (Versed) Benzodiazepine**<br><br>**NCCEP Protocol:**<br>* Multiple<br><br>**Indications/Contraindications:**<br>• Benzodiazepine used to control seizures and sedation<br>• Quick acting Benzodiazepine<br>• Preferred over Valium for IM use<br>• Use with caution if BP < 110 | • See individual protocols for dosing<br>• Usual total dose: 2.5-5 mg IV / IO / IM<br><br>• 1 - 2 mg IV/IO slowly over 2-3 minutes. May slowly titrate dose up to 5 mg total if needed. Usual total dose: 2.5 - 5 mg<br>• 1 - 2 mg Nasally via Atomizer. Usual total dose: 2 - 5 mg<br>• IM dosage: 5 mg | • **See Color Coded List**<br>• See individual protocols for dosing<br>• Usual total dose 0.1-0.2 mg/kg IV / IO / IM / IN |
| **Morphine Sulfate Narcotic Analgesic**<br><br>**NCCEP Protocol:**<br>* Multiple<br><br>**Indications/Contraindications:**<br>• Narcotic pain relief<br>• Possible beneficial effect in pulmonary edema<br>• Avoid use if BP < 110 | • 4 mg IM/IV/IO bolus then 2 mg IM/IV/IO every 5-10 minutes until a maximum of 10 mg or clinical improvement | • **See Color Coded List**<br>• 0.1 mg/kg IV / IO / IM<br>May repeat every 5 minutes<br>Maximum single dose 5 mg<br>Maximum dose 10 mg |
| **Naloxone (Narcan) Narcotic Antagonoist**<br><br>**NCCEP Protocol:**<br>* 31-Overdose Toxic Ingestion<br>* 60-Ped OD Toxic Ingestion<br><br>**Indications/Contraindications:**<br>• Narcotic antagonist | • 0.4 - 2 mg IV / IO / IM / IN / ETT bolus titrated to patient's respiratory response | • **See Color Coded List**<br>• 0.1 mg/kg IV / IO / IN / IM / ETT (Max 2 mg)<br>• Repeat as per protocol |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Normal Saline Crystalloid Solutions**<br><br>**NCCEP Protocol:**<br>* Multiple<br><br>**Indications/Contraindications:**<br>• IV fluid for IV access or volume infusion | • See individual protocol for bolus dosing and/or infusion rate | • **See Color Coded List**<br>• See individual protocol for bolus dosing and/or infusion rate<br>• Usual initial bolus 20 mL / kg IV / IO |
| **Nitroglycerin**<br><br>**NCCEP Protocol:**<br>* 14-Chest Pain and STEMI<br>* 15-CHF Pulmonary Edema<br><br>**Indications/Contraindications:**<br>• Vasodilator used in anginal syndromes and CHF. | • 0.3 / 0.4 mg SL every 5 minutes until painfree<br>• See Chest Pain Protocol for paste dosing | ∅ |
| **Nitrous Oxide**<br><br>**NCCEP Protocol:**<br>* 7-Pain Control Adult<br><br>**Indications/Contraindications:**<br>• Medication used to assist with control of pain | • Inhaled gas to effect per local protocol | • Inhaled gas to effect per local protocol |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Ondansetron (Zofran) Anti-emetic**<br><br>**NCCEP Protocol:**<br>* 23-Abdominal Pain Protocol<br>* 35-Vomiting and Diarrhea<br>* 63-Pediatric Vomiting and Diarrhea<br><br>**Indications/Contraindications:**<br>• Anti-Emetic used to control Nausea and/or Vomiting<br>• Ondansetron (Zofran) is the recommended Anti-emetic for EMS use since it is associated with significantly less side effects and sedation. | • 4 mg IV / IO / IM / PO / ODT<br>• Repeat only as per local protocol | • 0.15 mg/kg IV / IO / IM (Max 4 mg)<br>• 0.2 mg/kg PO / ODT (Max 4 mg)<br>• Repeat only as per local protocol |
| **Oxygen**<br><br>**NCCEP Protocol:**<br>* Multiple<br><br>**Indications/Contraindications:**<br>• Indicated in any condition with increased cardiac work load, respiratory distress, or illness or injury resulting in altered ventilation and/or perfusion. Goal oxygen saturation 94-99%.<br>• Indicated for pre-oxygenation whenever possible prior to endotracheal intubation. Goal oxygen saturation 100%. | • 1-4 liters/min via nasal cannula<br>• 6-15 liters/min via NRB mask<br>• 15 liters via BVM / ETT / BIAD | • 1-4 liters/min via nasal cannula<br>• 6-15 liters/min via NRB mask<br>• 15 liters via BVM / ETT / BIAD |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Oxymetazoline (Afrin or Otrivin) Nasal Decongestant Spray**<br><br>**NCCEP Protocol:**<br>* 71-Epistaxis<br><br>**Indications/Contraindications:**<br>• Vasoconstrictor used with nasal intubation and epistaxis<br>• Relative Contraindication is significant hypertension | • 2 sprays in affected nostril<br>• Usual concentration is 0.05% by volume | • **See Color Coded List**<br>• 1-2 sprays in affected nostril<br>• Usual concentration is 0.05% by volume |
| **Pralidoxime (2-PAM)**<br><br>**NCCEP Protocol:**<br>* 84-WMD Nerve Agent<br><br>**Indications/Contraindications:**<br>• Antidote for Nerve Agents or Organophosphate Overdose<br>• Administered with Atropine | • 600 mg IV / IO / IM over 30 minutes for minor symptoms<br>• 1800 mg IV / IO / IM over 30 minutes for major symptoms<br>• See local protocol for minor versus major indications | • 15 – 25 mg/kg IV / IM / IO over 30 minutes<br>• See local protocol for specific pediatric dosing recommendations |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Promethazine (Phenergan) Anti-emetic**<br><br>**NCCEP Protocol:**<br>* 23-Abdominal Pain<br>* 35-Vomiting and Diarrhea<br><br>**Indications/Contraindications:**<br>• IV Promethazine (Phenergan) should be given IV only with great caution. Extravasation of this drug can result in significant local tissue damage.<br>• Anti-Emetic used to control Nausea and/or Vomiting<br>• Ondansetron (Zofran) is the recommended Anti-emetic for EMS use since it is associated with significantly less side effects and sedation. | • 12.5 mg IV / IO / IM<br>• May repeat as per local protocol | Ø |
| **Rocuronium**<br><br>**NCCEP Protocol:**<br>* 4-Airway Rapid Sequence Intubation<br><br>**Indications/Contraindications:**<br>• Non-depolarizing paralytic agent used as a component of drug assisted intubation (Rapid Sequence Intubation), when succinylcholine is contraindicated.<br>• Onset of action is longer than succinylcholine, up to 3 minutes, patient will NOT defasciculate. | • 1 mg / kg IV / IO<br>• Only may repeat x1 per RSI protocol | Ø |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Sodium Bicarbonate**<br><br>**NCCEP Protocol:**<br>* 28-Dialysis Renal Failure<br>* 31-Overdose Toxic Ingestion<br>* 60-Ped OD Toxic Ingestion<br>* 88-Crush Syndrome<br><br>**Indications/Contraindications:**<br>• A buffer used in acidosis to increase the pH in Cardiac Arrest, Hyperkalemia or Tricyclic Overdose. | • Initial bolus 50 mEq IV / IO<br>• See individual protocol for specific dosing algorithm. | • **See Color Coded List**<br>• Initial bolus 1 mEq / kg IV / IO<br>• Maximum 50 mEq<br>• See individual protocol for specific dosing algorithm. |
| **Succinylcholine**<br>**Paralytic Agent**<br><br>**NCCEP Protocol:**<br>* 4-Airway Rapid Sequence Intubation<br><br>**Indications/Contraindications:**<br>• Paralytic Agent used as a component of Drug Assisted Intubation (Rapid Sequence Intubation)<br>• Avoid in patients with burns >24 hours old, chronic neuromuscular disease (e.g., muscular dystrophy), ESRD, or other situation in which hyperkalemia is likely. | • 1.5 mg/kg IV / IO<br>• Only may repeat x1 per RSI protocol | ∅ |

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| Medication | Adult Dosing | Pediatric Dosing |
|---|---|---|
| **Vasopressin (Pitressin)**<br><br>**NCCEP Protocol:**<br>* 11-Asystole Pulseless Electrical Activity<br>* 18-VF Pulseless VT<br><br>**Indications/Contraindications:**<br>• Medication used in place of and/or in addition to epinephrine in the setting of cardiac arrest | • 40 units IV / IO, may replace first or second dose of epinephrine | Ø |
| **Vecuronium Paralytic Agent**<br><br>**NCCEP Protocol:**<br>* 4-Airway Rapid Sequence Intubation<br>* 19-Post Resuscitation<br>* 20-Induced Hypothermia<br><br>**Indications/Contraindications:**<br>• Long-acting non-depolarizing paralytic agent<br>• Avoid in patients with chronic neuromuscular disease (e.g., muscular dystrophy). | • 0.1 mg/kg IV / IO or 10 mg IV / IO, as per individual protocol<br>• Only may repeat dosing as per individual protocol | Ø |

# Pediatric Color Coded Drug List

## Weight 3-5 Kg (Avg 4.0 Kg)

Length < 59.5 cm

**Vital Signs**

| | |
|---|---|
| Heart Rate | 120-150 |
| Respirations | 24-48 |
| BP Systolic | 70 (+/-25) |

**Equipment**

| | |
|---|---|
| ET Tube | 2.5 - 3.5 |
| Blade Size | 0 - 1 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 8 J, 15 J |
| Cardioversion | 2 J,4 J |

**Normal Saline** 80 ml

| | | |
|---|---|---|
| Acetaminophen | | 64 mg |
| Adenosine | 1st Dose- | 0.3 mg |
| | Repeat Dose- | 0.6 mg |
| Afrin Nasal Spray | | HOLD |
| Albuterol | | 2.5mg |
| Amiodarone | | 20 mg |
| Atropine | | 0.10 mg |
| Calcium Chloride | | 80 mg |
| Charcoal | | N/A |
| Dextrose 10% | | 20 ml |
| Diazepam | (IV) | 0.8 mg |
| | (Rectal) | 2.0 mg |
| Dilaudid | | HOLD |
| Diphenhydramine | | 6.5 mg |
| Dopamine (800 mg in 500 cc) | | |
| 2 | mcg/kg/min | 0.3 ml/hr |
| 5 | mcg/kg/min | 0.9 ml/hr |
| 10 | mcg/kg/min | 1.7 ml/hr |
| 20 | mcg/kg/min | 3.3 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.04 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Epinephrine 1:1000 IM | 0.05 mg |
| Fentanyl | 8.0 mcg |
| Glucagon | 0.5 mg |
| Ibuprofen | N/A |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.31 mg |
| Lidocaine | 4 mg |
| Lorazepam | 0.2 mg |
| Magnesium Sulfate | 200 mg |
| Methylprednisolone | 6.25 mg |
| Midazolam | 0.5 mg |
| Morphine Sulfate | 0.4 mg |
| Naloxone | 0.4 mg |
| Ondansetron | 0.6 mg |
| Prednisone | 4.0 mg |
| Sodium Bicarbonate | 4 mEq |

Gray (0-3 months)

## Weight 6-7 Kg (Avg 6.5 Kg)

Length 59.5-66.5 cm

**Vital Signs**

| | |
|---|---|
| Heart Rate | 120-125 |
| Respirations | 24-48 |
| BP Systolic | 85 (+/-25) |

**Equipment**

| | |
|---|---|
| ET Tube | 3.5 |
| Blade Size | 1 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 10 J, 20 J |
| Cardioversion | 2 J, 5 J |

**Normal Saline** 130 ml

| | | |
|---|---|---|
| Acetaminophen | | 96 mg |
| Adenosine | 1st Dose- | 0.6 mg |
| | Repeat Dose- | 1.2 mg |
| Afrin Nasal Spray | | HOLD |
| Albuterol | | 2.5 mg |
| Atropine | | 0.13 mg |
| Amiodarone | | 30 mg |
| Calcium Chloride | | 130 mg |
| Charcoal | | HOLD |
| Dextrose 10% | | 35 ml |
| Diazepam | (IV) | 1.3 mg |
| | (Rectal) | 3.2 mg |
| Dilaudid | | HOLD |
| Diphenhydramine | | 5 mg |
| Dopamine (800 mg in 500 cc) | | |
| 2 | mcg/kg/min | 0.5 ml/hr |
| 5 | mcg/kg/min | 1.3 ml/hr |
| 10 | mcg/kg/min | 2.5 ml/hr |
| 20 | mcg/kg/min | 5.0 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.06 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Epinephrine 1:1000 IM | 0.06 mg |
| Fentanyl | 13.0 mcg |
| Glucagon | 0.5 mg |
| Ibuprofen | N/A |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.31 mg |
| Lidocaine | 6 mg |
| Lorazepam | 0.33 mg |
| Magnesium Sulfate | 300 mg |
| Methylprednisolone | 12.5 mg |
| Midazolam | 0.5 mg |
| Morphine Sulfate | 0.6 mg |
| Naloxone | 0.6 mg |
| Ondansetron | 1.0 mg |
| Prednisone | 6.5 mg |
| Sodium Bicarbonate | 6 mEq |

Pink (3-6 Months)

## Weight 8-9 Kg (Avg 8.5 Kg)

Length 66.5-74 cm

**Vital Signs**

| | |
|---|---|
| Heart Rate | 120 |
| Respirations | 24-32 |
| BP Systolic | 92 (+/-30) |

**Equipment**

| | |
|---|---|
| ET Tube | 3.5-4.0 |
| Blade Size | 1 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 20 J, 40 J |
| Cardioversion | 5 J, 9 J |

**Normal Saline** 170 ml

| | | |
|---|---|---|
| Acetaminophen | | 128 mg |
| Adenosine | 1st Dose- | 0.9 mg |
| | Repeat Dose- | 1.8 mg |
| Afrin Nasal Spray | | HOLD |
| Albuterol | | 2.5 mg |
| Atropine | | 0.17 mg |
| Amiodarone | | 40 mg |
| Calcium Chloride | | 170 mg |
| Charcoal | | HOLD |
| Dextrose 10% | | 43 ml |
| Diazepam | (IV) | 1.7 mg |
| | (Rectal) | 4.25 mg |
| Dilaudid | | HOLD |
| Diphenhydramine | | 10 mg |
| Dopamine (800 mg in 500 cc) | | |
| 2 | mcg/kg/min | 0.7 ml/hr |
| 5 | mcg/kg/min | 1.6 ml/hr |
| 10 | mcg/kg/min | 3.2 ml/hr |
| 20 | mcg/kg/min | 6.5 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.08 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Epinephrine 1:1000 IM | 0.08 mg |
| Fentanyl | 17.0 mcg |
| Glucagon | 0.5 mg |
| Ibuprofen | 4.0 ml |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.31 mg |
| Lidocaine | 8 mg |
| Lorazepam | 0.43 mg |
| Magnesium Sulfate | 400 mg |
| Methylprednisolone | 12.5 mg |
| Midazolam | 0.85 mg |
| Morphine Sulfate | 0.8 mg |
| Naloxone | 0.8 mg |
| Ondansetron | 1.2 mg |
| Prednisone | 8.5 mg |
| Sodium Bicarbonate | 8 mEq |

Red (7-10 Months)

# Pediatric Color Coded Drug List

## Weight 10-11 Kg (Avg 10.5 Kg)

Length 74-84.5 cm

Purple (11-18 Months)

**Vital Signs**

| | |
|---|---|
| Heart Rate | 115-120 |
| Respirations | 22-30 |
| BP Systolic | 96 (+/-30) |

**Equipment**

| | |
|---|---|
| ET Tube | 4.0 |
| Blade Size | 1 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 20 J, 40 J |
| Cardioversion | 5 J, 10 J |

**Normal Saline** 210 ml

| | | |
|---|---|---|
| Acetaminophen | | 160 mg |
| Adenosine | 1st Dose- | 0.9 mg |
| | Repeat Dose- | 1.8 mg |
| Afrin Nasal Spray | | HOLD |
| Albuterol | | 2.5 mg |
| Atropine | | 0.2 mg |
| Amiodarone | | 50 mg |
| Calcium Chloride | | 210 mg |
| Charcoal | | HOLD |
| Dextrose 10% | | 50 ml |
| Diazepam | (IV) | 1.0 mg |
| | (Rectal) | 5.0 mg |
| Dilaudid | | HOLD |
| Diphenhydramine | | 10 mg |
| Dopamine | | |
| (800 mg in 500 ml Normal Saline) | | |
| 2 | mcg/kg/min | 0.8 ml/hr |
| 5 | mcg/kg/min | 2.0 ml/hr |
| 10 | mcg/kg/min | 4.0 ml/hr |
| 20 | mcg/kg/min | 8.0 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.1 mg |
| Epinephrine 1:1000 IM | 0.1 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Fentanyl | 21.0 mcg |
| Glucagon | 1.0 mg |
| Ibuprofen | 5.0 ml |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.63 mg |
| Lidocaine | 10 mg |
| Lorazepam | 0.53 mg |
| Magnesium Sulfate | 500 mg |
| Methylprednisolone | 18.75 mg |
| Midazolam | 1.0 mg |
| Morphine Sulfate | 1.0 mg |
| Naloxone | 1.0 mg |
| Ondansetron | 1.6 mg |
| Prednisone | 10.5 mg |
| Sodium Bicarbonate | 10 mEq |

## Weight 12-14 Kg (Avg 13 Kg)

Length 84.5-97.5 cm

Yellow (19-35 Months)

**Vital Signs**

| | |
|---|---|
| Heart Rate | 110-115 |
| Respirations | 20-28 |
| BP Systolic | 100(+/-30) |

**Equipment**

| | |
|---|---|
| ET Tube | 4.5 |
| Blade Size | 2 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 30 J, 50 J |
| Cardioversion | 6 J, 15 J |

**Normal Saline** 260 ml

| | | |
|---|---|---|
| Acetaminophen | | 192 mg |
| Adenosine | 1st Dose- | 1.2 mg |
| | Repeat Dose- | 2.4 mg |
| Afrin Nasal Spray | | 1 spray |
| Albuterol | | 2.5 mg |
| Atropine | | 0.26 mg |
| Amiodarone | | 65 mg |
| Calcium Chloride | | 260 mg |
| Charcoal | | 15 gms |
| Dextrose 10% | | 60-80 ml |
| Diazepam | (IV) | 2.6 mg |
| | (Rectal) | 6.5 mg |
| Dilaudid | | HOLD |
| Diphenhydramine | | 10 mg |
| Dopamine | | |
| (800 mg in 500 ml Normal Saline) | | |
| 2 | mcg/kg/min | 0.8 ml/hr |
| 5 | mcg/kg/min | 2.5 ml/hr |
| 10 | mcg/kg/min | 5.0 ml/hr |
| 20 | mcg/kg/min | 10 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.10 mg |
| Epinephrine 1:1000 IM | 0.10 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Fentanyl | 26.0 mcg |
| Glucagon | 0.5 mg |
| Ibuprofen | 6.5 ml |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.63 mg |
| Lidocaine | 14 mg |
| Lorazepam | 0.65 mg |
| Magnesium Sulfate | 650 mg |
| Methylprednisolone | 25.0 mg |
| Midazolam | 1 mg |
| Morphine Sulfate | 1.0 mg |
| Naloxone | 1.3 mg |
| Ondansetron | 2.0 mg |
| Prednisone | 13.0 mg |
| Sodium Bicarbonate | 13 mEq |

## Weight 15-18 Kg (Avg 16.5 Kg)

Length 97.5-110 cm

White (3-4 yrs)

**Vital Signs**

| | |
|---|---|
| Heart Rate | 100-15 |
| Respirations | 20-26 |
| BP Systolic | 100(+/-20) |

**Equipment**

| | |
|---|---|
| ET Tube | 5.0 |
| Blade Size | 2 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 30 J, 70 J |
| Cardioversion | 8 J, 15 J |

**Normal Saline** 330 ml

| | | |
|---|---|---|
| Acetaminophen | | 240 mg |
| Adenosine | 1st Dose- | 1.8 mg |
| | Repeat Dose- | 3.6 mg |
| Afrin Nasal Spray | | 1 spray |
| Albuterol | | 2.5 mg |
| Atropine | | 0.32 mg |
| Amiodarone | | 80 mg |
| Calcium Chloride | | 330 mg |
| Charcoal | | 15-30 gms |
| Dextrose 10% | | 80 ml |
| Diazepam | (IV) | 3.3 mg |
| | (Rectal) | 8.25 mg |
| Dilaudid | | HOLD |
| Diphenhydramine | | 15 mg |
| Dopamine | | |
| (800 mg in 500 ml Normal Saline) | | |
| 2 | mcg/kg/min | 1.2 ml/hr |
| 5 | mcg/kg/min | 3.0 ml/hr |
| 10 | mcg/kg/min | 6.0 ml/hr |
| 20 | mcg/kg/min | 12 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.16 mg |
| Epinephrine 1:1000 IM | 0.20 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Fentanyl | 33.0 mcg |
| Glucagon | 0.5 mg |
| Ibuprofen | 8.0 ml |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.63 mg |
| Lidocaine | 15 mg |
| Lorazepam | 0.83 mg |
| Magnesium Sulfate | 800 mg |
| Methylprednisolone | 31.25 mg |
| Midazolam | 1.5 mg |
| Morphine Sulfate | 1.0 mg |
| Naloxone | 1.6 mg |
| Ondansetron | 2.4 mg |
| Prednisone | 16.5 mg |
| Sodium Bicarbonate | 16 mEq |

# Pediatric Color Coded Drug List

## Weight 19-22 Kg (Avg 20.75 Kg)

**Length 110-122 cm**

**Vital Signs**

| | |
|---|---|
| Heart Rate | 100 |
| Respirations | 20-24 |
| BP Systolic | 100(+/-15) |

**Equipment**

| | |
|---|---|
| ET Tube | 5.5 |
| Blade Size | 2 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 40 J, 85 J |
| Cardioversion | 10 J, 20 J |

**Normal Saline** 410 ml

| | | |
|---|---|---|
| Acetaminophen | | 288 mg |
| Adenosine | 1st Dose- | 2.1 mg |
| | Repeat Dose- | 4.1 mg |
| Afrin Nasal Spray | | 1 spray |
| Albuterol | | 2.5 mg |
| Atropine | | 0.4 mg |
| Amiodarone | | 100 mg |
| Calcium Chloride | | 420 mg |
| Charcoal | | 20-40 gms |
| Dextrose 10% | | 100 ml |
| Diazepam | (IV) | 4.0 mg |
| | (Rectal) | 10.0 mg |
| Dilaudid | | 0.31 mg |
| Diphenhydramine | | 25.0 mg |
| Dopamine | | |
| (800 mg in 500 ml Normal Saline) | | |
| 2 | mcg/kg/min | 1.6 ml/hr |
| 5 | mcg/kg/min | 3.9 ml/hr |
| 10 | mcg/kg/min | 7.8 ml/hr |
| 20 | mcg/kg/min | 16 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.2 mg |
| Epinephrine 1:1000 IM | 0.2 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Fentanyl | 40.0 mcg |
| Glucagon | 1.0 mg |
| Ibuprofen | 10.0 ml |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.63 mg |
| Lidocaine | 20 mg |
| Lorazepam | 1.0 mg |
| Magnesium Sulfate | 1000 mg |
| Methylprednisolone | 37.5 mg |
| Midazolam | 2.0 mg |
| Morphine Sulfate | 2.0 mg |
| Naloxone | 2.0 mg |
| Ondansetron | 3.0 mg |
| Prednisone | 20.0 mg |
| Sodium Bicarbonate | 20 mEq |

**Blue (5-6 yrs)**

## Weight 24-30 Kg (Avg 27 Kg)

**Length 122-137 cm**

**Vital Signs**

| | |
|---|---|
| Heart Rate | 90 |
| Respirations | 18-22 |
| BP Systolic | 105(+/-15) |

**Equipment**

| | |
|---|---|
| ET Tube | 6.0 |
| Blade Size | 2-3 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 50 J, 100 J |
| Cardioversion | 15 J, 30 J |

**Normal Saline** 540 ml

| | | |
|---|---|---|
| Acetaminophen | | 384 mg |
| Adenosine | 1st Dose- | 2.7 mg |
| | Repeat Dose- | 5.4 mg |
| Afrin Nasal Spray | | 1 spray |
| Albuterol | | 2.5 mg |
| Atropine | | 0.5 mg |
| Amiodarone | | 135 mg |
| Calcium Chloride | | 540 mg |
| Charcoal | | 25-50 gms |
| Dextrose 10% | | 135 ml |
| Diazepam | (IV) | 4.0 mg |
| | (Rectal) | 10.0 mg |
| Dilaudid | | 0.4 mg |
| Diphenhydramine | | 25 mg |
| Dopamine | | |
| (800 mg in 500 ml Normal Saline) | | |
| 2 | mcg/kg/min | 2 ml/hr |
| 5 | mcg/kg/min | 5 ml/hr |
| 10 | mcg/kg/min | 10 ml/hr |
| 20 | mcg/kg/min | 20 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.27 mg |
| Epinephrine 1:1000 IM | 0.3 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Fentanyl | 54.0 mcg |
| Glucagon | 1.0 mg |
| Ibuprofen | 13 ml |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.63 mg |
| Lidocaine | 20 mg |
| Lorazepam | 1.35 mg |
| Magnesium Sulfate | 1350 mg |
| Methylprednisolone | 54.0 mg |
| Midazolam | 2.0 mg |
| Morphine Sulfate | 2.0 mg |
| Naloxone | 2.0 mg |
| Ondansetron | 4.0 mg |
| Prednisone | 27.0 mg |
| Sodium Bicarbonate | 27 mEq |

**Orange (7-9 yrs)**

## Weight 32-40 Kg (Avg 36 Kg)

**Length 137-150 cm**

**Vital Signs**

| | |
|---|---|
| Heart Rate | 85-90 |
| Respirations | 16-22 |
| BP Systolic | 115(+/-20) |

**Equipment**

| | |
|---|---|
| ET Tube | 6.5 |
| Blade Size | 3 |

**Defibrillation**

| | |
|---|---|
| Defibrillation | 60 J, 150 J |
| Cardioversion | 15 J, 30 J |

**Normal Saline** 720 ml

| | | |
|---|---|---|
| Acetaminophen | | 544 mg |
| Adenosine | 1st Dose- | 3.6 mg |
| | Repeat Dose- | 7.2 mg |
| Afrin Nasal Spray | | 2 spray |
| Albuterol | | 2.5 mg |
| Atropine | | 0.5 mg |
| Amiodarone | | 180 mg |
| Calcium Chloride | | 700 mg |
| Charcoal | | 25-50 gms |
| Dextrose 10% | | 180 ml |
| Diazepam | (IV) | 4.0 mg |
| | (Rectal) | 10.0 mg |
| Dilaudid | | 0.54 mg |
| Diphenhydramine | | 35 mg |
| Dopamine | | |
| (800 mg in 500 ml Normal Saline) | | |
| 2 | mcg/kg/min | 2.7 ml/hr |
| 5 | mcg/kg/min | 7.0 ml/hr |
| 10 | mcg/kg/min | 14.0 ml/hr |
| 20 | mcg/kg/min | 28.0 ml/hr |

| | |
|---|---|
| Epinephrine 1:10,000 | 0.3 mg |
| Epinephrine 1:1000 IM | 0.3 mg |
| Epinephrine 1:1000 Nebulized | 2.0 mg |
| Fentanyl | 62.0 mcg |
| Glucagon | 1.0 mg |
| Ibuprofen | 18 ml |
| Ipratropium | 500 mcg |
| Levalbuterol | 0.63 mg |
| Lidocaine | 36 mg |
| Lorazepam | 1.8 mg |
| Magnesium Sulfate | 1800 mg |
| Methylprednisolone | 62.5 mg |
| Midazolam | 2.0 mg |
| Morphine Sulfate | 3.0 mg |
| Naloxone | 2.0 mg |
| Ondansetron | 4.0 mg |
| Prednisone | 36.0 mg |
| Sodium Bicarbonate | 36 mEq |

**Green (10-12 yrs)**