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Policies

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AMPUTATED/AVULSED PARTS

Amputated or avulsed parts should be wrapped in dry gauze or Kling, placed in a sealed plastic bag or wrapped in plastic and kept cool by placing on ice or a cold pack and transported with the patient to the hospital.

PROTECTION AGAINST BLOODBORNE AND AIRBORNE PATHOGENS

All EMS providers are required to have an exposure plan in place and are expected to adhere to it. Any indications of exposure or potential exposure refer to Door County Emergency Services Exposure Plan. Some general guidelines are listed below.

- Heavy duty leather gloves should be worn during extrication procedures to protect your hands against cuts and scratches that could become contaminated with a patient's blood or body fluids.
- Exam or surgical gloves should be worn at all times when in contact with bleeding or draining wounds, starting IV's or childbirth situations.
- In situations where blood or body fluids could be splashed into the mouth a surgical mask should be worn.
- Eye protection should be worn in those situations (tracheal intubation, suctioning, and ventilation with a demand-valve) where blood or body fluids could be splashed into the eye.
- IV cannulas, SQ and IM needles should not be recapped. A heavy plastic container should be present in the ambulance for disposal of contaminated needles and other sharps. The contaminated material should be properly disposed of at the hospital.
- Approved ventilation devices (bag-mask or demand-valve) should be immediately available and used in preference to mouth-to-mouth resuscitation.
- High efficiency particulate air (HEPA/N95) respirators must be worn at all times when in close contact with an individual with known or suspected TB.
- An alcohol-based foam or liquid hand cleanser should be available in the ambulance to clean hands. Any cuts or abrasions to your hands should be covered with Band-Aids.
- Vehicle interior, cot surfaces and equipment should be adequately cleaned and disinfected with an approved solution.
- Significant exposure forms are available in the emergency departments and should be completed for all parenteral and mucocutaneous exposure to blood and body fluids at the patient's receiving hospital. Exposure forms for airborne pathogens will also be made available. HIV prophylaxis for significant exposures should be considered, and should be discussed with the Medical Control physician immediately after such an exposure.

Policy 2

CHILD, SPOUSE, ELDER ABUSE/NEGLECT

Child Abuse is the physical, sexual, or emotional maltreatment of a child by a parent, family member, other caregiver, or non-caregiver.

- Emotional abuse is defined as emotional damage for which the child's parent, guardian or legal custodian has neglected, refused or been unable, for reasons other than poverty, to obtain the necessary treatment or to take steps to ameliorate the symptoms.
- Physical abuse is the physical injury inflicted on a child by other than accidental means. Physical injury includes but is not limited to lacerations, fractured bones, burns, internal injuries, severe or frequent bruising or great bodily harm as defined under Wisconsin statute s.939.22(14).

Child Neglect is the failure, refusal or inability on the part of the parent, guardian, legal custodian or other person exercising temporary or permanent control over a child, for reasons other than poverty, to provide necessary care, food, clothing, medical or dental care or shelter so as to seriously endanger the physical health of the child.

All suspected or actual cases of child abuse must be reported to police and/or Door County Human Services by all levels of health care providers under Wisconsin Statute Chapter 48.981. In addition spousal or elder abuse should be similarly handled, although not mandatory reportable. The primary objective of pre-hospital care is transport of the victim to the hospital.

Nothing should be said or done at the scene to arouse suspicions and prevent transport. A report should be made to the medical control physician on arrival at the hospital. If transport is refused in cases of abuse, the nearest police agency should be contacted for assistance.

Policy 3

DO NOT RESUSCITATE (DNR)

Purpose: To accurately identify patients who may not want life sustaining treatment initiated, and delineate the appropriate treatments to provide in this setting. **DNR does not mean: Do not treat!!**

Indications: A valid pre-hospital DNR order in the Door County Emergency Services is limited to the following:

1. A valid state DNR Bracelet or Necklace (Plastic or Metal)
2. A signed standardized state DNR form (Nursing homes, CBRF, Hospice)
3. Direct verbal order from the patient's primary care physician (in person or via phone)
4. A written, signed notation by the patient's primary care physician on the patient's record in a nursing home or extended care facility

Contra-indications: The following conditions invalidate a DNR order:

1. The patient expresses to any First Responder, EMT, Paramedic or health care provider the desire to be resuscitated. If this is done, the provider shall remove the DNR Bracelet.
2. The patient defaces, burns, cuts or otherwise destroys the DNR Bracelet.
3. The patient (or another individual at the patient's request) removes the DNR Bracelet.
4. The DNR bracelet appears to have been tampered with or removed.
5. Any Healthcare provider knows the patient to be pregnant.

Emergency Responders will/ can provide the following:

- Clear airway
- Control bleeding
- Administer oxygen
- Provide pain medication
- Position for comfort
- Provide emotional support
- Splint
- Administration of IV Fluids

Emergency Responders will **NOT** provide the following:

- Perform chest compressions
- Insert Advanced Airways
- Administer cardiac resuscitation drugs
- Provide ventilatory assistance
- Defibrillate

DO NOT RESUSCITATE (DNR) Cont.

Procedure:

1. Assess the patient.
2. If the patient is pulseless and non-breathing, check the patient's wrist for a DNR bracelet. If patient has no wrist/arms, check ankles and neck chain for possible do-not-resuscitate band attached.
3. If NO DNR bracelet is found on the patient's wrist or ankle or a neck chain, and the proper DNR paperwork is not readily available, provide usual care.
 - A. If a DNR bracelet is found on the patient's wrist and the bracelet is NOT defaced, do not undertake life support measures and instead provide comfort care measures, such as clearing the airway, providing oxygen, positioning for comfort, control of bleeding, provision of emotional support and provision of pain medication
4. Contact Medical Control for further orders.
5. Document the patient contact on the Emergency Medical Record Ambulance Run Record, including details of type of DNR order present and any therapeutic measures provided.
6. Copies of all documentation of patient DNR status should accompany the patient to the hospital if the patient is transported.

Do Not Resuscitate (DNR)

Additional Information:

1. The patient's desire not to be resuscitated is controlling. In the event that a friend, or member of the patient's family requests that resuscitative measures be taken, that person's request does not supersede a valid DNR order.
2. If there is any question about the presence, validity or meaning of a DNR order (including "chemical code", "ventilate only" or evidence of revocation) EMS personnel shall initiate full resuscitate measures and immediately contact the online medical control physician for clarification and further orders.
3. The Wisconsin Declaration to Physicians (DOH 0060) Rev 5/86 or "Living Will" and Durable Power of Attorney are not valid for pre-hospital situations. If presented with these documents as evidence of DNR status, initiate resuscitation and contact medical control for clarification and further orders.

Policy 4

General Principles for Medical Care

The following measures shall be applied to help promote prompt and efficient emergency medical care to the sick, ill, injured or infirmed. They shall be utilized by EMS personnel in the field, in the Emergency Department, and when dealing with On-line Medical Control Physicians.

- 1) The Safety of EMS personnel is paramount. Each scene must be properly evaluated for crew safety and hazards upon arrival and throughout patient care. Assess the need for additional public safety resources as soon as possible after arrival.
- 2) Proper Personal Protective Equipment and Body Substance Isolation must be utilized according to agency and industry standard.
- 3) A patient is any person who is requesting and/or in need of medical attention or medical assistance of any kind.
- 4) A patient care encounter shall be considered any event when subjective or objective signs or symptoms, or a patient complaint, results in evaluation or treatment.
- 5) All patients in the care of EMS shall be offered transport by ambulance to the nearest appropriate hospital, regardless of the nature of the complaint. In the event a patient for whom EMS has responded to refuses transport to the hospital, a properly executed refusal process must be completed.
- 6) In accordance with DCES guidelines, the appropriate transport destination for EMS patients transported by ambulance is an Emergency Department. Additional details concerning hospital destination based on clinical criteria are outlined in specific protocols and policies.
- 7) For all medical calls, upon initial patient contact, be prepared for immediate medical intervention appropriate for the call level (defibrillation, airway management, drug therapy, etc.)
- 8) Upon arrival at a scene where an initial EMS crew is rendering patient care, all subsequent arriving EMS crews should immediately engage the on-scene crew. The goal is to determine the status of assessment, triage and seamlessly assist in patient care.
- 9) Prior to the transfer of care between crews, the provider rendering initial care should directly interface with the provider assuming care, to ensure all pertinent information is conveyed.
- 10) Try to always obtain verbal consent prior to treatment. Respect the patient's right to privacy and dignity. Courtesy, concern and common sense will ensure the best possible patient care.

Policy 5

General Principles for Medical Care Cont.

- 11) Generally, initial assessment and therapy should be completed within 10 minutes after patient contact. Except for extensive extrication, or atypical situations, trauma patients should be en route to the receiving facility within 10 minutes and medical patients should be en route to the receiving facility within 20 minutes. Additional therapy, if indicated, should be performed during transport.
- 12) For all 911 calls where EMTs and Paramedics are in attendance, the Paramedic shall make final patient care decisions.
- 13) Prior to the administration of medication, assess for the possibility of medication allergies. If any questions arise in reference to medication allergies, contact on-line Medical Control prior to giving any medications.
- 14) When caring for pediatric patients, use the Broselow-Luten® weight/length based system or Houston Haines Book to determine medication dosages and equipment sizes.
- 15) An EMS Patient Care Report will be generated at the conclusion of each patient encounter. Paper form "Hand Off" reports should be left at the receiving hospital in accordance with state requirements.
- 16) For cases that do not exactly fit into a treatment category, refer to the general illness protocol and contact On Line Medical Control (OLMC) as needed.
- 17) To perform as a Basic EMT or Paramedic, personnel must be knowledgeable and proficient in the scope of practice described and taught in the National Scope of Practice Standardized Curriculum, approved by the Wisconsin EMS Unit, and must maintain active state licensure.
- 18) Members of your service who are credentialed with and function with DCES and are an RN, PA, or MD license may only practice within the scope of the agency's license.
- 19) Perform all procedures as per the Door County Emergency Services Protocols, Procedures section. If a procedure that is not addressed in that section and is deemed necessary, contact OLMC for orders prior to proceeding.
- 20) If OLMC gives orders for performance of a procedure that is not covered in the Door County Emergency Services Protocols, Procedures section, but is within the providers scope of practice, follow the National Standard Curriculum, and document in electronic patient care report.
- 21) For all patients requiring the administration of narcotics or sedative agents, continuous cardiac and oxygen saturation monitoring shall be performed.
- 22) The Poison Control Center should be contacted when handling calls involving poisonous/hazardous material exposures, overdoses or suspected envenomation. In the event that the Poison Control Center gives recommendations or orders that are not contained within these protocols, EMS providers are authorized to carry out their instructions. The Poison Control Center can be reached at 1.800.222.1222

Policy 5

General Principles for Medical Care Cont.

23) When using supplemental oxygen in accordance with adult or pediatric treatment protocols, adhere to the following:

- In patients who are non-critical, and have no evidence of respiratory distress, use only the concentration of oxygen needed to achieve oxygen saturation $\geq 92\%$. Typically this may be accomplished by the use of a nasal cannula.
- For patients with serious respiratory symptoms, persistent hypoxia, or where otherwise specified by protocol, use 100% supplemental oxygen via non-rebreather mask or BVM. Use caution in instances of rising end-tidal CO₂.

24) Precautions:

For Bloodborne and Airborne Exposure and prevention refer to Door County Emergency Services Exposure Plan.

HOSPITAL DESTINATION

- All patients should be transported to the hospital of their choice (when operationally feasible) unless the patient is unstable.
- All patients whose condition is judged to be unstable will be transported to the closest appropriate receiving facility.
- If several hospitals are within the same approximate distance from the scene. Allow the patient, and/ or patients' family to select the receiving facility of their choice.
- For transport destination of Stroke, STEMI, Trauma, or OB (>20weeks) patients, refer to the appropriate protocol.

STROKE:

- DCMC
- Aurora
- Bellin
- St. Mary's
- St. Vincent

STEMI:

- DCMC
- Aurora
- Bellin
- St. Vincent

TRAUMA:

- Aurora
- St. Vincent

OB:

- Aurora - **NICU**
- Bellin
- St. Mary's
- St. Vincent - **NICU**

PEDIATRIC TRAUMA <5 yrs old:

- St. Vincent

Infant Abandonment

Purpose:

Safe Haven Law

This law states that a parent may confidentially leave his or her unharmed newborn with any EMT, firefighter, police officer, or health care provider in the state with three (3) days of birth without fear of prosecution. This law is in place to help insure that newborns who were not wanted or expected would not be discarded or harmed in any way.

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 protocol.
7. Assure infant is secured in appropriate child restraint device for transport.
8. Document protocols, procedures, and agency notifications in the PCR.

Safe Place for Newborns Coordinator

(414) 447-3030

Crisis Line for Safe Place for Newborns

1-877-440-2229

Policy 7

MEDICAL CONTROL COMMUNICATIONS

There are three modalities of EMS to hospital communication:

1. Cellular Phone

▪ Door County Medical Center	743-7300
▪ Aurora Bay Care Medical Center	288-4070
	288-4068
▪ Bellin Hospital	433-6007
▪ St. Vincent Hospital Emergency Department	433-0312
	433-0347
	433-0459
▪ St. Mary's Hospital Emergency Department	498-8842
	498-1139

2. UHF Frequency

▪ Door County Medical Center	- Med Channel 6
▪ Aurora Bay Care Medical Center	- Med Channel 6
▪ Bellin Hospital	- Med Channel 6 or 7
▪ St. Vincent Hospital Emergency Department	- Med Channel 7
▪ St. Mary's Hospital Emergency Department	- Med Channel 8

Initial medical control contact should be made as follows:

- Basic Life Support: Report to medical control on all BLS calls on cellular phone or UHF Med Channel 6, 7 or 8.
- Advanced Life Support: Report to medical control on all ALS calls with either a cellular phone or UHF Med Channel 6, 7 or 8. If cellular phone is utilized, the speaker phone may be used during EMS reporting but should then be taken off speaker phone for two-way communication.

In the event radio or telephone communication is impossible to achieve, a paramedic unit may initiate life-saving medical care as under the heading Standard Orders - Emergency Situations.

Policy 8

NARCOTICS AND CONTROLLED SUBSTANCES

Medications utilized in the care of a patient:

When an ambulance crew utilizes a medication(s) the crew must document in the electronic patient care report. They may get these restocked at the Central Station.

Controlled Substance(s):

All Door County Emergency Services Personnel will abide by the Controlled Substance Policy found in the department's policy and procedure manual (#215)

Policy 9

Left Blank

No Resuscitation Indicated

Policy:

Resuscitation can be withheld in Medical Cardiopulmonary Arrest under the following circumstances:

- Adult patient >18 years of age AND
- Pulseless, Apneic and no other signs of life present AND
- Asystole verified in two (2) leads AND
- Not exposed to an environment likely to promote hypothermia AND
- The presence of one or more of the following:
 - Rigor Mortis
 - Decomposition of body tissues
 - Dependent lividity OR
 - When the patient has a valid State of Wisconsin DNR order/bracelet/wristband

If unknown DNR status or questions regarding validity of DNR status, initiate resuscitation unless directed to discontinue by OLMC.

PATIENT REFUSAL FOR MEDICAL CARE/TRANSPORT

Policy:

If the patient refuses medical care at the scene or transport to the hospital, and in the opinion of the EMT-Basic or EMT-Paramedic team and/or the medical control physician, the patient requires immediate medical attention to prevent loss of life or permanent impairment, or the patient is not competent (i.e. drug/alcohol intoxication, medically compromised, psychotic etc.) transport should be initiated. The appropriate police agency should be contacted for assistance and preparation of an EM-1.

If the patient refuses medical care at the scene or transport to the hospital, and if the treating team does not believe a loss of life or permanent impairment will result and the patient is judged competent by the team, in consultation with medical control if appropriate, then the patient will be asked to sign a release form containing the following information at a minimum:

1. Patient's name, address and age
2. Chief complaint necessitating the initial response
3. Findings of the paramedic assessment including vital signs
4. Signature of witnesses (preferably a police officer or family member)

Documentation of care should be completed for all patients signing a release.

Release forms should also be completed for transported patients refusing portions of indicated medical care (i.e. cervical spine immobilization, IV etc.). This must also be documented in the electronic patient care report.

Policy 11

PHYSICIAN ON-SCENE

When a physician is present at the scene and offers their assistance, please inform the physician of the following policy:

“Thank you for your offer of assistance. Be advised these EMT’s are operating under the authority of Wisconsin Statute Chapter 256.15 No physician or other person may intercede in patient care without the medical control physician on duty relinquishing responsibility of the scene via radio or telephone.

If responsibility is given to a physician at the scene, that physician is responsible for any and all care given at the scene of the incident and en route to the hospital and must sign the patient’s medical record.”

Allied health personnel such as nurse practitioners and PA-C’s may assist in the care of the patient to the level deemed appropriate by the EMS providers, but may not assume medical control or give orders to the EMS providers.

Exceptions*:

1. If the physician at the scene is the patient’s **attending physician, including nephrology**, the medical control physician will be consulted first before granting or refusing responsibility to that physician.
2. If the physician at the scene is an emergency physician who routinely provides on line medical direction in the Door County Emergency Services system, the on line medical control physician will be consulted first before granting or refusing responsibility to that physician.

*If either of these situations occurs, the on-scene physician may contact medical control and transfer care of the patient back to the on-line medical control physician for treatment during transfer and does not have to accompany the patient to the hospital if the on-line medical control physician agrees.

PREFERRED RADIO REPORTING FORMAT

Basic Life Support: Identify EMS unit and that you are on a “BLS Call”.

1. Age and sex of patient
2. Chief complaint
3. Brief history of present illness or mechanism of injury
4. Level of consciousness
5. Vital signs, including pulse, blood pressure and respirations
6. Pulse oximetry and/or blood glucose reading if appropriate and available
7. Any therapeutic measures performed.

Advanced Life Support: Identify EMS Unit and state “ALS call”. For all major or potential major trauma, STEMI or stroke patients contact medical control as early as allowed by patient condition and relay a brief report, including patient age, sex, mechanism of injury, current vital signs to allow for early activation of the trauma, STEMI or stroke system. A complete report should follow when the management of the patient allows. The following along with the above BLS criteria, additional pertinent information should be reported on all ALS calls:

- Presence or absence of IV/IO access
- Type of immobilization, if appropriate
- Physical Exam
- Pupillary size and response
- Respiratory Distress
- Lung Sounds
- Skin Condition
- JVD
- Pedal Edema
- Pain Scale
- Relevant past medical history
- Medications
- Allergies
- 12 lead EKG findings if appropriate
- Any therapeutic measures performed.

Restraints

Violent, agitated or potentially violent patients who are medically unable to give consent should be restrained on the cot to prevent injury to the patient or paramedics. If a patient is refusing treatment, but deemed to be a threat for loss of life or permanent impairment by the paramedic team, the appropriate police agency should be contacted, assist with restraints as needed and prepare an EM-1. Notify receiving hospital about the nature of the patient and the need to restrain so they can prepare for arrival. (Once restrained, the restraints should remain in place until the patient is seen by a physician in the emergency department.)

The following content will be considered the standard of care for the patient who needs physical restraint:

- Protect patient, family, bystanders and EMS personnel from potential harm. Obtain additional help as necessary.
- Observe universal precautions.
- Evaluate the situation to determine the need for police presence as above.
- Assure clear airway, breathing and circulatory status.
- Complete the history and secondary physical assessment.
- Assess the patient's level of consciousness, level of activity, body language and affect.
- Evaluate suicidal potential.
- Attempt to rule out common physical causes for patient's abnormal behavior and treat accordingly.
 - hypoxia
 - hypoglycemia or other metabolic disorders
 - head trauma
 - alcohol intoxication
 - substance use/abuse
- Maintain non-threatening attitude toward patient.
- Contact your hospital base station physician for medical orders as needed.
- Provide appropriate medical care as ordered.
- Complete a run report, documenting all pertinent information received, procedures ordered/completed, results of interventions and changes in the patient's condition.
- Documentation must include:
 - A description of the circumstances/behavior which precipitated the use of restraints
 - A statement that the patient/significant others were informed of the reasons for the restraints and that their application was for the safety of the patient/bystanders or personnel and not as punishment for antisocial behavior.
 - A statement that no other less restrictive measure appeared appropriate and/or other measures were tried and failed

Policy 14

Restraints Cont.

- The time of application of the restraint device
- The position in which the patient was restrained and transported
- The type of restraint used
- Guidelines for application by EMT's include:
 - Restraint equipment applied by EMS personnel must be padded, four point, soft restraints and allow for quick release.
 - Restraints must be applied in such a manner that complete monitoring of vital signs is possible.
 - Restraints must not cause vascular or neurological compromise.

NO PATIENT SHALL BE TRANSPORTED PRONE!!

- **Personnel operating within the Door County Emergency Services system may NOT use:**
 - **Hard plastic ties or any restraint device which requires a key to remove**
 - **Backboard or scoop stretcher to “sandwich” the patient**
 - **Restraints which secure the patient's hands and feet behind the back (“hog-tie”)**
 - **Any method or material applied in a manner that could cause vascular or neurological compromise.**
- For restraint devices applied by law enforcement officers:
 - The restraints and position must provide sufficient slack in the device to allow the patient to straighten the abdomen and chest to take full tidal volume.
 - An officer must be immediately available to the patient AT ALL TIMES at the scene as well as in the patient compartment of the transport vehicle.
- A left lateral lying position should be used whenever possible. The position of transport may not compromise respiratory or circulatory systems and must not interfere with necessary medical treatment. Patients should not be transported in a prone position.
- Restrained extremities should be evaluated for pulse quality, capillary refill time, color, nerve and motor function every 15 minutes. Restraints must be adjusted if compromise of any of these functions is discovered.
- Document reasons for any deviation from protocol on an Incident Report form.

Policy 14

Service Dog

This policy is designed to guide personnel to facilitate a service animal that would be required to accompany a patient. The only animal recognized as a service animal is a dog. A service dog should be registered and most will be identified by a collar or vest but are not required to have any identifier on them.

What is a service animal?

Under Americans with Disabilities Act (ADA) a service animal is defined as a dog that has been individually trained to do work or perform tasks for an individual with disabilities. The task(s) performed must be directly related to the person's disabilities.

When it is not obvious what the service dog provides, personnel may ask:

- Is the service dog required because of disability?
- What work or tasks has the dog been trained to perform?

Personnel are NOT to ask the following regarding a service dog:

- About the person's disability
- For documentation as proof that the dog has been trained, certified or licensed before accepting it as legitimate service dog

Must a service animal be allowed to ride in the ambulance with its handler?

Generally, yes. However, if the space in the ambulance is crowded and the dog's presence would interfere with the emergency medical staff's ability to treat the patient, staff should make other arrangements to have the dog transported to the hospital.

Personnel can refuse transport of a service dog for any of the following reasons:

- If the service dog will "fundamentally alter" the personnel's ability to provide lifesaving care
- The service dog is out of control and doesn't take effective action to correct it
- The service dog isn't "house broken." (term and definition used in the ADA documentation)

The patient is required to maintain control of the service dog at all times. This means that the dog must be harnessed, leashed or tethered, unless it interferes with the service dog's work or the patient's disability. In that case the patient must maintain control of the service dog through voice, signal or other effective controls.

When the patient is unconscious or in a condition requiring critical lifesaving treatment and the service dog's presence would compromise the care or safety during transport, it is best to make other arrangements of transport for the service dog. Revert care of service dog to respective law enforcement or contact on-duty supervisor.

**** Source: U.S. Department of Justice, Civil Rights Division, Disability Rights Section ****

SEXUAL ASSAULT

The treatment of injuries is the primary care objective in potential sexual assault cases. Sexual Assault patients should be transported preferentially to Door County Medical Center for evaluation by a Sexual Assault Nurse Examiner. If the patient requests transfer to a different facility, patient choice should be honored.

Observe the following in treatment:

1. Do not clean the patient up or allow the patient to wash
2. Do not question the patient concerning the incident
3. Avoid cutting clothing. If clothing is removed, it should be placed in separate paper bags.

Termination of 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:

Note: When asystole is seen on the cardiac monitor, confirmation of the rhythm shall include a PRINTED rhythm strip, as well as documented interpretation of the rhythm strip in more than one lead. Low amplitude V-fib or PEA may be difficult to distinguish from asystole when using only the cardiac monitor display for interpretation.

Procedure:

1) Discontinuation of CPR and ALS intervention may be implemented by a Paramedic without Medical Control consultation in a non-hypothermic adult provided all following criteria exist:

- Initial rhythm is Asystole or PEA, confirmed in two leads on a printed strip
- Terminal rhythm is asystole confirmed in two leads on a printed strip
- Advanced airway (King LTD or ETT) confirmed by digital capnography (ETT/NVA)
- At least three doses of Epinephrine have been administered
- Cardiac Arrest refractory to minimum of 20 minutes of ACLS
- Quantitative EtCO₂ value is <10mmHg with effective CPR, after 20 minutes of ACLS
- Absence of ROSC (Return of Spontaneous Circulation) throughout resuscitation efforts.

2) Field termination if the above criteria aren't met after 20 minutes of ACLS must be approved by Medical Control.

3) The paramedic has the discretion to **continue** resuscitation efforts if scene safety, location, patient's age, time of arrest, or bystander input compels this decision.

Documentation of Vital Signs

Policy:

Every patient encounter by EMS shall 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 in the patient care report (PCR) for any patient who receives any assessment component.

To ensure:

- Objective evaluation of every patient's general clinical 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 (cap refill may be substituted in children < 3)
- 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, complaint, and protocol used, vital signs may also include: Pulse Oximetry, Temperature, End Tidal CO₂, Breath Sounds, and Level of Response

4. If the patient refuses evaluation, an assessment of capacity and a patient disposition must be documented in the electronic patient care report. In addition, providers should record any vital signs that the patient or situation allows (e.g. a respiratory rate may be obtained by observation alone), and include an explanation of the clinical situation and refusal in the PCR narrative.

5. When any components of vital signs were obtained using the cardiac monitor, the data should be exported electronically to the PCR. Where values are inconsistent with manually obtained values, values may be appropriately edited to reflect the manually obtained values.

6. Document situations that preclude the evaluation of a complete set of vital signs. Generally, children > 3 years of age should have a BP measured, and cap refill measured for < 3 years of age. For young children, the need for BP measurement should be determined on a case by- case basis considering the provider's rapport with the child and the child's clinical condition. Blood pressure measurement is not required for all patients, but should be measured if possible, especially in critically ill patients in whom blood pressure measurement may guide treatment decisions.

7. Record the time vital signs were obtained; any abnormal vital sign should be repeated and monitored closely.

Policy 18

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

General Approach

Scene Safety
 -Bring all necessary equipment to patient's side
 -Demonstrate professionalism and courtesy

Be sure proper PPE is donned
 (contact, droplet, airborne)

E Initial Assessment
 BLS Maneuvers
 Consider Spinal Protection
 Procedure [Page 261](#) **E**

Adult-Airway Protocol [Page 30](#)

Vital Signs
 BP, pulse, resp. rate at least every 15 minutes
 Temperature if pt. with hx fever or hot to touch.

Consider Supplemental O2

B Consider 12 Lead EKG and/or
 Cardiac Monitor and/or EtCO2 **B**

Most Appropriate Protocol

MC Exhausted Standing Protocols?
 Consult Medical Control **MC**

If in Cardiac Arrest

Cardiac Arrest Protocol
[Page 40](#)

Pearls

RECOMMENDED EXAM: Vital signs, mental status with GCS and location of injury or complaint.....then to specific protocol

12 Lead EKG should be done EARLY on a possible STEMI patient.

- Vital signs include: Blood Glucose Reading – if any weakness, altered mental status or history of diabetes.
- Oxygen Saturation and Capnography if condition warrants
- Nothing by mouth, unless patient is a known diabetic with hypoglycemia and able to self-administer oral glucose paste or a glucose containing beverage or unless indicated by specific protocol.
- If evidence of dehydration or BP<90mmHg systolic administer 250ml 0.9% NaCl and refer to appropriate protocol. If hypoglycemic refer to diabetic emergency protocol.
- Any patient contact which does not result in an EMS transport must have a completed refusal form.
- Required vital signs on every patient include blood pressure, pulse, respirations, pain-severity.
- Pulse oximetry and temperature documentation is dependent on the specific complaint
- Timing of transport should be based on the patient's clinical condition and the transport policy.
- Never hesitate to consult medical control for patient who refuses
- Orthostatic vital sign procedure should be performed in situation where volume status is in question.

General Protocol

General Approach

History

- Location
- Onset
- Duration
- Quality
- Radiation
- Severity
- Precipitating events
- Modifying factors
- Associated symptoms
- S-A-M-P-L-E
- Past Medical/Surgery
- Family
- Social

Exam:

- Primary Assessment
- Airway
- Breathing
- Circulation
- Disability
- Expose
- Secondary Assessment
- HEENT
- Respiratory
- Cardiovascular
- Abdomen
- Extremities
- Neuro

Differential:

- Vascular
- Infectious/Inflammatory
- Trauma/Toxins
- Autoimmune
- Metabolic
- Idiopathic
- Neoplastic
- Congenital

Emergency Medical Responder

- Scene Safety
- PPE (consider contact, droplet, and/or airborne)
- Initial assessment (BLS maneuvers and consider c-spine immobilization)
- Establish patent airway
- Provide Supplemental oxygen to maintain SpO₂ ≥ 92 %, or if any respiratory signs or symptoms present
- Obtain, record and monitor vital signs

Basic-Perform/Confirm All Above Interventions

- Blood Glucose procedure if indicated
- Perform cardiac monitoring
- Perform a 12-lead ECG if chest pain, abdominal pain above the umbilicus or ischemic equivalent symptoms

A-EMT-Perform/Confirm All Above Interventions

- Refer to Airway-Adult Protocol [Page 30](#) if indicated
- IV Protocol [Page 104](#) if needed

Contact Medical Control with any questions or additional orders

General Approach

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

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

Emergency Incident Rehab

Remove Any of the Following:

- PPE
- Body Armor
- Chemical Suits
- SCBA
- Turnout Gear
- Other Specific Equipment

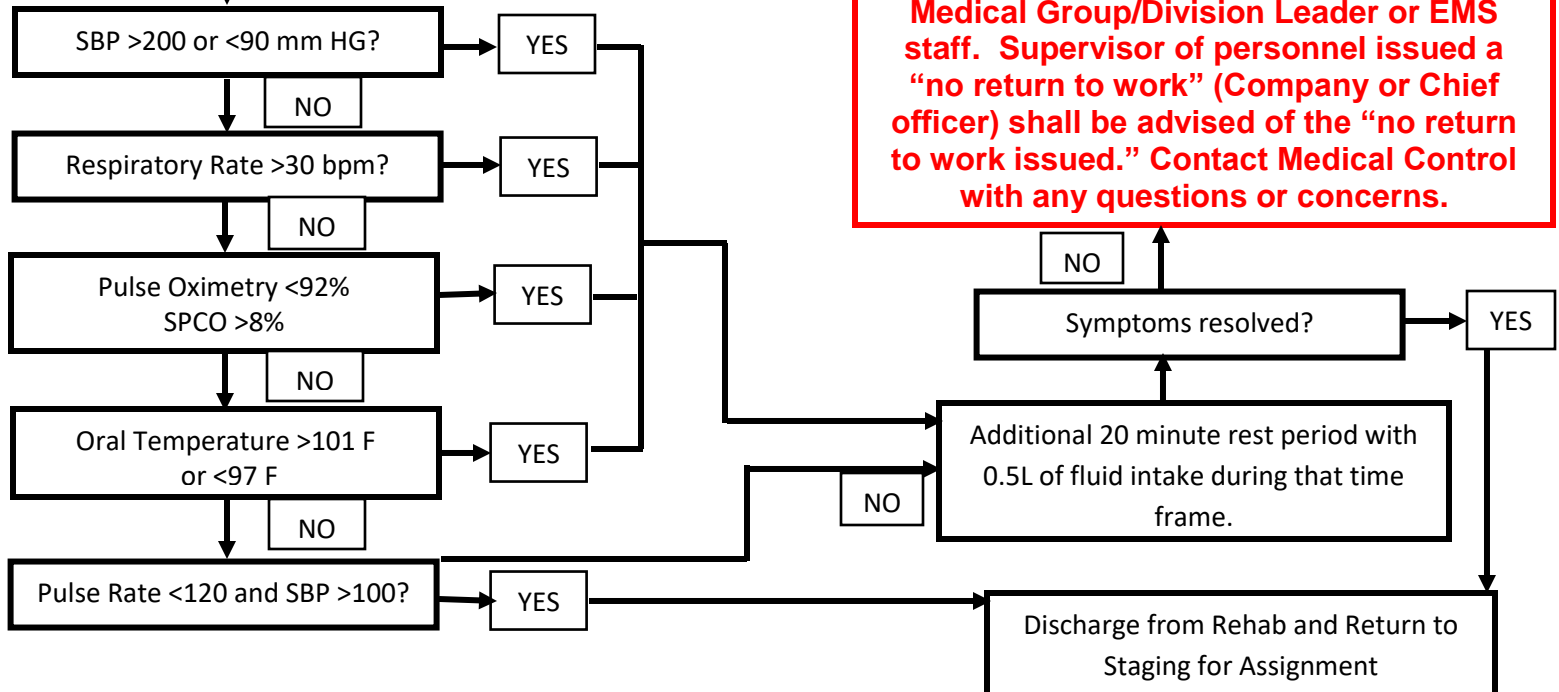
Automatic Transport Criteria

- Chest Pain
- Confusion
- Shortness of Breath
- Palpitations or Irregular Heart Beat Sensations

E	General Approach Protocol	E
E	Pulse Ox Procedure	E
E	Temperature Procedure	E
E	Obtain SPCO if capable	E

20 minute rest period for all personnel in Rehab.
Minimum of 0.5 L of fluid intake during the 20 minute timeframe.

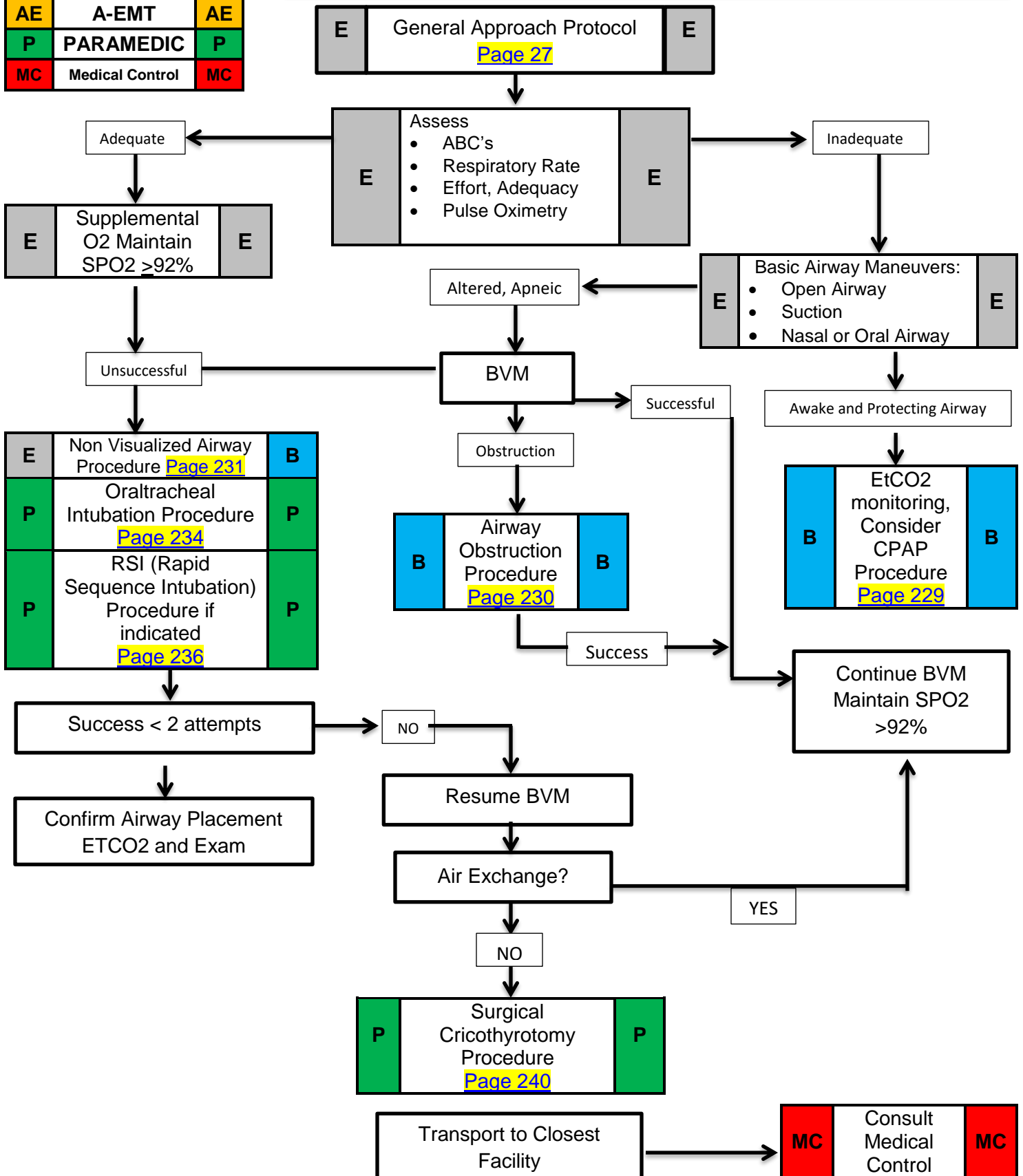
Further evaluation and reference to specific protocol should be initiated. If personnel refuses transport, a "no return to work" for the incident may be issued by Medical Group/Division Leader or EMS staff. Supervisor of personnel issued a "no return to work" (Company or Chief officer) shall be advised of the "no return to work issued." Contact Medical Control with any questions or concerns.



Emergency Incident Rehab

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Airway-Adult



Airway-Adult

Emergency Medical Responder

- General Approach Protocol
- Supplemental oxygen to maintain $SPO_2 \geq 92\%$
- If suspicion of trauma, maintain C-spine protection.
- Suction all debris, secretions from the airway if necessary
- If patient does not respond to above measures or deteriorates consider advanced airway (King LTD) placement [Page 231](#)

Basic-Perform/Confirm All Above Interventions

- Refer to CPAP Procedure if indicated [\(Page 229\)](#)
- Perform Basic Airway Maneuvers: open airway, nasal/oral airway; BVM if needed.
- BVM:
 - Ventilate once every 5-6 seconds (10-12 times/minute)
- If signs of airway obstruction refer to Airway Obstruction Procedure [\(Page 230\)](#)
- If patient does not respond to above measures or deteriorates consider advanced airway placement [Page 231](#)
- Monitor oxygen saturation and end-tidal CO₂ continuously

Paramedic-Perform/Confirm All Above Interventions

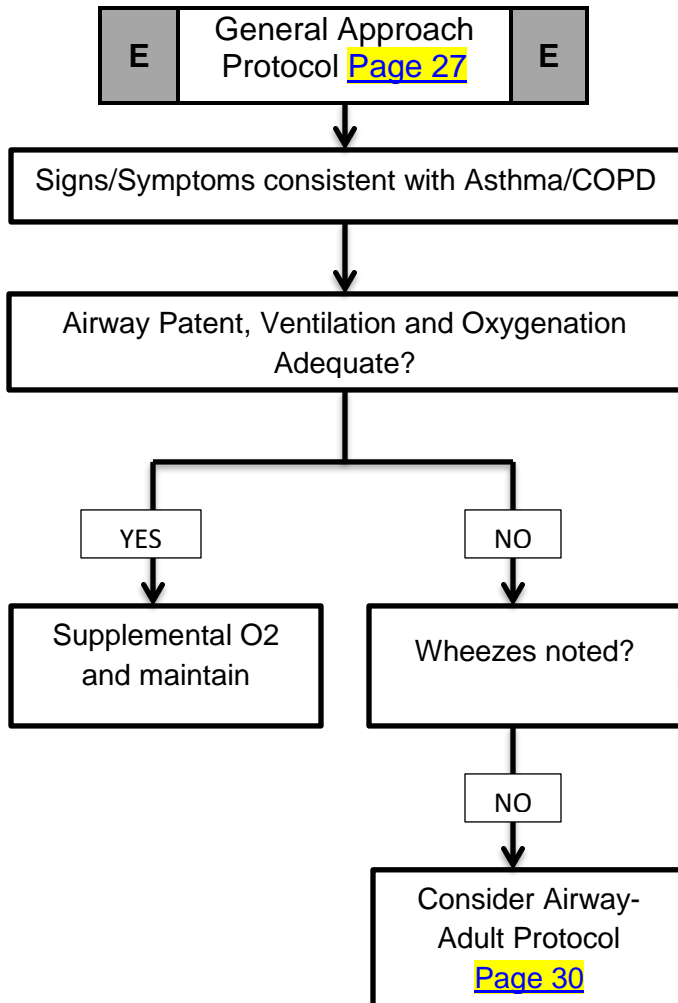
- Follow algorithm if invasive airway intervention is needed (Non Visual Airway/ETT):
 - Apnea
 - Decreased level of consciousness with respiratory failure (i.e. hypoxia [O₂ sat < 93%] not improved by 100% oxygen, and/or respiratory rate < 8)
 - Poor ventilatory effort (with hypoxia not improved by 100% oxygen)
 - Unable to maintain patent airway
 - Follow appropriate procedure (Video Laryngoscopy, King LTS-D, Direct Laryngoscopy, etc) [\(Pages 231,234,241\)](#)
- Following placement of the ETT/Non Visual Airway confirm proper placement:
 - Observe for presence of alveolar waveform on capnography
 - Assess for absence of epigastric sounds, presence of breath sounds, and chest rise and fall
 - Record tube depth and secure in place using a commercial holder if applicable
- Refer to Rapid Sequence Intubation Procedure if indicated [\(Page 236\)](#)
- Refer to Surgical Cricothyrotomy if indicated [\(Page 240\)](#)

Contact Medical Control for any additional questions or orders.

Airway-Adult

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Airway-Asthma/ COPD



B	Consider CPAP Procedure Page 229	B
B	Albuterol 2.5mg & Ipratropium 0.5 mg	B
B	Repeat Albuterol 2.5mg PRN	B
P	Consider Xopenex 1.25 mg	P
B	Consider in line neb w/ CPAP	B
B	12 Lead Procedure Page 225	B
AE	IV Protocol Page 104	P
MC	Contact Medical Control for the consideration of administering either of the following two medications	MC
B	Epinephrine 1:1000 0.3 mg IM (Use caution in patients >50 yrs of age, hx of CAD and cardiac hx)	B
P	Magnesium Sulfate 2g in 100 mL NS IV over 10 minutes	P

Airway-Asthma/ COPD

Airway-Asthma/ COPD

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 full sentences
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Fever, cough

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.)

Emergency Medical Responder

- General Approach Protocol [Page 27](#)
- Assess lung sounds
- Supplemental oxygen to maintain SPO2 \geq 92%

Basic-Perform/Confirm Above Interventions

- Consider CPAP [Page 229](#) if available and symptoms are moderate to severe
 - If history of Asthma or COPD, Start at 5cm of H2O and titrate up to maximum 10 cm of H2O for effect
- **Albuterol (Proventil) 2.5 mg/3 ml** and **Ipratropium Bromide 0.02% (Atrovent) 0.5 mg/2.5 ml** via nebulizer if wheezing or history of Asthma/COPD. Albuterol may be repeated to a maximum of 3 administrations.
- 12 Lead EKG Procedure [Page 225](#) if indicated
- If symptoms Severe (not speaking, little or no air movement) consider:

Contact Medical Control for the consideration of administering Epinephrine 1:1000, 0.3 mg IM if available. Use caution in patients >50 yrs of age or history of CAD

A-EMT-Perform/Confirm Above Interventions

Paramedic-Perform/Confirm Above Interventions

- IV Protocol [Page 104](#)
- Observe for signs of impending respiratory failure: Refer to Airway-Adult Protocol ([Page 30](#)) if indicated:
 - Hypoxia (O2 sat < 90%) not improved with 100% O2
 - Poor ventilatory effort
 - Altered mental status/decreased level of consciousness
 - Inability to maintain patent airway
 - Paramedic **ONLY**: Consider Xopenex 1.25 mg/3 ml via nebulizer.

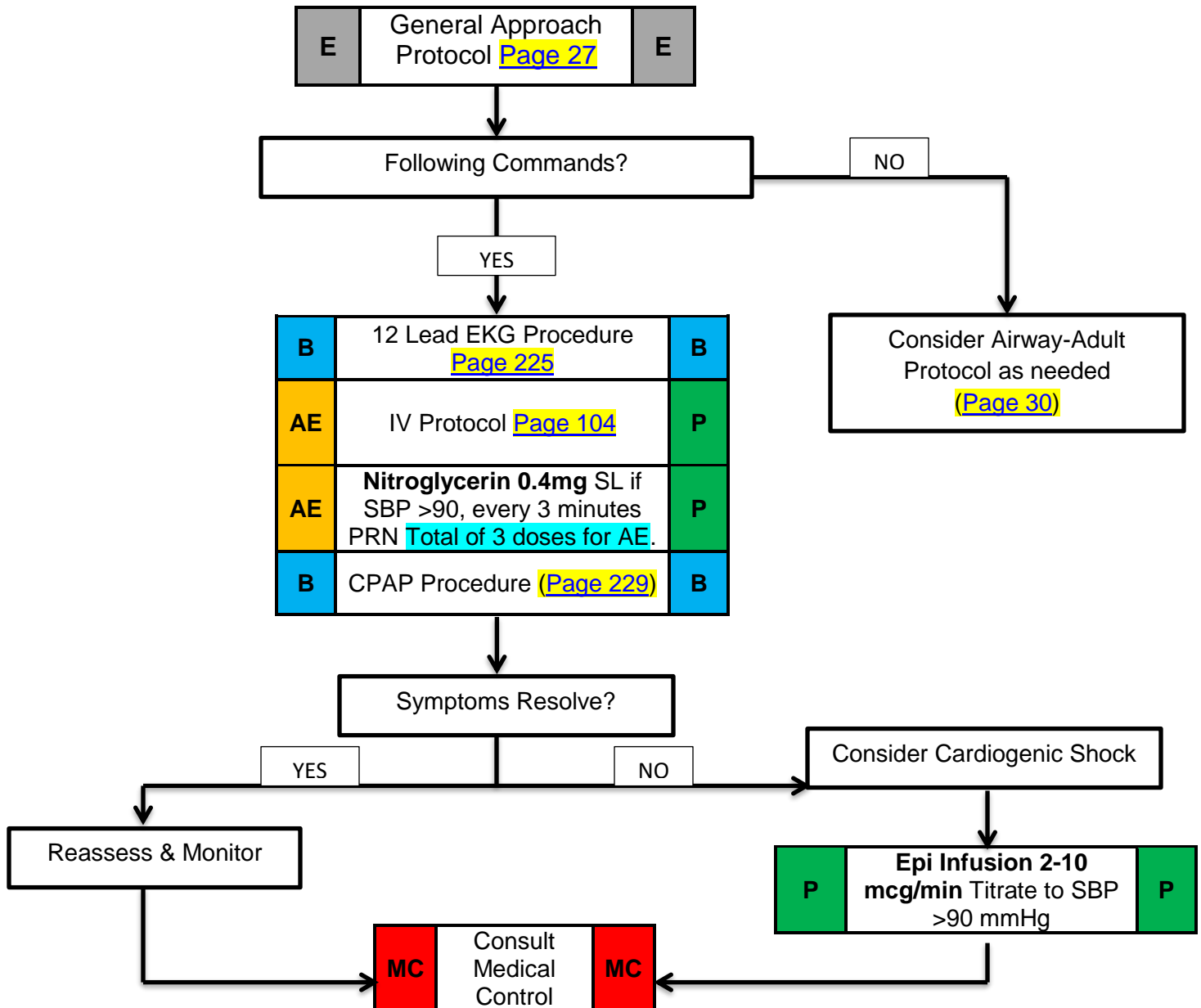
Contact Medical Control for the consideration of administering Magnesium Sulfate. 2 g IV in 100 mL of NS over 10 minutes.

****DO NOT use Magnesium Sulfate in patients with a history of Renal Failure****

Airway-Asthma/ COPD

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Airway-CHF/ Pulmonary Edema



Airway-CHF

Airway-CHF

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

Emergency Medical Responder

- General Approach Protocol [Page 27](#)
- Supplemental oxygen to maintain $\text{SPO}_2 \geq 92\%$

Basic-Confirm/Perform All Above Interventions

- Consider CPAP ([Page 229](#)) if available and symptoms are moderate to severe
 - If history of Asthma or COPD, Start at 5cm of H₂O.
- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Confirm/Perform All Above Interventions

- IV Protocol [Page 104](#)
- **Nitroglycerin 0.4 mg SL** every 3 min:
 - Contraindicated if SBP <90 mmHg
 - within last 24 hours (Viagra, Levitra); 48 hours (Cialis)

Paramedic-Confirm/Perform All Above Interventions

- Observe for signs of impending respiratory failure: Refer to Airway-Adult Protocol if indicated:
 - Hypoxia (O_2 sat < 90%) not improved with 100% O_2
 - Poor ventilatory effort
 - Altered mental status/decreased level of consciousness
 - Inability to maintain patent airway
- For Hypotension (systolic BP <90 mmHg):
 - Consider **Epi infusion at 2-10 mcg/min** titrated to maintain SBP >90 mmHg [Epi chart/page 291](#)

Airway-CHF

Airway-Rapid Sequence Intubation & Rapid Sequence Airway

Airway, Adult Protocol Unsuccessful

Preparation (T-8 minutes)
IV/IO, EKG, SPO2, BP
Functioning Laryngoscope, BVM, O2, ETT, Rescue Airway, Suction, ETCO2
Meds drawn and labeled (including post procedure sedation)

PreOxygenate (T-5 minutes)
100% O2 x 5 minutes or 8 vital capacity breaths with 100% O2

PreTreatment (T-2 minutes)
Evidence of Head Injury- **Lidocaine 1.0 mg/kg IV/IO (max 150 mg)**
All patients <12-**Atropine 0.02 mg/kg IV/IO (minimum 0.1 mg)**

Paralysis & Induction (T-0)
a. **Ketamine 1 mg/kg IV/IO over 1 minute or Versed - 2 mg IV/IO over 1 minute**
b. **Succinylcholine 2 mg/kg**

PLACEMENT with PROOF (T+30 seconds)
Place NVA/ETT, Confirm with: End Tidal CO2, Waveform, Auscultation, Physical findings
Secure device, note position

Successful

Unsuccessful

POST-PLACEMENT MANAGEMENT (T+1 minute)
Rocuronium 1mg/kg IV/IO
Fentanyl 50 mcg IV/IO
After 30 minutes re-sedate **Versed 2mg IV/IO**

Use **VERSED 2 mg IV/IO** when Ketamine is relatively contraindicated.

*Severe Hypertension with cardiac history
*Pregnancy
*Consider the use of versed in a patient in status epilepticus
*Versed may be utilized for continued sedation

Continue BVM
Maintain SPO2

Refer to Airway-Surgical
Cricothyrotomy
Procedure if indicated

MC	Consult Medical Control	MC
----	-------------------------------	----

Airway-Rapid Sequence Intubation & Rapid Sequence Airway

Airway-Rapid Sequence Intubation (RSI) & Rapid Sequence Airway

P

Double Paramedic Procedure (requires 2 Paramedics by patients side during procedure)

P

To facilitate oral endotracheal intubation of a patient when attempts without muscle relaxation are not successful and the airway cannot be adequately protected.

Indications (Possible Candidates for RSI):

- GCS <8 (decreased LOC)
- Potential for airway compromise
- Head-injured patients with airway compromise
- Status epilepticus not responding to anticonvulsants
- Patients unable to protect airway (trauma, CVA, obstruction, overdose, anaphylaxis, etc.)
- Severe Respiratory Distress (COPD, asthma, burns, etc.)
- Insufficient respirations (pulse ox. <85%, shallow respirations, cyanosis, air hunger, etc.)
- Patients with a defined salvage airway plan (BVM, supraglottic airway, or surgical airway)

Contraindications:

- Known allergy to necessary medications
- Suspected epiglottitis, edema, or retropharyngeal edema
- Severe oral, mandibular, or anterior neck trauma
- Conscious patient (with stable hemodynamics) who is maintaining an impaired airway
- Age less than 2 years old
- Significant hypotension, including profound shock states
- Cricothyrotomy contraindicated (potential contraindication)

PREPARATION: (T-8 minutes, requires 2 Paramedics):

1. Assumes oral intubation and failed airway equipment preparation (functioning laryngoscope, BVM, O₂, ETT, rescue airway, suction, ETCO₂)
2. Pre-oxygenate with 100% O₂ (initially NRB mask or NC, then BVM only if needed), avoid hyperventilation
3. Meds drawn and labeled (including post procedure sedation)

PREOXYGENATE: (T-5 minutes)

1. 100% O₂ for 5 minutes via NRB or 8 vital capacity breaths with 100% O₂ via BVM

Airway- Rapid Sequence Intubation & Rapid Sequence Airway

Airway-Rapid Sequence Intubation (RSI) & Rapid Sequence Airway Cont.

PRETREATMENT: (T-2 minutes):

1. **All suspected head injured patients - LIDOCAINE 1.0 mg/kg IV/IO.**
Reduces cardiovascular and intracranial pressure responses to intubation
2. **All patients age <12 - ATROPINE 0.02 mg/kg IV/IO** (minimum dose 0.1 mg, max dose 1.0 mg).
Blunts bradycardia from vagal stimulation caused by laryngoscopy or the administration of succinylcholine. Pre-procedure dose especially important in pediatrics.

PARALYSIS and INDUCTION: (T-0 minutes, Intubation begins):

1. Ketamine (ketalar): Dissociative anesthetic causing sedation and analgesia.
 - a. For use in patient requiring emergent intubation that Ketamine is not contraindicated.
 - b. May also consider for patients requiring intubation secondary to asthma.
 - i. **Adult: 1 mg/kg IV/IO over 1 minute**
 - ii. **Pediatric: 1 mg/kg IV/IO over 1 minute**

Use VERSED when Ketamine is relatively contraindicated. **Examples include:

- **Severe Hypertension with cardiac history**
- **Pregnancy**
- **Consider the use of versed in a patient in status epilepticus**
- **Versed may be utilized for continued sedation**

OR

2. **Versed (midazolam):** Short-acting benzodiazepine causing sedation and analgesia.
 - a. **Adult- 2 mg IVP, may repeat one time if inadequate sedation obtained.**
 - b. **Pediatric- 0.35 mg/kg up to total dose of 2 mg.**
3. **SUCCINYLCHOLINE (Anectine):** Depolarizing neuromuscular blocking agent which provides short term paralysis in order to facilitate intubation. Onset within 30-90 seconds all protective reflexes will be absent (gag, cough, and swallow.)
 - **Adult: 2.0 mg/kg IV/IO**
 - **Pediatric: 2.0 mg/kg IV/IO******Succinylcholine is contraindicated in cases of neuromuscular disease, such as ALS, Myasthenia Gravis, and Guillain-Barre**

Airway-Rapid Sequence Intubation & Rapid Sequence Airway

Airway-Rapid Sequence Intubation (RSI) & Rapid Sequence Airway Cont.

PLACEMENT: (T+30 seconds)

1. Intubate by ETT or NVA orally at adequate paralysis/relaxation (usually 1.5- 2.0 min.)
2. Ventilate manually and confirm tube placement with bilateral anterior and axillary breath sounds, and absence of gastric sounds. Utilize a secondary means of confirmation, such as the EDD or EtCO₂. Secure the tube.
3. If unable to intubate after neuromuscular blockade (NMB), continue BVM ventilations with 100% O₂ and proceed to placement of salvage airway device (i.e. NVA or surgical airway). Surgical airway is indicated if endotracheal intubation and previous salvage airway attempts fail.

POST-PLACEMENT: continued sedation/analgesia/paralysis (T+ 1 minute after procedure)

1. Continue paralysis with **ROCURONIUM**
 - Loading dose of **1 mg/kg** is needed.
 - Give additional dose every 30 minutes, or as directed by medical control.
2. Re-sedate after 30 minutes or as needed with **VERSED**
Adult - 2.0 mg IV/IO. Pediatric - 0.1 mg/kg IV/IO (minimum dose 0.1mg) up to a single dose of 2 mg over 2 minutes (~ 1 mg for 10 kg pt)
3. Continued analgesia with **FENTANYL 50mcg IV/IO** every 30 minutes, or as directed by medical control
4. Continuously re-assess the patient's airway status, vital signs, pulse oximetry, ETCO₂, and sedation levels.

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Cardiac Arrest

E	General Approach Protocol	E
	Page 27	

Criteria for Death/ No Resuscitation Indicated?

YES

No Resuscitation Indicated Policy
[Page 15](#)

NO

Adequate Bystander CCR or CPR?

NO

YES

Perform continuous compressions until defib pads are placed and monitor is charged ready to deliver shock

Immediately perform uninterrupted compressions at a rate of 100 compressions per minute for 2 minutes

Stop compression for rhythm analysis (5 seconds)

If VT or VF (or AED advises shock) Defibrillate.

If PEA/ Asystole (No Shock Advised) DO NOT SHOCK

Go to appropriate Protocol and resume compressions

AT ANY TIME Return of spontaneous circulation – Go to Post Resuscitation Protocol [Page 62](#)

Cardiac-Cardiac Arrest

Cardiac Arrest

History:

- Events leading to arrest
- Estimated downtime
- Past Medical History
- Medications
- Existence of terminal illness
- Signs of lividity, rigor mortis
- DNR

Signs and Symptoms

- Unresponsive
- Apneic
- Pulseless

Differential

- Medical or Trauma
- Vfib vs Pulseless Vtach
- Asystole
- Pulseless electrical activity
- (PEA)

- **CCR is indicated in ADULT patients that have suffered cardiac arrest of a presumed cardiac nature. It is not indicated in those situations where other etiologies are probable (overdose, drowning, hanging etc.). In these instances CPR is indicated.**
- **Successful resuscitation requires planning and clear role definition.**
- **In the event a patient suffers cardiac arrest in the presence of EMS (EMS witnessed Cardiac Arrest), the absolute highest priority is to apply the AED/Defibrillator and deliver a shock immediately if indicated.**
- **Reassess airway frequently and with every patient move.**
- **DO NOT INTERRUPT CHEST COMPRESSIONS!**

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach Protocol
- Check responsiveness and check for a carotid pulse
- If adequate bystander compressions ongoing, continue compressions until monitor pads in place and monitor charged. Stop compressions for rhythm analysis (< 5 sec)
- If VT or VF (or AED Advises Shock), defibrillate
- If PEA/Asystole, go to appropriate protocol and resume compressions
- Immediately after defibrillation, resume chest compressions with a different operator compressing. Do not pause for post-shock rhythm analysis. Stop compressions only for signs of life (patient movement) or rhythm visible through compressions on monitor or pre-defibrillation rhythm analysis every 2 minutes
- If compressions are not being performed upon arrival or if compressions are not deemed adequate, immediately perform compressions at a rate of 100 compressions per minute for 2 minutes.

A-EMT-Perform/Confirm All Above Interventions

- Consider IV Protocol [Page 104](#)

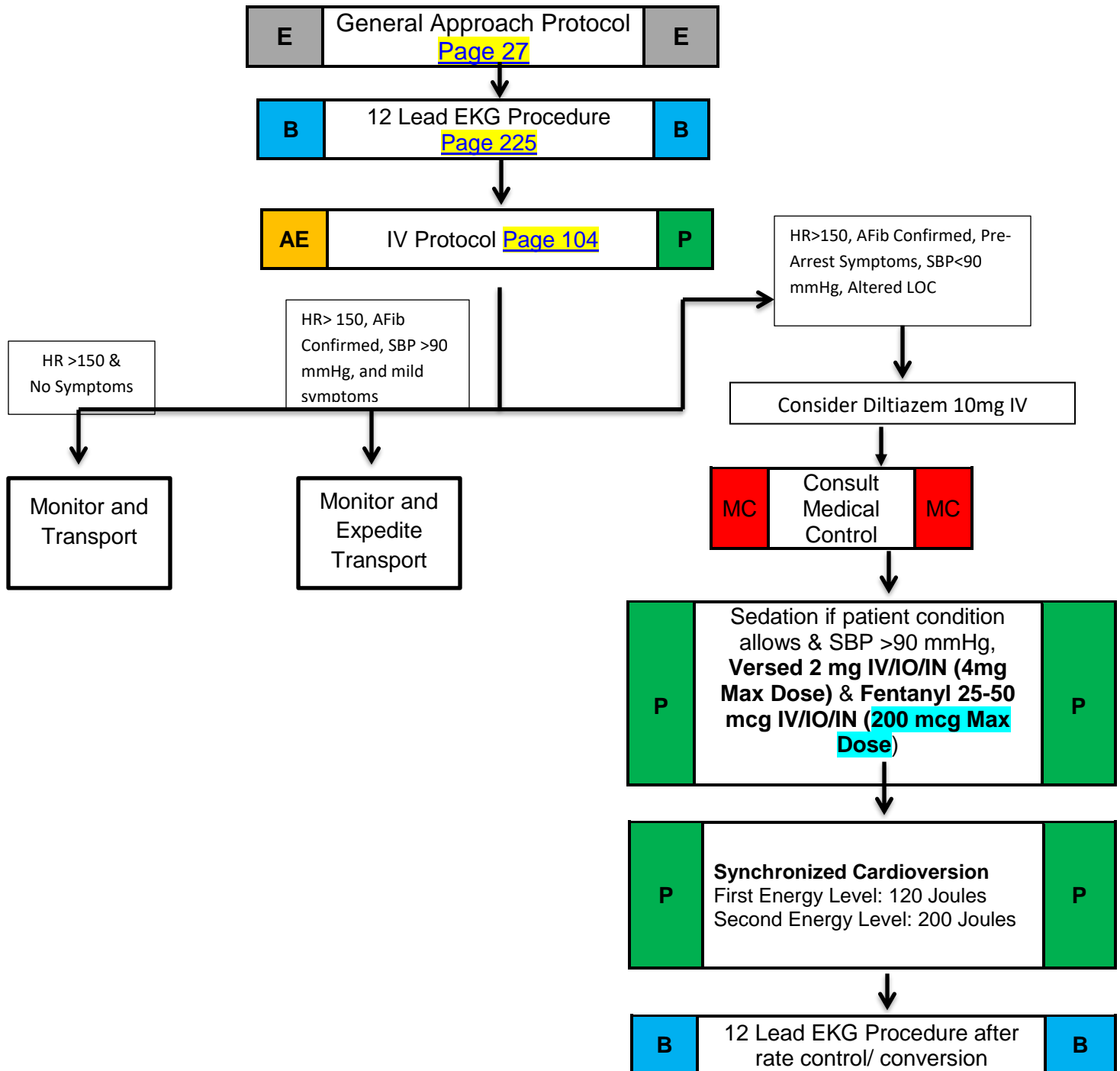
Paramedic-Perform/Confirm All Above Interventions

- Refer to respective Cardiac Rhythm Protocol
- Refer to No Resuscitation Policy ([Page 15](#)) or Termination of Resuscitation Policy ([Page 23](#)) if indicated
- If ROSC (Return of Spontaneous Circulation) refer to Cardiac- Post Resuscitation Protocol [Page 62](#)

Cardiac-Cardiac Arrest

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Atrial Fibrillation or Flutter



Cardiac-Atrial Fibrillation or Flutter

Cardiac-Atrial Fibrillation or Flutter

History:

- Medications
- (Aminophylline, diet pills,
- thyroid supplements,
- decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations/heart racing

Signs and Symptoms

- Tachycardia
- QRS <0.12 sec
- Dizziness, CP, SOB
- Potential presenting rhythm
- Sinus tachycardia
- Atrial fibrillation/flutter
- Multifocal atrial tachycardia

Differential

- Heart Disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial Infarction
- Electrolyte imbalance
- Exertion, pain, emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / OD (see HX)
- Hyperthyroidism
- Pulmonary embolus

Emergency Medical Responder

- General Patient Care Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

Stable

- HR > 150
- No Symptoms

Monitor and Transport

Borderline

- HR >150
- A-Fib confirmed
- SBP >90 mmHg
- mild symptoms i.e. CP, SOB, light headedness
- Consider administration of 10 mg of Diltiazem, may give a second dose (additional 10 mg after 15 min)

Monitor and Expedite Transport

Cardiac-Atrial Fibrillation or Flutter

Cardiac-Atrial Fibrillation or Flutter

Contact Medical Control for Unstable A-Fib or A-Flutter for discussion of the following treatments

Unstable

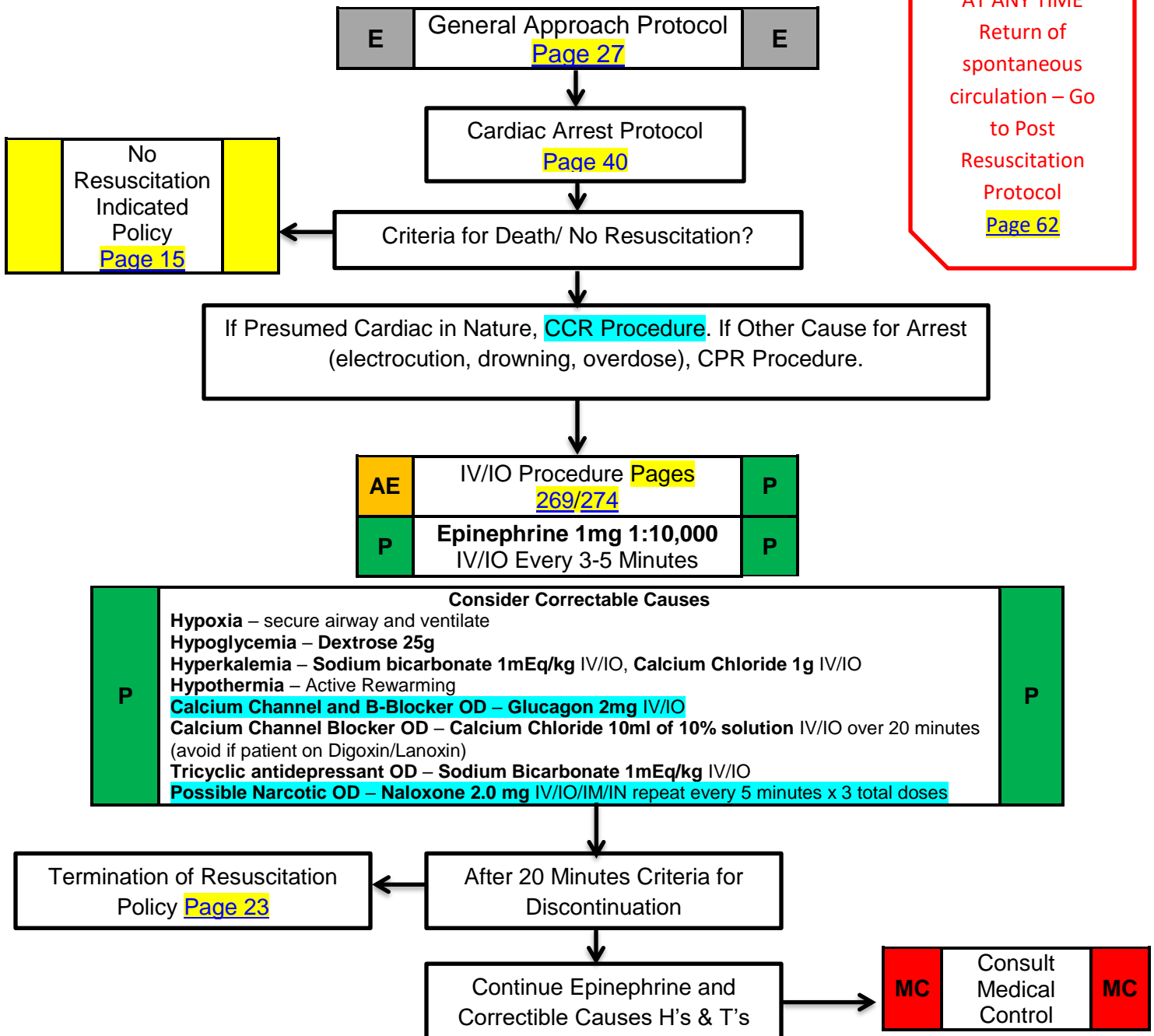
- HR >150
- A-Fib confirmed
- Pre-Arrest Symptoms
- SBP < 90 mmHg
- Altered LOC
 - Sedation if patient condition and time allows (hold if SBP <90mmHg):
 - **Fentanyl 25-50 mcg and Midazolam 2 mg IV/IO**
 - Titrate to maximum **total dose of Fentanyl 200 mcg** and **Midazolam 4 mg**
 - Synchronized Cardioversion
 - 1st energy level: 120 Joules
 - If no response: 200 Joules
- 12 Lead EKG Procedure after rate control/ conversion

Cardiac-Atrial Fibrillation or Flutter

Left Blank

Cardiac-Asystole

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC



Cardiac-Asystole

Cardiac-Asystole

History:

- Past Medical History
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected Overdose

Signs and Symptoms

- Pulseless
- Apneic
- No electrical activity on ECG
- No auscultated heart tones

Differential

- Medical or Trauma
- Hypoxia
- Potassium (hypo/hyper)
- Drug Overdose
- Acidosis
- Hypothermia

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach Protocol [Page 27](#)
- Cardiac Arrest Protocol [Page 40](#)
- If presumed cardiac in nature, [CCR Procedure Page 245](#). CPR Procedure for all other arrests (drowning, electrocution, overdose, etc.)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- Consider and treat possible causes
- If indicated refer to No Resuscitation Indicated Policy [Page 15](#)

Potential Causes of Asystole	Treatment
<ul style="list-style-type: none"> • Hypoxia 	<ul style="list-style-type: none"> • Secure airway and ventilate
<ul style="list-style-type: none"> • Hypoglycemia 	<ul style="list-style-type: none"> • Dextrose 25g IV/IO; repeat as needed to achieve blood glucose >60 mg/dL
<ul style="list-style-type: none"> • Hyperkalemia (end stage renal disease) 	<ul style="list-style-type: none"> • Sodium Bi-Carb 1 mEq/kg IV/IO • Calcium Chloride 10ml of 10% IV/IO
<ul style="list-style-type: none"> • Hypothermia 	<ul style="list-style-type: none"> • Active Re-warming
<ul style="list-style-type: none"> • Tablets (drug overdose) 	<ul style="list-style-type: none"> • See below

- **Epinephrine 1 mg** 1:10,000 IV/IO every 3-5 min during arrest
- Drug overdoses (see specific drug OD/toxicology section)
- **Glucagon 2 mg IV/IO** for calcium channel and B-blocker OD
- **Calcium Chloride 10ml of 10% solution IV/IO** over 20 minutes for calcium channel blocker OD
 - Avoid if patient on Digoxin/Lanoxin
- **Sodium Bicarbonate 1 mEq/kg**, IV/IO for Tricyclic antidepressant OD
- **Naloxone (Narcan) 2.0 mg IV/IO/IM/IN repeat every 5 minutes x 3 total doses** for possible narcotic OD
- If no response to resuscitative efforts in 20 minutes consider discontinuation of efforts (see **Termination of Resuscitation Policy** [Page 23](#))

Cardiac-Asystole

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Bradycardia (HR <60)

E	General Approach Protocol	E
	Page 27	



B	12 Lead EKG Procedure	B
	Page 225	



AE	IV Protocol	P
	Page 104	



Hypotension – SBP <90mmHg		
---------------------------	--	--

Stable

AE	IV NS Bolus 500mL	P
----	-------------------	---

Unstable



P	Altered Mental Status or Chest Pain	P
---	-------------------------------------	---



P	Atropine 0.5mg IVP, repeat every 3 minutes as needed (Max 3.0 mg)	P
---	--	---

Patient Unstable?



P	External Cardiac Pacing Procedure Page 257	P
P	Sedation if patient condition allows & SBP >90 mmHg, Versed 2 mg IV/IO/IN (4mg Max Dose) & Fentanyl 50 mcg IV/IO/IN (200 mcg Max Dose)	P

No Improvement?

P	Epinephrine Infusion or Epi Push Dose Pressor 2-10 mcg/min titrate to SBP >90	P
---	---	---



MC	Consult Medical Control	MC
----	-------------------------	----

Cardiac-Bradycardia

Cardiac-Bradycardia

History:

- Past medical history
- Medications
 - Beta Blockers
 - Calcium Channel blockers
 - Clonidine
 - Digoxin
- Pacemaker

Signs and Symptoms

- HR <60/minute 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°, 3°)
- Overdose

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- Stable Hypotension (SBP<90mmHg) IV Bolus of **NS 500 mL**

Paramedic-Perform/Confirm All Above Interventions

Unstable with altered mental status or severe chest pain

- **Atropine 0.5 mg** IVP, Repeat every 3 minutes as needed (Maximum dose 3mg)

If symptoms persist after Atropine or any delay in establishing IV:

- External Cardiac Pacing Procedure [Page 257](#)
 - **100 BPM & 50 mA**
- Sedation if patient condition and time allows (hold if SBP<90 mmHg)
- **Fentanyl 50 mcg** and **Midazolam 2 mg** IV/IO/IN
- **Titrate to maximum total dose of Fentanyl 200 mcg** and **Midazolam 4 mg**

For hypotension (systolic BP <90 mmHg) and/or Bradycardia (HR<60) not improved by above

- **Epinephrine infusion or Epi Push Dose Pressor at 2-10 mcg/min** titrated to maintain SBP >90 mmHg.

Cardiac-Bradycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Chest Pain

E	General Approach Protocol Page 27	E
---	--	---



B	12 Lead EKG Procedure as soon as possible Page 225	B
P	Perform Right Sided 12 lead EKG if Inferior MI Present	P
B	ASA 324 mg PO	B
E	Oxygen via NC or NRB to maintain $\geq 92\%$ SPO2	E
AE	IV Protocol Page 104	P
AE	0.4 mg of Nitroglycerin every 3-5 minutes if SBP > 100 mmHg. (Max 3 doses for AE)	P
P	Odansetron (Zofran) 4 mg IV for nausea or vomiting, may repeat 4 mg if symptoms persist	P
P	50 mcg of Fentanyl w/ continued CP despite Nitroglycerin if SBP > 90 mmHg (200 mcg Max)	P
MC	Consult Medical Control	MC



- Place V4 on the right side of chest becoming V4R
- Withhold all Nitrates (Nitroglycerin)
- Establish a second peripheral IV, large bore being optimal
- Deliver 500 mL of NS before the consideration of Nitrates

Notify facility **EARLY**



IF symptoms for < 12 hours, and any of the following:

- Paramedic interprets ST segment elevation > 1 mm in two or more contiguous leads
- Defib interpretation of "*** ACUTE MI**" on EKG
- New Left BBB (confirmed by comparing to prior EKG)



STEMI ALERT

For Hypotension Not Resolved By Fluid
Refer to Shock (Non-Traumatic) Protocol
[Page 110](#)



For Any Arrhythmias That Become
Present Refer to Respective Protocol

Cardiac-Chest Pain

Cardiac-Chest Pain

History

- Age
- Medications
- Viagra, Levitra, Cialis
- Past Medical History (MI, Angina, Diabetes, post menopausal)
- Allergies (ASA, morphine, lidocaine)
- Recent physical exertion
- Palliation/Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region/Radiation/Referred
- Severity (1-10)
- Time(onset/duration/repitition)

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. MI
- Pericarditis
- Pulmonary embolism
- Pneumothorax Asthma / COPD
- Aortic dissection or aneurysm
- GE reflux or hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- OD (Cocaine) or Methamphetamine

Emergency Medical Responder

1. Perform initial assessment to include:
 - Time of onset of symptoms or change in symptoms
 - Past Medical History of cardiac disease, diabetes or hypertension
 - Any interventions performed (previous medications, aspirin, nitroglycerin, etc)
2. Administer **Oxygen** at appropriate flow rate
3. Focused physical exam for cardiac patient, including baseline vital signs
4. Prepare for transport

Basic-Perform/Confirm All Above Interventions

If suspected cardiac etiology:

1. Apply cardiac monitor using monitoring electrodes
2. Perform 12 Lead EKG Procedure [Page 225](#)
3. Administer four **81 mg** tablets of chewable **Aspirin (324 mg total)**
4. Evaluate for assisting the patient in taking their own **Nitroglycerin**:
 - Contraindications:
 - Hypotension (SBP < 90 mm Hg)
 - Head injury
 - Recent use of erectile dysfunction drugs, such as Viagra, Cialis or Levitra
 - Patient has already taken 3 of their own nitroglycerin

Consult Medical Control

For authorization to assist the patient in taking their own Nitroglycerin.

- Place or spray under tongue
- Reassess vital signs for hypotension after each intervention and if the SBP remains above 100 mm Hg, may repeat every 3-5 minutes to a total of 3 doses

Cardiac-Chest Pain

Chest Pain Cont.

5. Initiate transport, with close observation.
6. If cardiac etiology is not suspected,
7. Initiate Transport

A-EMT-Perform/Confirm All Above Interventions

1. IV Protocol [Page 104](#)
1. Administer **Nitroglycerin** if SBP > 90 and patient has not already received 3 doses.
 - Place or spray under tongue
 - Reassess vital signs for hypotension after each intervention and if the SBP remains above 100 mm Hg, may repeat every 3-5 minutes to a total of 3 doses.

Paramedic-Perform/Confirm All Above Interventions

- **If Myocardial Infarct is confirmed, activate STEMI CODE as soon as possible.**
 - If elevation is noted in leads II, III, & aVF, perform Right Sided 12 Lead EKG to confirm Inferior MI:
 - **Place V4 on right side of chest making it VR4**
 - **Withhold all Nitrates (Nitroglycerin)**
 - **Establish a second peripheral IV, large bore being optimal**
 - **Deliver 500 mL of NS prior to the consideration of Nitrates**
 - If any dysrhythmias are noted refer to appropriate protocol.
2. Administer **Nitroglycerin** if SBP > 90
 - Place or spray under tongue
 - Reassess vital signs for hypotension after each intervention and if the SBP remains above 100 mm Hg, may repeat every 3-5 minutes
 2. For any nausea or vomiting administer **4 mg** of **Ondansetron (Zofran)** IV, may repeat **4 mg** if symptoms persist.
 3. Administer **Fentanyl (Sublimaze) 50 mcg** IV if patient has continued pain despite nitroglycerin and aspirin.
 - Reassess vital signs after each dose.
 - May repeat every 3- 5 minutes to a **total dose of 200 mcg** of **Fentanyl (Sublimaze)** provided SBP remains above 90 mm Hg before each dose.

Cardiac-Chest Pain

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Hypertensive Emergency

E	General Approach Protocol Page 27	E
---	--	---

Check manual BP in both arms

B	12 Lead EKG Procedure Page 225	B
---	--	---

If 12 Lead EKG reveals a dysrhythmia refer to respective protocol

AE	IV Procedure Page 269	P
----	---------------------------------------	---

MC	Consult Medical Control	MC
----	-------------------------------	----

P	Consider Labetalol 10mg slow IV Push	P
---	--	---

P	Consider Nitro 0.4 mg sublingual	P
---	---	---

Cardiac-Hypertensive Emergency

Cardiac-Hypertensive Emergency

History:

- Documented Hypertension
- Related diseases: diabetes, CVA, renal failure, cardiac
- Medications (compliance ?)
- Erectile dysfunction medication
- Pregnancy

Signs and Symptoms

One of these

- Systolic BP 200 or greater
- Diastolic BP 110 or greater

And at least one of these

- Headache
- Nosebleed
- Blurred vision
- Dizziness

Differential

- Hypertensive encephalopathy
- Primary CNS injury (Cushings response = bradycardia with hypertension)
- Myocardial Infarction
- Aortic dissection (aneurysm)
- Pre-eclampsia/Eclampsia

Emergency Medical Responder

- General Patient Care Protocol-Adult [Page 27](#)
- Manual BP taken on both arms

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)
 - If 12 Lead EKG reveals a dysrhythmia refer to respective protocol

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Contact Medical Control for the following items below.

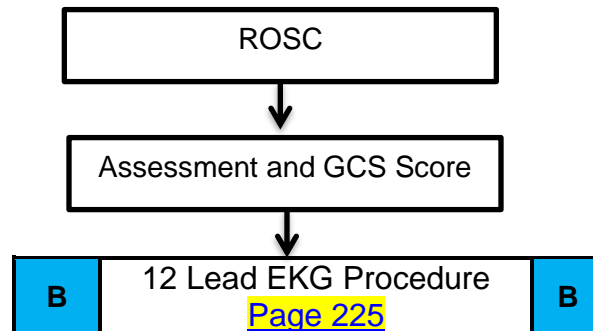
Paramedic-Perform/Confirm All Above Interventions

- Consider administering **10 mg Labetalol** slow IV Push, contact medical control for second dose
- Consider administering **0.4 mg Nitro** sublingual

Cardiac-Hypertensive Emergency

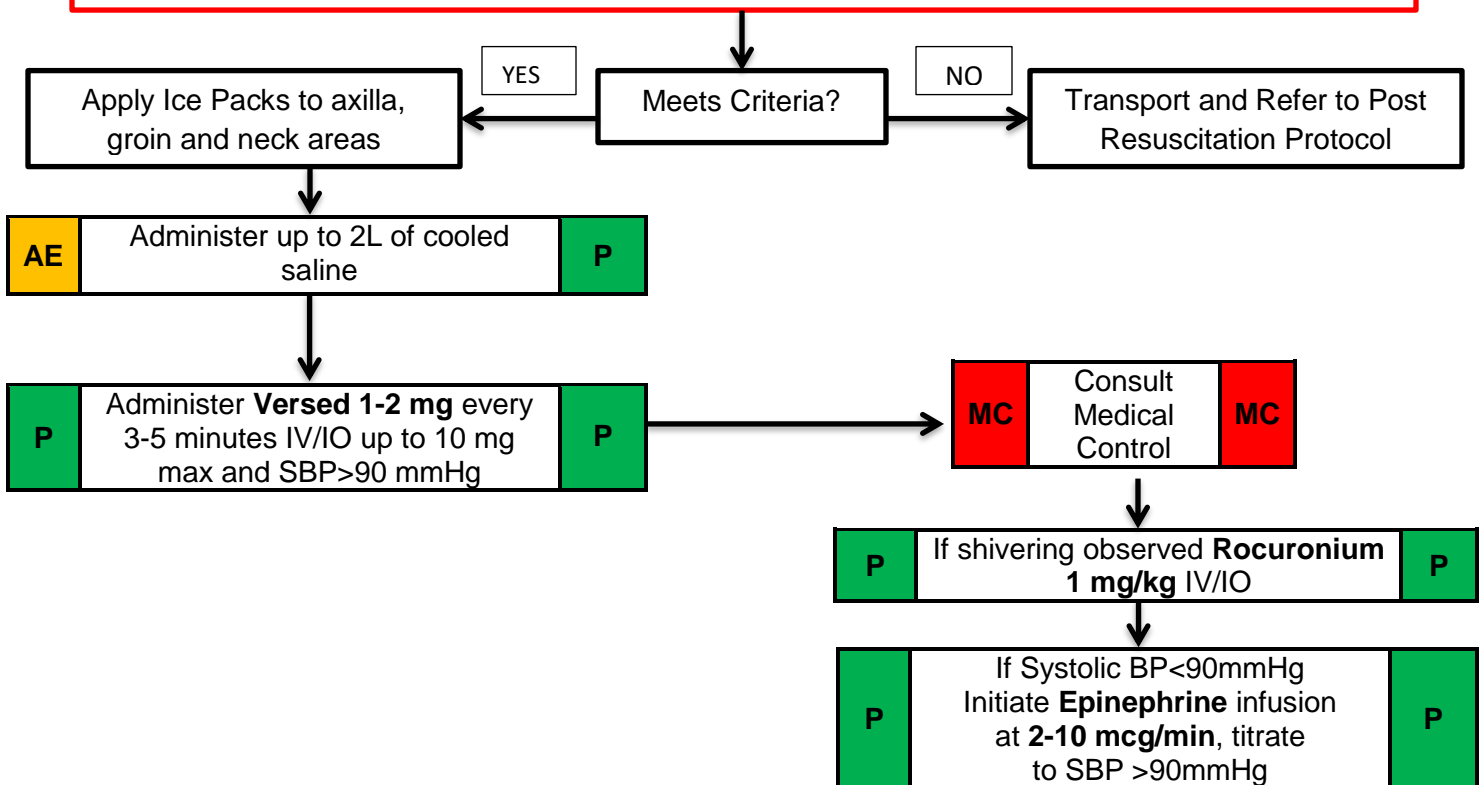
LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Induced Hypothermia



Criteria for Inclusion

- Witnessed Cardiac Arrest with ROSC
- Over age 15
- No evidence of trauma or intracranial hemorrhage
- Significant altered level of consciousness (not following commands, no purposeful movement, incomprehensible speech)
- No Valid DNR
- No history of bleeding disorder (warfarin/coumadin and heparin are NOT contraindications)
- Patient must have airway secured (NVA/ETT)
- Environmental hypothermia is not present
- Patient must have functioning IV/IO and an advanced airway established



Cardiac-Induced Hypothermia

Cardiac-Induced Hypothermia

History:

Non-traumatic cardiac arrests (drowning's and hangings/ asphyxiation are permissible in this protocol)

Signs and Symptoms

-Cardiac Arrest
-ROSC post-cardiac arrest

Differential

- Continue to address specific differentials associated with the original dysrhythmia

Most patients suffering from cardiac arrest with return of spontaneous circulation (ROSC) die with anoxic brain injury. Therapeutic hypothermia serves to improve the chance of a good neurologic outcome.

Emergency Medical Responder

- ROSC (Return of Spontaneous Circulation)
- GCS Score
- Inclusion Criteria:
 - Witnessed Cardiac Arrest with ROSC
 - Over age 15
 - No evidence of trauma or intracranial hemorrhage
 - Significant altered level of consciousness (not following commands, no purposeful movement, incomprehensible speech)
 - No Valid DNR
 - No history of bleeding disorder (warfarin/Coumadin and heparin are NOT contraindications)
 - Patient must have airway secured (NVA/ETT)
 - Environmental hypothermia is not present
 - Patient must have functioning IV/IO and an advanced airway established

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- Administer up to **2L of cooled saline** IV/IO.

Paramedic-Perform/Confirm All Above Interventions

- Ensure all inclusion criteria has been met.
- Apply ice packs to axilla, groin and neck.
- Closely monitor ventilation, target ETCO₂ to 40 mmHg, do not hyperventilate.
- Administer **Versed 1-2 mg** every 3-5 minutes IV/IO to a **max of 10 mg**.

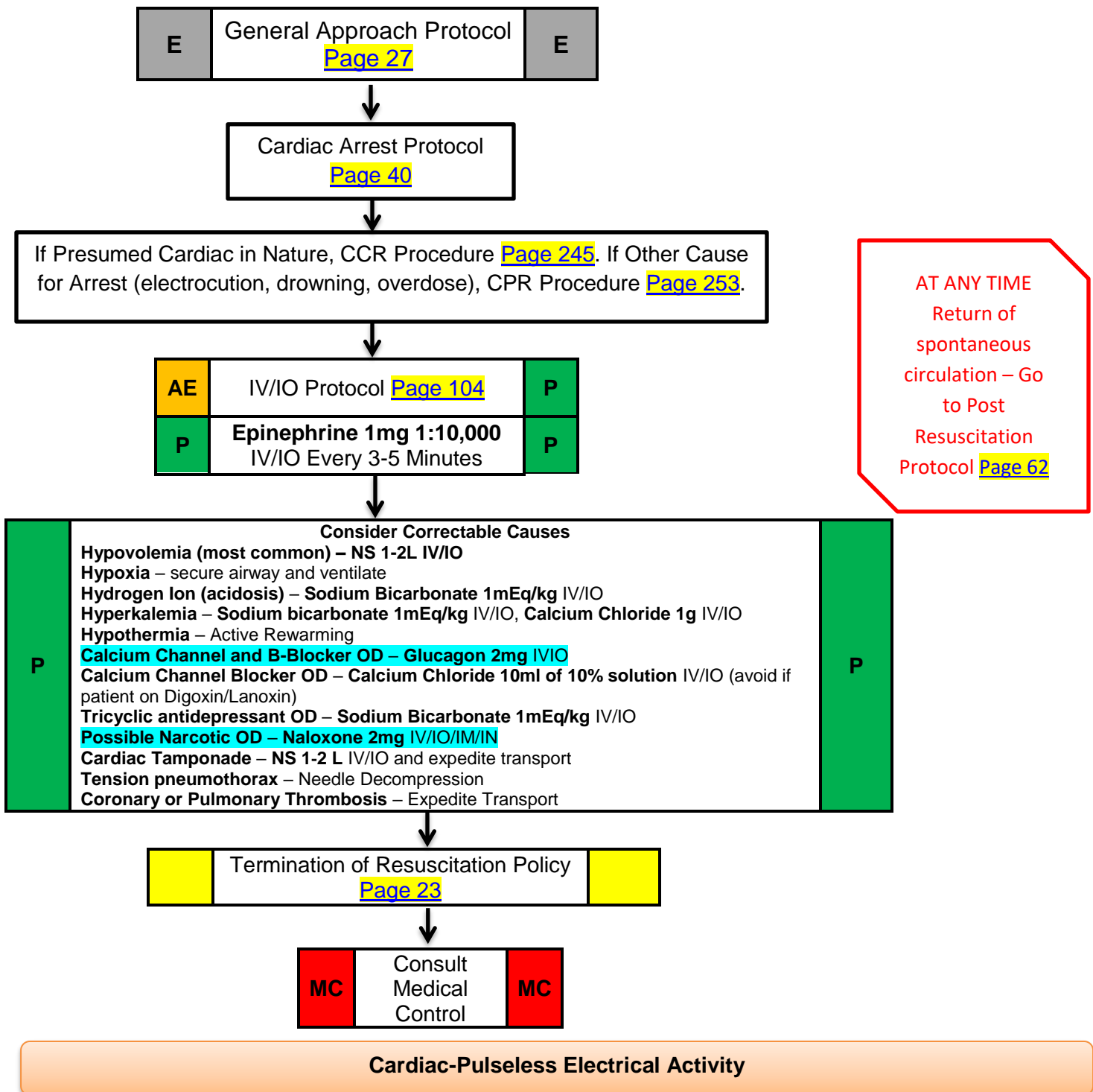
Contact Medical Control for the following items below.

- If shivering, administer **Rocuronium 1 mg/kg** IV/IO.
- If systolic blood pressure < 90 mmHg, initiate **Epinephrine infusion at 2-10 mcg/min**, titrate to SBP > 90 mmHg
- If at any time there is loss of spontaneous circulation, discontinue cooling and go to the appropriate protocol.

Cardiac-Induced Hypothermia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Pulseless Electrical Activity



Cardiac-Pulseless Electrical Activity

History:

- Past Medical History
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected Overdose
- DNR

Signs and Symptoms

- Pulseless
- Apneic
- Electrical activity on ECG
- No heart tones on auscultation

Differential

- Hypovolemia (trauma, AAA, other)
- Cardiac Tamponade
- Hypothermia
- Drug Overdose (Tricyclics, Digitalis, Beta Blockers, Calcium channel blockers)
- Massive MI
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach Protocol [Page 27](#)
- Cardiac Arrest Protocol [Page 40](#)
- If presumed cardiac in nature, CCR Procedure [Page 245](#). CPR Procedure ([Page 253](#)) for all other arrests (drowning, electrocution, overdose, ect.)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- Consider and treat possible causes

Potential Causes of PEA	Treatment
Hypovolemia (most common)	Normal Saline 1-2 L IV/IO
Hypoxia	Secure airway and ventilate
Hydrogen Ion (acidosis)	Sodium Bicarbonate 1 mEq/kg IV/IO
Hyperkalemia (end stage renal disease)	Sodium Bicarbonate 1 mEq/kg IV/IO Calcium Chloride 10ml of 10% IV/IO over 20 minutes
Hypothermia	Active rewarming
Tablets (drug overdose)	See below:
Tamponade, Cardiac	Normal Saline 1-2 L IV/IO Expedite transport
Tension pneumothorax	Needle thoracostomy
Thrombosis, Coronary	Expedite transport
Thrombosis, Pulmonary	Expedite transport

Cardiac-PEA

Cardiac-Pulseless Electrical Activity Cont.

- **Epinephrine 1 mg** IV/IO every 3-5 min during arrest
- Drug overdoses (see specific drug OD/toxicology section)
 - **Glucagon 2 mg** IV/IO for calcium channel and B-blocker OD
 - **Calcium Chloride 10ml of 10%** IV/IO over 20 minutes for calcium channel blocker OD
 - Avoid if patient on Digoxin/Lanoxin
 - **Sodium Bicarbonate 1 mEq/kg**, IV/IO for Tricyclic antidepressant OD
 - **Naloxone (Narcan) 2 mg** IV/IO/IM/IN for possible narcotic OD
- If no response to resuscitative efforts in 20 minutes consider discontinuation of efforts (see **Termination of Resuscitation Policy** [Page 23](#))

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Post Resuscitation

Repeat Primary Assessment

Patient candidate for Induced Hypothermia?

YES

P

Consider Induced Hypothermia Protocol
[Page 56](#)

P

NO

Continue Ventilatory Support

- Oxygen Sat's >92%
- ETCO2 goal 40
- RR <12

DO NOT HYPERVENTILATE

GCS & Vital Signs
(Including Pulse Ox)

B	12 Lead EKG Procedure Page 225	B
AE	IV Protocol Page 104	P

Continue anti-arrhythmic if ROSC was associated with its use

Hypotension <90 mmHg

Combative

Re-Arrest

AE	Normal Saline Bolus up to 500 mL	P
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P	Versed 1-2 mg slow IV/IO may repeat x1 (max dose 4 mg) & SBP > 90 mmHg If intubated with risk of dislodgment or injury Rocuronium 1 mg/kg can be administered.	P
---	---	---

Follow appropriate arrest protocol

P	If not improved by NS bolus -Epi Infusion or Epi Push Dose Pressor 0.1-0.5 mcg/kg/min titrated to maintain SBP >90mmHg (Ex 70 kg or 154 lbs patient 10-50 mcg/min)	P
---	---	---

MC	Consult Medical Control	MC
----	-------------------------	----

Cardiac-Post Resuscitation

Cardiac-Post Resuscitation

History:

- Respiratory Arrest
- Cardiac Arrest

Signs and Symptoms

- Return of pulse

Differential

- Continue to address specific differentials associated with the original dysrhythmia

Emergency Medical Responder

- General Patient Care Protocol [Page 27](#)
- Maintain assisted ventilation as needed
- **Oxygen** as needed to maintain sat $\geq 92\%$
- ETCO₂ if available

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

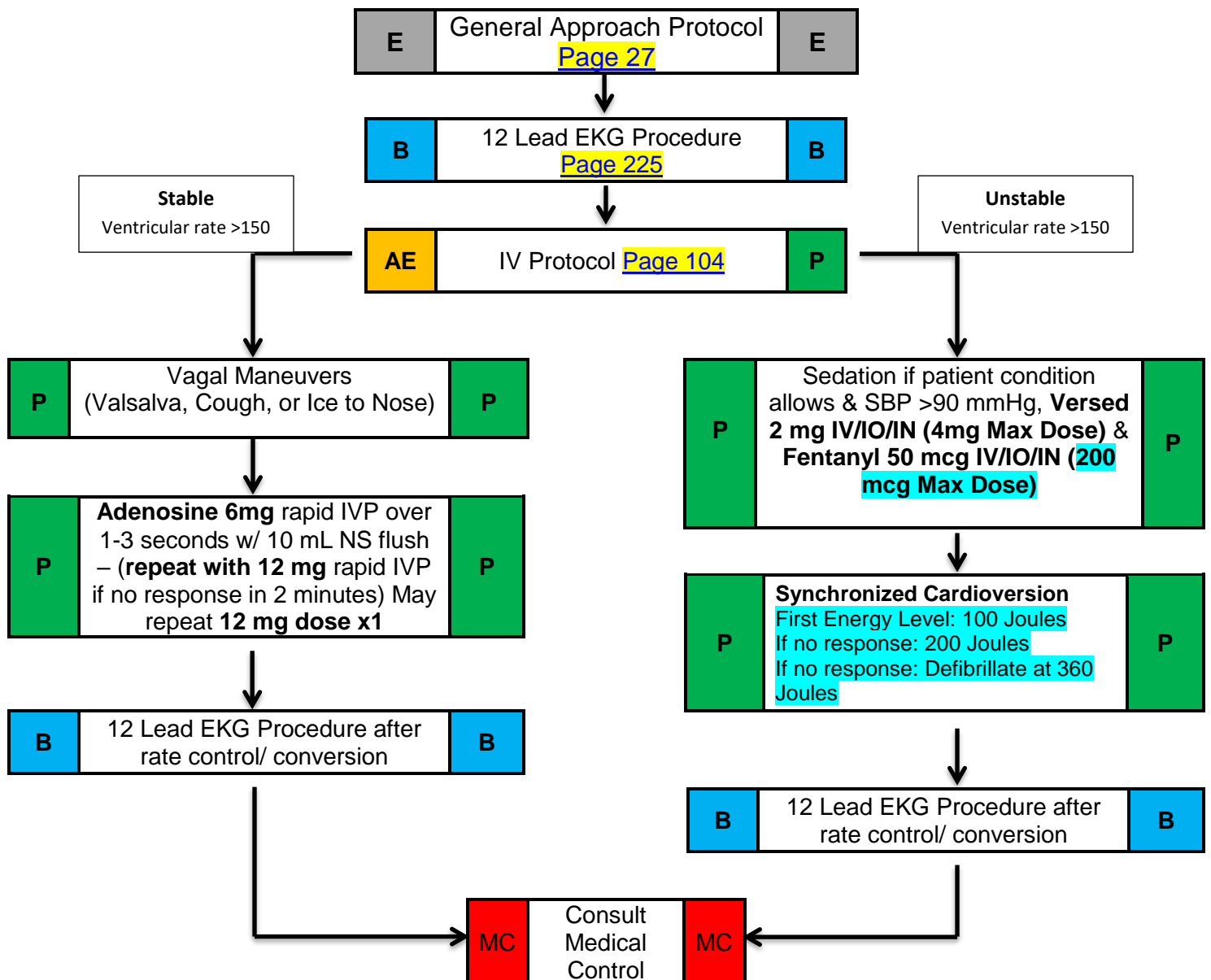
Paramedic-Perform/Confirm All Above Interventions

- Monitor ETCO₂, goal is 40mmHg, DO NOT HYPERVENTILATE
- For hypotension (systolic BP <90 mmHg) not improved by fluid boluses, or when fluid administration is contraindicated:
 - **Epi Infusion or Epi Push Dose Pressor 0.1-0.5 mcg/kg/min** titrated to maintain systolic BP >90 mmHg (Ex: 70 kg or 154 lbs patient 10-50 mcg/min)
- If VF/pulseless VT occurred during arrest **AND** Amiodarone was administered, consider additional anti-arrhythmic infusion to prevent recurrence
- If patient becomes combative, administer:
 - **Midazolam (Versed) 1-2 mg** slow IV/IO, **may repeat X 1 (maximum 4 mg)**
 - If intubated with risk of dislodgment or injury, **Rocuronium 1 mg/kg** can be administered.
- Consider **Therapeutic/Induced Hypothermia Protocol [Page 56](#)** for Return of Spontaneous Circulation (ROSC) without return of normal neurologic function.
- Transport to nearest appropriate facility

Cardiac-Post Resuscitation Care

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Supraventricular Tachycardia



Cardiac-Supraventricular Tachycardia

Cardiac-Supraventricular Tachycardia

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

- HR >150 bpm
- QRS <0.12 sec (if QRS >0.12 sec, go to V-Tach protocol)
- If history of WPW, go to V-Tach protocol
- Dizziness, CP, SOB
- Potential presenting rhythm
- Atrial/Sinus tachycardia
- Atrial fibrillation/flutter
- Multifocal atrial tachycardia

Differential

- Heart Disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial Infarction
- Electrolyte imbalance
- Exertion, pain, emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / OD (see HX)
- Hyperthyroidism
- Pulmonary embolus

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

Stable or borderline (Ventricular rate >150)

- Vagal maneuvers (Valsalva or Cough)
- **Adenosine Phosphate (Adenocard) 6 mg** rapid IVP over 1-3 seconds with 10 ml Normal Saline flush
If no response within 2 minutes repeat **Adenosine Phosphate (Adenocard) 12 mg** rapid IVP.
May repeat **12mg dose 1x**.
- 12 Lead EKG Procedure after rate control/ conversion.

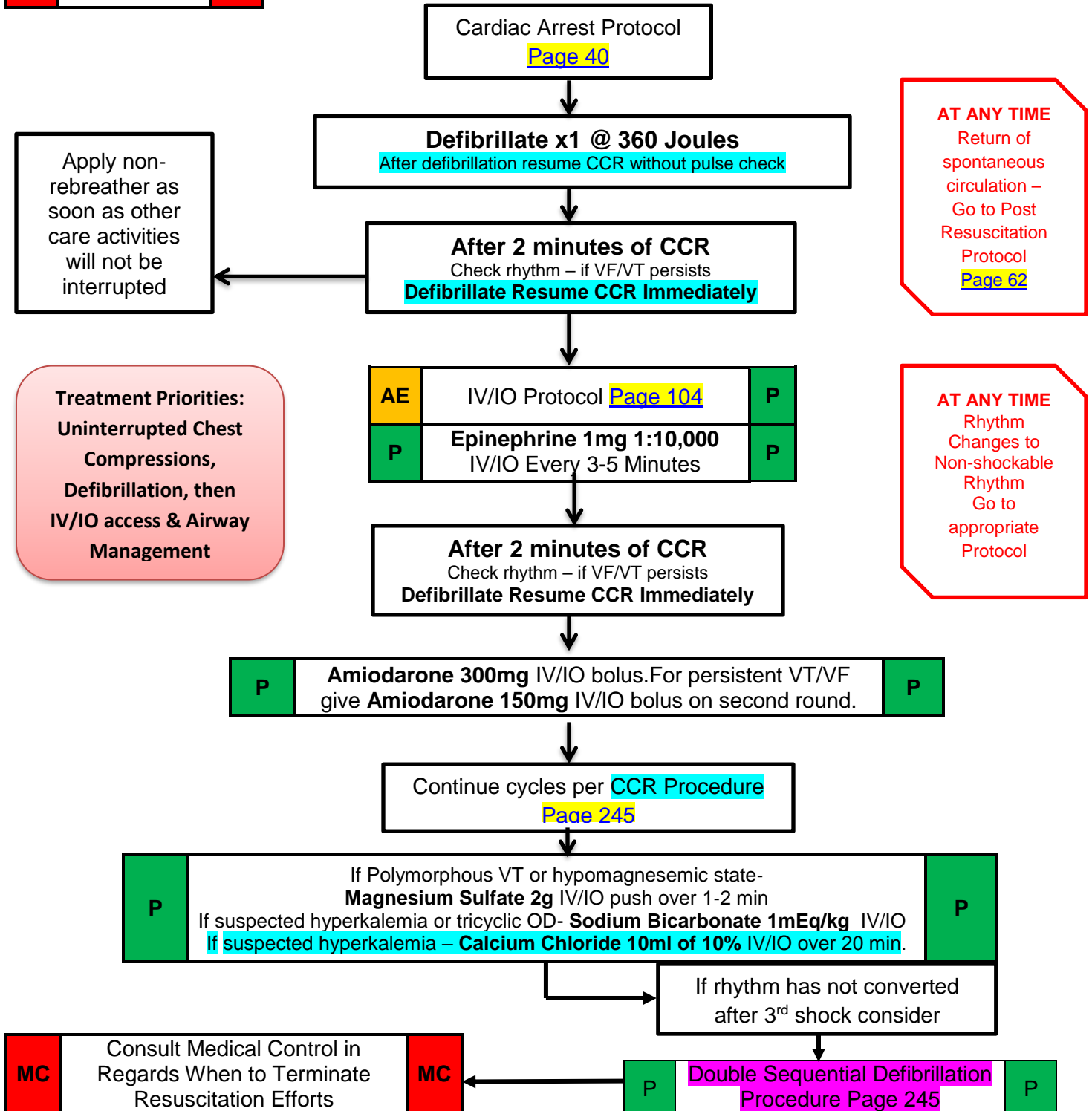
Unstable with serious signs and symptoms (Ventricular rate >150)

- May give brief trial of **Adenosine 6mg** rapid IVP over 1-3 seconds with 20 cc Normal Saline flush
- Sedation if patient condition and time allows (hold if SBP<90mmHg)
 - **Fentanyl 25-50 mcg** and **Midazolam 1-2 mg** IV/IO/IN
 - Titrate to maximum total dose of **Fentanyl 200 mcg** and **Midazolam 4 mg**
- Synchronized Cardioversion
 - First energy level: 100 Joules
 - If no response: 200 Joules
 - If no response, defibrillate at 360 Joules

Cardiac-Supraventricular Tachycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-VF & Pulseless VT



Cardiac-VF & Pulseless VT

Cardiac-Ventricular Fibrillation & Pulseless Ventricular Tachycardia

History:

- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal failure / dialysis
- DNR or living will

Signs and Symptoms

- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on EKG

Differential

- Asystole
- Artifact / Device failure
- Cardiac
- Endocrine / Metabolic
- Drugs
- Pulmonary

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach Protocol [Page 27](#)
- Cardiac Arrest Protocol [Page 40](#)
- If presumed cardiac in nature, CCR Procedure [Page 245](#). CPR Procedure ([Page 253](#)) for all other arrests (drowning, electrocution, overdose, ect.)
- Defibrillate for persistent VF/VT
 - Energy level should be 360 joules
 - Continue Chest Compressions immediately after shock (do not stop for pulse or rhythm check)
- Analyze rhythm after 2 minutes of continuous compressions; If VF/VT persists:
 - Defibrillate at manufacturers recommendations
 - Continue compressions immediately after shock (do not stop for pulse or rhythm check)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- Consider and treat possible causes
- **Epinephrine 1 mg 1:10,000** IV/IO every 3-5 min during arrest
- Analyze rhythm after 2 minutes of continuous compressions; If VF/VT persists:
 - Energy level should be 360 joules
 - Continue Chest Compressions immediately after shock (do not stop for pulse or rhythm check)
- **Amiodarone 300mg** IV/IO bolus
 - For persistent VT/VF give **Amiodarone 150 mg** IV/IO bolus on second round

Cardiac-V-Fib and Pulseless VTach

Cardiac-Ventricular Fibrillation & Pulseless Ventricular Tachycardia

- Continue cycle of Compressions & Drug
 1. Rhythm Check
 2. Compressions
 3. Shock
 4. Compressions & Drug
 5. Rhythm Check
 6. Compression
 7. Shock as needed
 8. Start cycle over again
- Additional interventions to consider in special circumstances
 - **Magnesium Sulfate 2 g** IV/IO push over 1-2 minutes only if suspected Polymorphous VT (torsades de pointes) or hypomagnesemic state (chronic alcohol or diuretic use)
 - **Sodium Bicarbonate 1 mEq/kg**, IV/IO if suspected hyperkalemia (dialysis patient) or tricyclic antidepressant OD
 - **Calcium Chloride 10ml of 10%** solution IV/IO over 20 minutes if suspected hyperkalemia (dialysis patient)
- If rhythm has not converted after third shock, consider Double Sequential Defibrillation Procedure Page 245
 - If no response to Double Sequential Debrillation

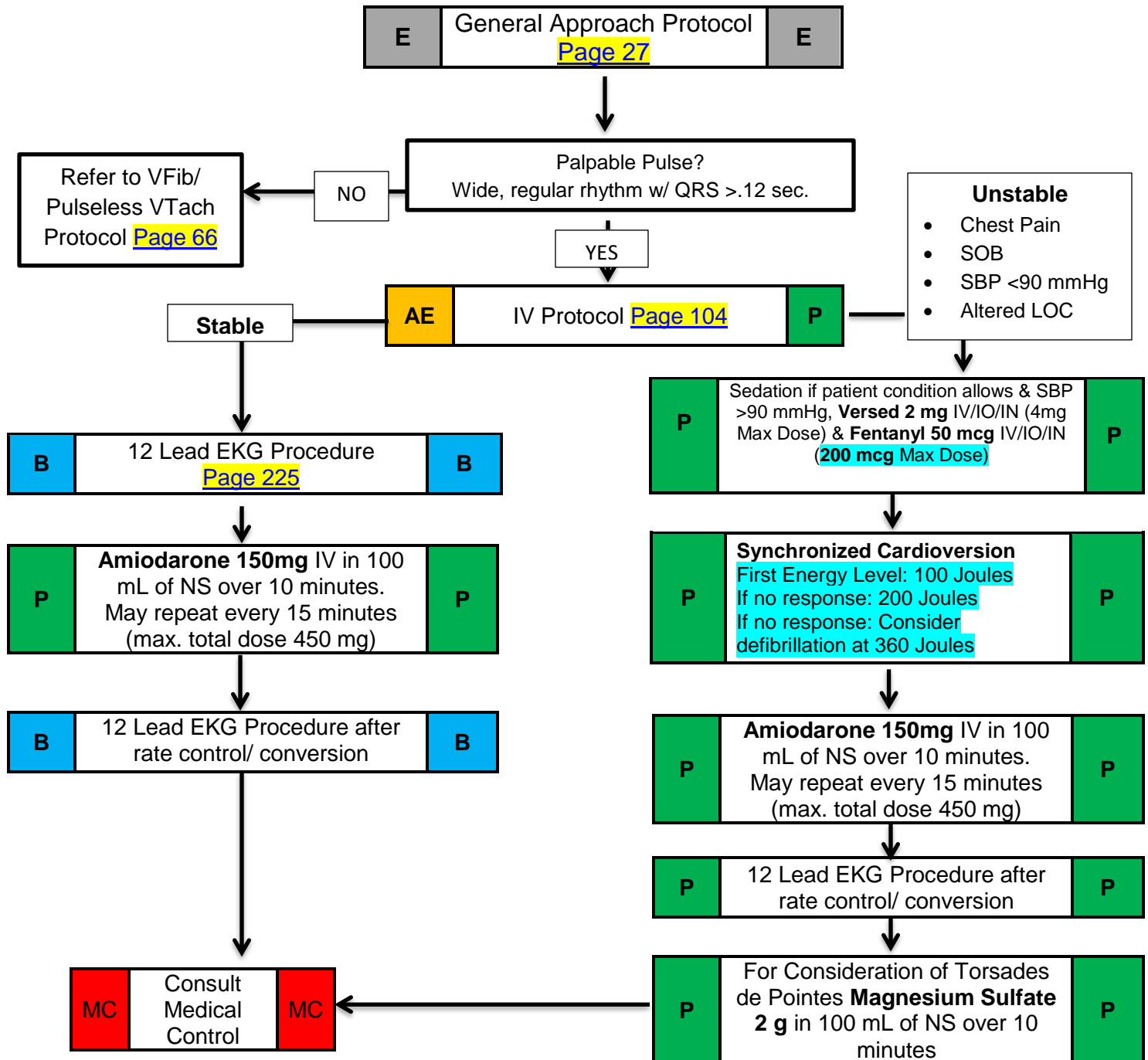
Contact Medical Control for consultation of when to terminate resuscitation efforts

Cardiac-V-Fib and Pulseless VTach

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Cardiac-Wide Complex Tachycardia



Cardiac-Wide Complex Tachycardia

Cardiac-Wide Complex Tachycardia

History:

- Past medical history / medications, diet, drugs
- Syncope / Near syncope
- Palpitations
- Pacemaker
- Allergies: Lidocaine / Novocaine
- CAD,CHF,Cardiomyopathy

Signs and Symptoms:

- Ventricular Tachycardia on ECG (Runs or Sustained)
- Conscious, rapid pulse
- Chest Pain, Shortness of Breath
- Dizziness
- Rate usually 150-180 bpm for sustained VT

Differential:

- Artifact / Device Failure
- Cardiac
- Endocrine/Electrolyte
- Hyperkalemia
- Drugs/Toxic exposure
- Pulmonary disease

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

Stable and unknown wide complex or ventricular tachycardia likely (rate >150)

- **Amiodarone 150 mg** in 100 ml D5W IV Piggyback over 10 minutes
- Repeat **Amiodarone 150 mg** in 100ml D5W IV Piggyback over 10 minutes every 15 minutes (Maximum of 450 mg total)
- 12 Lead EKG Procedure after rate control/ conversion

Unstable wide complex tachycardia (rate >150)

- Sedation if patient condition and time allows (hold for SBP <90 mmHg)
 - **Fentanyl 50 mcg** and **Midazolam 2 mg** IV/IO/IN
 - Titrate to maximum **total dose of Fentanyl 200 mcg** and **Midazolam 4 mg**
- Synchronized Cardioversion:
 - 1st energy level 100 Joules
 - If no response: 200 Joules
 - If no response: Consider defibrillation at 360 Joules
- If delays in synchronization occur and condition is critical, go immediately to unsynchronized shocks
- If wide complex tachycardia reoccurs following electrical cardioversion:
 - **Amiodarone 150 mg** in 100 ml D5W IV Piggyback, over 10 minutes, every 15 minutes (maximum 450 mg cumulative total dose)
- 12 Lead EKG Procedure after rate control/ conversion
- For consideration of Torsades de Pointes administer **Magnesium Sulfate infusion 2 g** in 100 mL of Normal Saline over 10 minutes.

Cardiac-Wide Complex Tachycardia

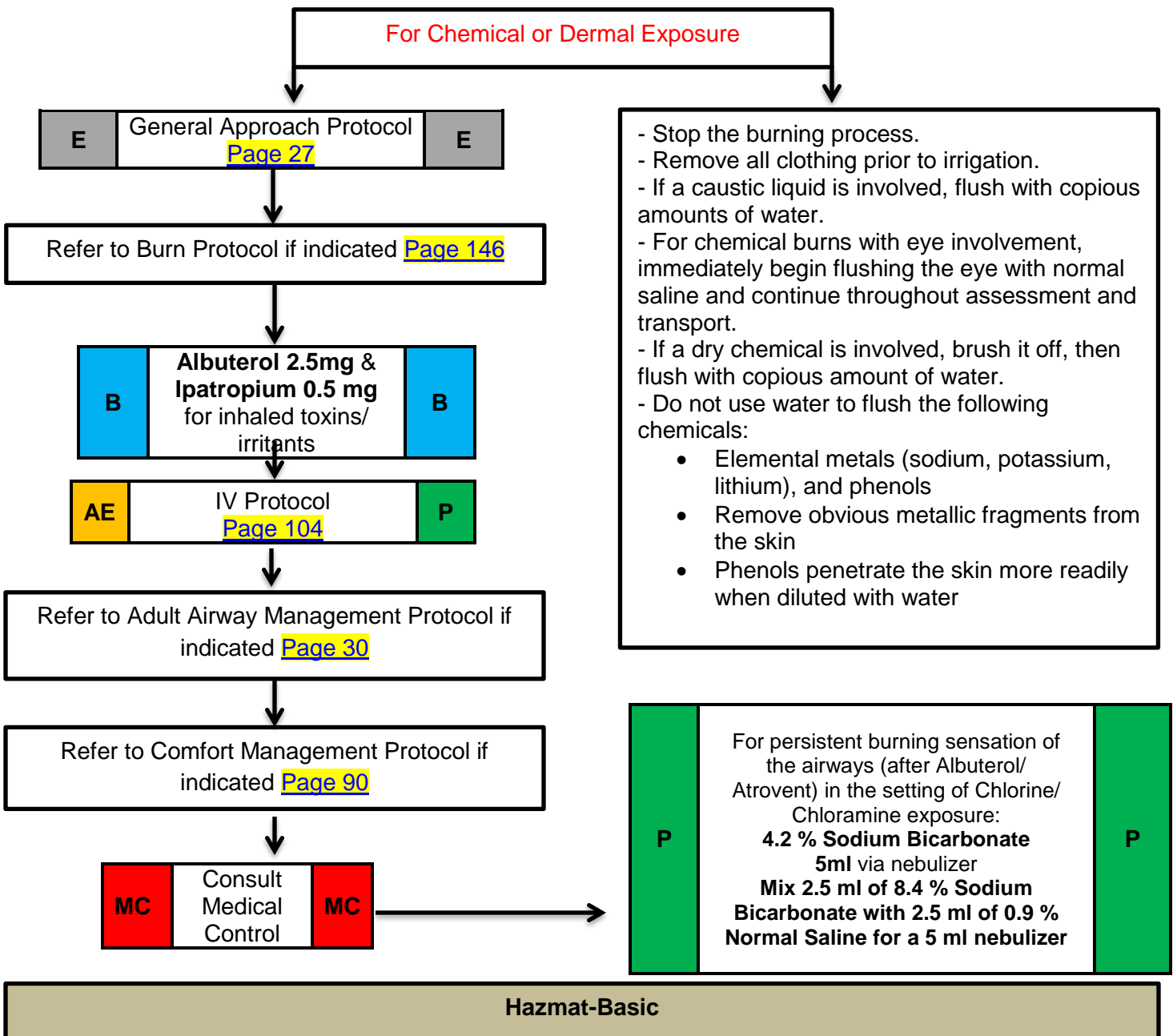
LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Hazmat - Basic

Consult Emergency Response Guidebook (ERG) before attempting to handle any toxic chemical exposure patient

Upon identifying a possible toxic exposure or overdose: Contact the Regional Poison Control Center (1-800-222-1222)

Upon identifying a possible hazmat exposure: Contact Regional HAZMAT TEAM via Door County Communication Center



Hazmat-Basic

- Assure that local Fire Department is responding with EMS if appropriate.
- Consult Emergency Response Guidebooks (ERG) before attempting to handle any toxic chemical exposure patient
- Upon identifying a possible toxic exposure or overdose:
Contact the Regional Poison Control Center (1-800-222-1222)
- Upon identifying a possible hazmat exposure: Contact Regional HAZMAT Team for chemical information via Door County Communications Center

Other possible #'s for assistance:

Chemtrec: 1-800-424-9300

Infotract: 1-800-535-5053

Chemtoll: 1-888-255-3924

3E: 1-800-451-8346

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

Chemical Burns and Dermal Exposure

- General Approach Protocol [Page 27](#)
- Refer to the Burn Protocol [Page 146](#)
- Stop the burning process
- Remove all clothing prior to irrigation
- If a caustic liquid is involved, flush with copious amounts of water
- For chemical burns with eye involvement, immediately begin flushing the eye with normal saline and continue throughout assessment and transport
- If a dry chemical is involved, brush it off, then flush with copious amount of water
- Do not use water to flush the following chemicals:
 - Elemental metals (sodium, potassium, lithium), and phenols
 - Remove obvious metallic fragments from the skin
 - Cover the burn with mineral oil or cooking oil
 - Phenols penetrate the skin more readily when diluted with water
 - If available, dilute with the following (listed in order of efficacy)
 - Polyethylene glycol (PEG)
 - Glycerol
 - Vegetable Oil
 - As a last resort use extremely large amounts of soap and water with continuous irrigation until all phenols are removed
- Apply a burn sheet or dry sterile dressing to burn areas
- For inhaled toxin with acute bronchospasm:
 - **Albuterol (Proventil) 2.5 mg/3 ml** via nebulizer and **Ipratropium Bromide 0.02% (Atrovent) 0.5 mg/2.5 ml** via nebulizer

Hazmat-Basic

Hazmat-Basic

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- Observe for signs of impending respiratory failure; Refer to the **Airway-Adult Protocol** [Page 30](#) if needed
- Refer to **Comfort Management Protocol** [Page 90](#) if needed

Contact Medical Control for any additional orders or questions

For persistent burning sensation of the airways (after Albuterol/Atrovent) in the setting of Chlorine/Chloramine exposure:

- 4.2 % Sodium Bicarbonate 5ml via nebulizer
- Mix 2.5 ml of 8.4 % Sodium Bicarbonate with 2.5 ml of 0.9 % Normal Saline for a 5 ml nebulizer

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Hazmat-Cyanide Toxicity

E	General Approach Protocol Page 27	E
---	--	---



Remove patient from contaminated area



B	Administer 100 % Oxygen	B
---	-------------------------	---



B	Carboxyhemoglobin SPCO Monitoring if available	B
---	---	---



AE	IV Protocol Page 104 Deliver a 500 mL bolus of NS	P
----	---	---



B	12 Lead EKG Procedure Page 225	B
---	---	---



Expedite transport and treat other symptoms per appropriate protocol



MC	Consult Medical Control	MC
----	-------------------------	----

Hazmat-Cyanide Toxicity

Hazmat-Cyanide Toxicity

Symptoms

- Headache
- Confusion
- Shortness of Breath
- Chest Pain or tightness
- Nausea/Vomiting

Signs

- Altered mental status
- Seizures or coma
- Dyspnea/tachypnea
- Respiratory distress/apnea
- Hypertension (early)
- Hypotension (late)
- Cardiovascular collapse/Cardiac Arrest

Cyanide poisoning may result from inhalation, ingestion or dermal exposure to cyanide containing compounds, including smoke from closed-space fires. The presence and extent of the poisoning are often unknown initially. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication.

Not all patients who have suffered smoke inhalation from a closed-space fire will have cyanide poisoning. Other conditions such as burns, trauma or other toxic inhalations (e.g. carbon monoxide) may be the cause of symptoms. When smoke inhalation is the suspected source of cyanide exposure assess the patient for the following:

- Exposure to fire or smoke in an enclosed space
- Presence of soot around the mouth, nose or oropharynx
- Altered mental status

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

General Patient Care Protocol—Adult [Page 27](#)

Supplemental 100% **Oxygen**

SPCO Monitoring if available

A-EMT-Perform/Confirm All Above Interventions

IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

Perform Full ALS Assessment and Treatment

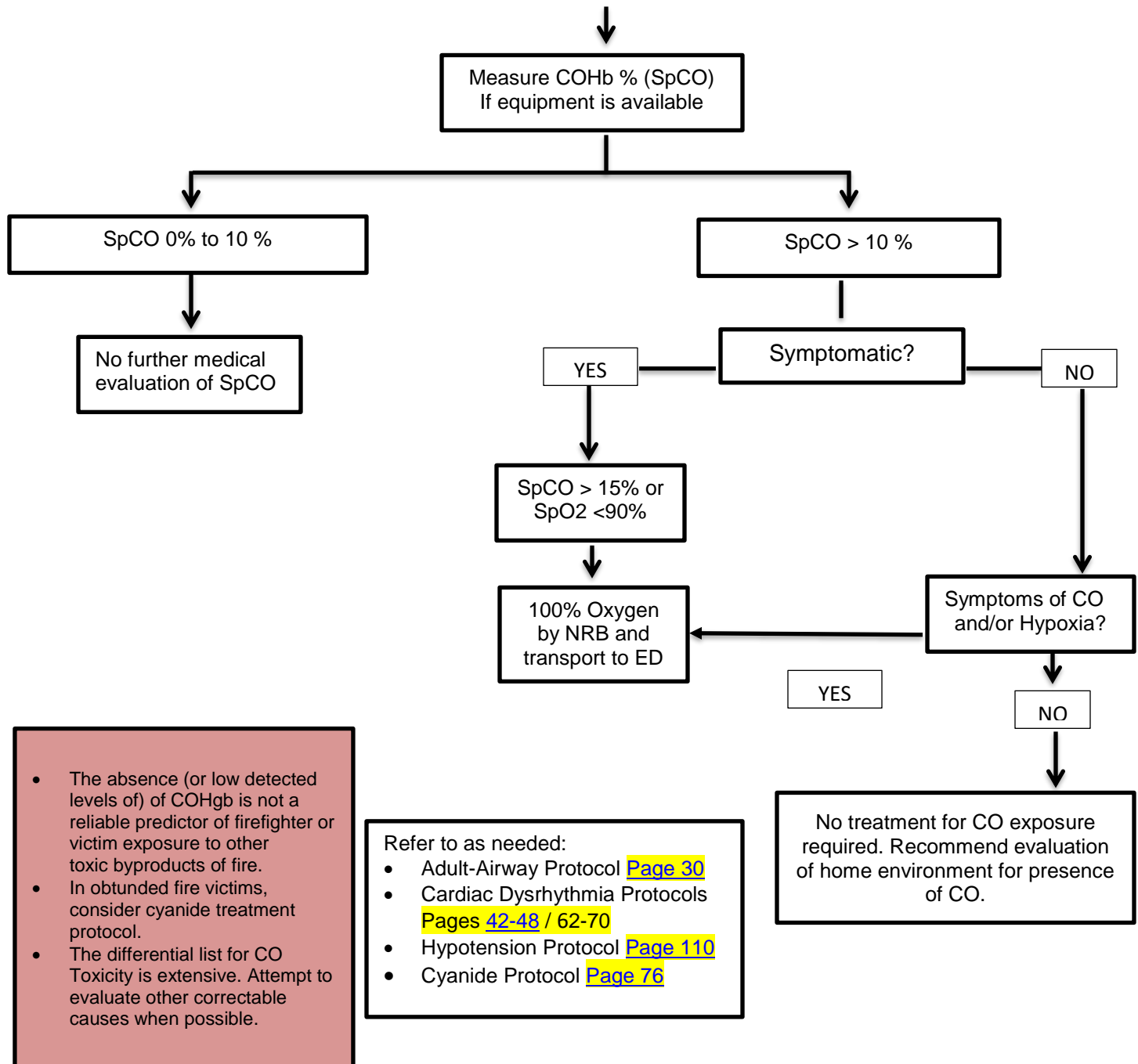
Expedite transport and treat other conditions as per appropriate.

Hazmat-Cyanide Toxicity

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Hazmat-Carbon Monoxide Exposure

E General Approach Protocol E
[Page 27](#)



Hazmat-Carbon Monoxide Exposure

Hazmat-Carbon Monoxide Exposure

History:

- Known or suspected CO exposure
- Suspected source/duration exposure
- Age
- Known or possible pregnancy
- Reason (accidental, suicidal)
- Measured atmospheric levels
- Past medical history, medications

Signs and Symptoms:

- Altered mental status/dizziness
- Headache, Nausea/Vomiting
- Chest Pain/Respiratory distress
- Neurological impairments
- Vision problems/reddened eyes
- Tachycardia/tachypnea
- Arrhythmias, seizures, coma

Differential:

- Effects of other toxic fire byproduct
- Acute cardiac event
- Acute neurological event
- Flu/GI illness
- Acute intoxication
- Diabetic Ketoacidosis
- Headache of non-toxic origin

Emergency Medical Responder

Basic-Confirm/Perform All Above Interventions

- General Patient Care Protocol—Adult [Page 27](#)
- Wear appropriate PPE (SCBA) as indicated
- Remove the patient from the contaminated source
- Supplemental 100% **Oxygen**, document time oxygen started
- If CO monitoring available
 - Document initial CO level
 - Follow **Carboxyhemoglobin SpCo Monitoring Procedure**

Paramedic-Confirm/Perform All Above Interventions

- For smoke inhalation patients also consider Cyanide poisoning. Refer to **Hazmat-Basic Protocol** [page 72](#) if indicated.

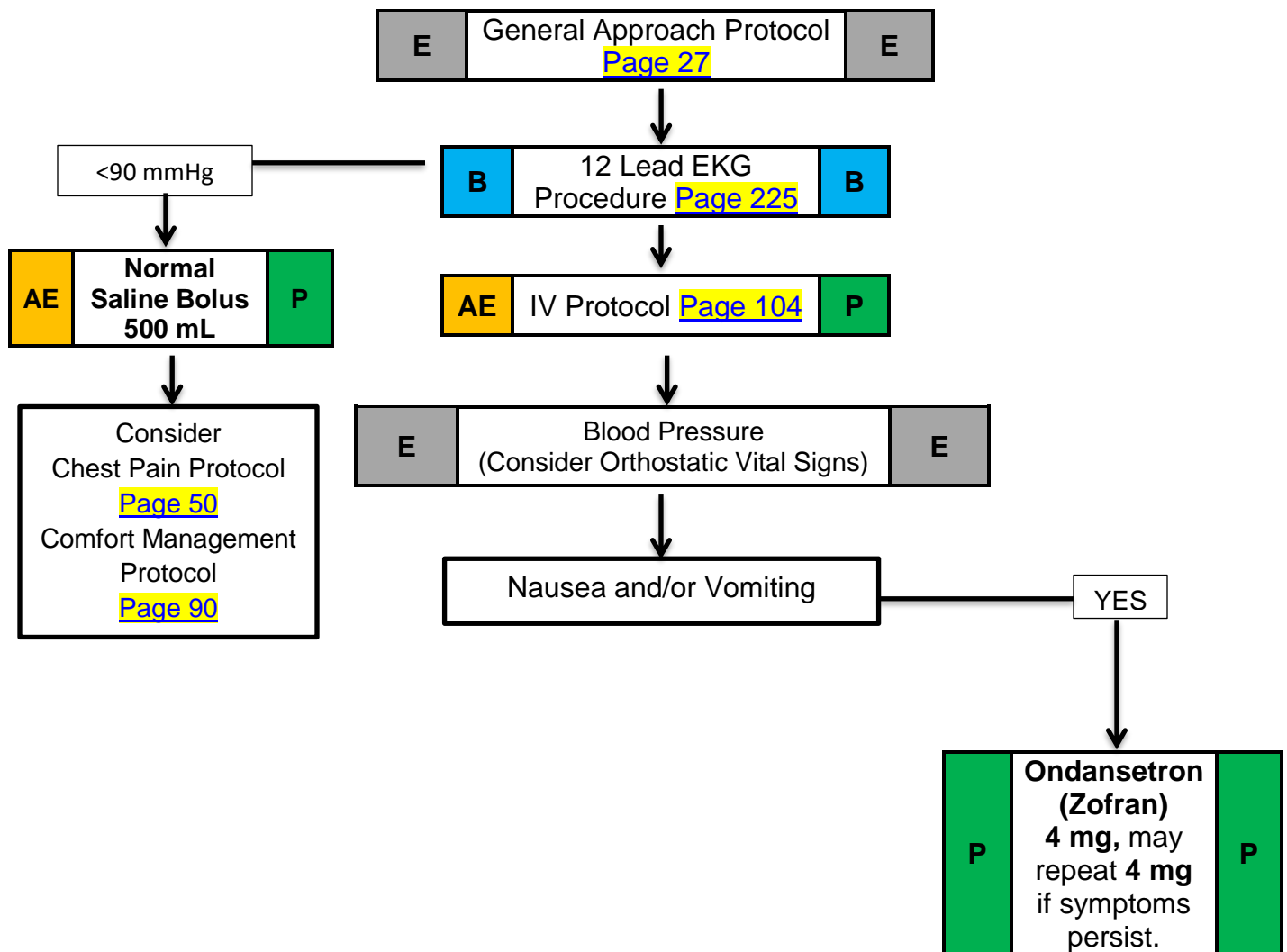
Follow flowchart in regards to SPCO levels to determine if transported

- Fetal hemoglobin has a greater attraction for CO than maternal hemoglobin. Females who are known to be pregnant or who could be pregnant should be advised that EMS-measured SpCO levels reflect the adults level and that fetal COHb levels may be higher. Recommend Hospital evaluation for any CO exposed pregnant person.
- The absence (or low detected levels of) of COHgb is not a reliable predictor of firefighter or victim exposure to other toxic byproducts of fire.
- In obtunded fire victims, initiate cyanide treatment protocol.

Hazmat-Carbon Monoxide Exposure

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Abdominal Pain/ GI Bleeding



Medical-Abdominal Pain/ GI Bleeding

Abdominal Pain/ GI Bleeding

History:

- Age
- Past Medical/surgical history
- Medications
- Onset
- Provocation
- Quality
- Region / Radiation / Referred
- Severity 1-10
- Time
- Fever
- Last meal eaten
- Last bowel movement
- Menstrual history (pregnancy)

Signs and Symptoms:

- Pain
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation
- Vaginal Bleeding/Discharge
- Pregnancy
- Other Symptoms: fever, headache, weakness, malaise, myalgias, cough, rash, mental status

Differential

- Pneumonia or PE
- Liver (hepatitis, CHF)
- Peptic Ulcer disease / Gastritis
- Gallbladder
- MI
- Pancreatitis
- Kidney Stone
- Abdominal Aneurysm
- Appendicitis
- Bladder/prostate disorder
- Pelvic
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Patient Care Protocol—Adult [Page 27](#)
- Nothing by mouth
- Consider Orthostatic Vital Signs
- If pain is above the umbilicus, perform 12-lead EKG, refer to Chest Pain Protocol [Page 50](#) if indicated

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- Consider Fluid Bolus-**500ml NS (max 2 liters)**

Paramedic-Perform/Confirm All Above Interventions

- For Patients with severe nausea or vomiting:
 - **Ondansetron (Zofran), 4 mg IV/IO/PO**, may repeat **4 mg** if symptoms persist.
- Refer to Comfort Management Protocol [Page 90](#) if indicated

Medical-Abdominal Pain/ GI Bleeding

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Allergic Reaction

E	General Approach Protocol Page 27	E
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Mild Reaction

-Hives/ Rash Only
-No Respiratory Component

AE	IV Protocol Page 104	P
P	Diphenhydramine 50 mg IV 50 mg IM 50 mg PO	P

Moderate Reaction

-Dyspnea, Wheezing,
Chest Tightness

B	Epinephrine 1:1000 0.3 SQ/IM	B
B	Albuterol 2.5 mg & Ipratropium 0.5 mg. May repeat Albuterol 2.5 mg after 5 minutes	B
AE	IV Protocol Page 104	P
P	Diphenhydramine 50 mg IV 50 mg IM	P
P	Solu Medrol 125 mg IV	P
P	Consider Xopenex 1.25 mg via nebulizer	P

Severe Reaction

-Evidence of Impending
Respiratory Distress or Shock
SBP <90 mmHg

E	Epinephrine 1:1000 0.3 SQ/IM	B
B	Albuterol 2.5 mg & Ipratropium 0.5 mg	B
AE	IV Protocol. Administer 500 mL of NS	P
P	Diphenhydramine 50 mg IV 50 mg IM	P
P	Solu Medrol 125 mg IV	P
MC	Consult Medical Control	MC
P	1 mL of Epinephrine 1:10000 IV w/ IV running wide open	P

Perform appropriate
Airway Management
based on patient's
condition

Medical-Acute Allergic Reaction

Acute Allergic Reaction

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
- 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 or COPD
- CHF

Emergency Medical Responder

1. Initial assessment.
 - It is useful, but not necessary to identify source of reaction.
 - Assess for latex allergy and utilize latex-free equipment as needed.
 - Time from onset. Severe reactions usually occur within 30 minutes.
 - History of anaphylaxis, epinephrine use or intubation.
2. Oxygen as indicated, if not already administered.
3. Patients with a systolic blood pressure of <90 mm Hg, difficulty breathing or swelling of the face, mouth and throat should be treated as anaphylactic shock. If the patient has not already used an EpiPen, administer an EpiPen if trained to do so or administer Epinephrine 1:1000 0.3 mg SQ/IM. **Note that an EpiPen should only be used once unless specifically ordered differently by Medical Control.**

Basic-Perform/Confirm All Above Interventions

Mild Reaction: (isolated rash or subjective complaints with no physical findings and normal vital signs) No respiratory complaints:

- Reassure and begin transport under observation.

Moderate Reaction (has wheezing, dyspnea, chest tightness)

- **Epi 1:1000** 0.3 SQ/IM
- Administer an **Albuterol (Ventolin)** or if available **Duo Neb (Albuterol & Atrovent)** nebulizer.

Severe Reaction (SBP < 90, swelling of face, mouth or throat or stridor):

- Elevate the patient feet above level of the heart if SBP <90 provided the position is tolerated by respiratory effort.
- Apply cardiac monitor.

Medical-Acute Allergic Reaction

Acute Allergic Reaction

A-EMT-Perform/Confirm All Above Interventions

Moderate/Severe Reaction:

- IV Protocol [Page 104](#)
- Administration of **Epinephrine 0.3 mg SQ/IO**

Paramedic-Perform/Confirm All Above Interventions

Mild Reaction (isolated rash or subjective complaints with no physical findings and normal vital signs) No Respiratory Complaints:

- IV Protocol [Page 104](#)
- Administration of **Diphenhydramine (Benadryl) 50 mg IV, 50 mg IM, 50 mg PO**
- Epinephrine is not used for itching and hives

Moderate Reaction with more than one system (rash and wheezing, mouth swelling and wheezing, respiratory distress and rash, GI symptoms and rash)

- Administer an **Albuterol (Ventolin)** or if available **Duo Neb (Albuterol & Atrovent)** nebulizer if not already given. **Albuterol (Ventolin)** may be repeated once after 5 minutes if wheezing persists. Consider **Xopenex 1.25 mg** via nebulizer
- IV Protocol [Page 104](#)
- Administer **Benadryl 50 mg IV or 50 mg IM**
- Consider administration of **Epinephrine 1:1000** with a dose of 0.3 mg SQ/IM if no contraindications.
- Administer **Solu Medrol 125 mg IV**

Severe Reaction (SBP < 90, swelling of face, mouth or throat or stridor):

- Administer **Epinephrine 1:1000 dose 0.3 mg SQ/IM** if no contraindications
- Administer an **Albuterol (Ventolin)** or if available **Duo Neb (Albuterol & Atrovent)** nebulizer
- IV Protocol [Page 104](#)
- Administration of **Diphenhydramine (Benadryl) 50 mg IV or 50 mg IM**
- Administer **Solu Medrol 125 mg IV**
- Administer a fluid bolus of **500 mL of NS** if SBP <90 mmHg

Consult Medical Control

Consider administration of Epinephrine 0.1 mL of 1:1,000 solution or 1 mL of 1:10,000 solution IV for refractory anaphylactic shock.

- Dilute with 9-10 mL NS or administer with IV running wide open
- Cardiac Monitoring required due to risk of cardiac dysrhythmias

Medical-Acute Allergic Reaction

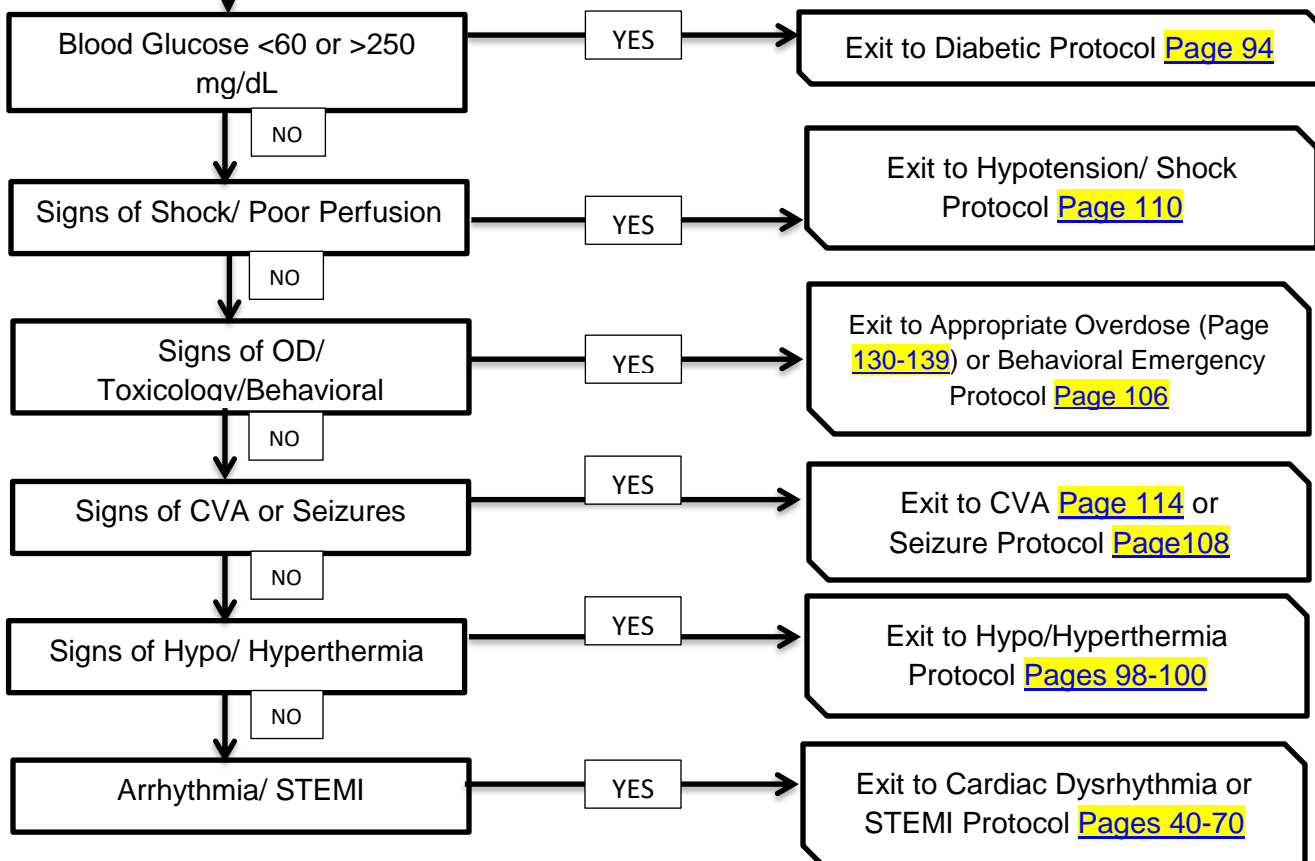
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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Altered Mental Status

E	General Approach Protocol Page 27	E
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B	Blood Glucose Procedure Page 242	B
B	12 Lead EKG Procedure Page 225	B
AE	IV Protocol Page 104	P



Medical-Altered Mental Status

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
- 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 or other)
- Shock (septic, metabolic traumatic)
- Diabetes (hyper/hypo)
- Toxicological or Ingestion
- Acidosis/Alkalosis
- Environmental exposure
- Pulmonary (hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

Emergency Medical Responder

- General Patient Care Protocol—Adult [Page 27](#)
- Blood Glucose
 - If hypoglycemic (Blood glucose < 60mg/dL)
 - **Glucose paste 15 g** or other oral glucose agent (e.g. orange juice) if patient alert enough to self-administer

Basic-Perform/Confirm All Above Interventions

- If hypoglycemic and unable to take oral glucose:
 - Consider **Glucagon 1mg IM**
- 12 Lead EKG Procedure [Page 225](#)
- If Stroke suspected refer to Stroke Protocol [Page 114](#)
- If Head Injury suspected refer to Trauma/Head Injury Protocol [Page 159](#)
- If cardiac arrhythmia present refer to Cardiac Arrhythmia Protocol [Pages 40-70](#)
- If signs of shock or poor perfusion refer to Hypotension Non-Traumatic Shock Protocol [Page 110](#)
- Signs of Overdose, Toxicity, Behavioral or Psychological refer to appropriate Overdose ([Page 130](#)) or Behavioral Emergency Protocols [Page 106](#)
- Signs of Hypo/Hyperthermia refer to Hypo/Hyperthermia Protocol [Pages 98-100](#)

Medical-Altered Mental Status

Altered Mental Status

A-EMT-Perform/Confirm All Above Interventions

Paramedic-Perform/Confirm All Above Interventions

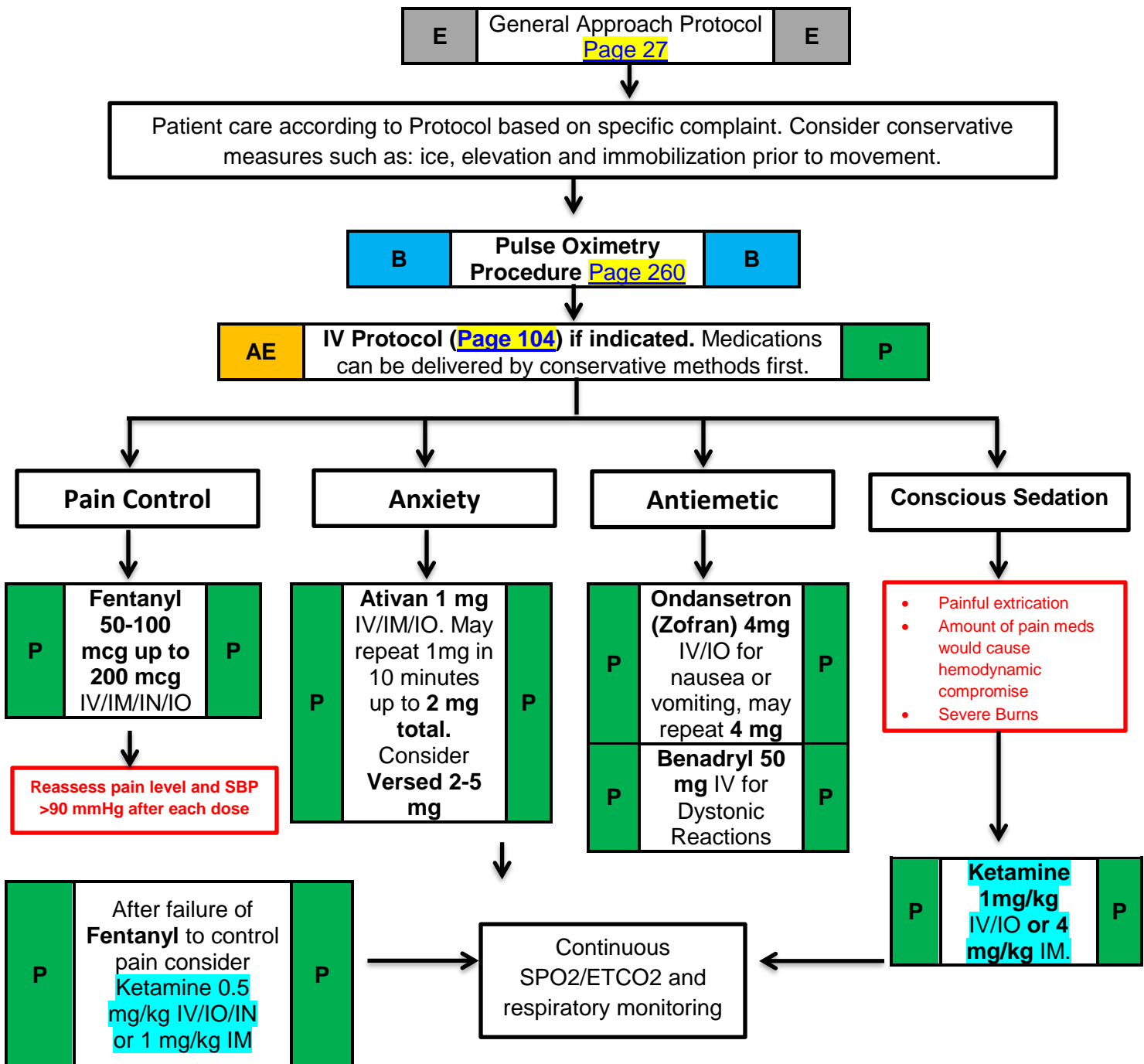
- IV Protocol [Page 104](#)
- If clinically hypovolemic (orthostatic hypotension / dry mucous membranes) **IV bolus 250ml x1.**
- If hypoglycemic (Blood glucose < 60 mg/dL) with IV access:
 - **Dextrose 12.5g-25g** IV or D10W 100mL IV
 - May repeat as needed every 5-10 minutes to blood glucose >100 mg/dL
- If hypoglycemic (Blood glucose < 60 mg/dL) without IV access:
 - **Glucose paste 15 g** or other oral glucose agent (e.g. orange juice) if patient alert enough to self-administer
- If hypoglycemic and unable to take oral glucose:
 - **Glucagon 1 mg** IM
- If Drug (narcotic) overdose suspected:
 - **Naloxone (Narcan) 2mg** IVP every 3 minutes
 - **If IV access has not been established, Naloxone (Narcan) 2 mg IN via mucosal atomizer device. 1 mg in each nare.**

Medical-Altered Mental Status

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Comfort Management



Medical-Comfort Management

Comfort Management

History:

- Age
- Location
- Duration
- Severity (1-10)
- Past Medical History
- Medications
- Drug allergies
- Medications taken prior to arrival

Signs and Symptoms:

- Severity (pain scale)
- Quality
- Radiation
- Relation to movement, respiration
- Increased with palpation of area.

Differential:

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

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Patient Care Protocol [Page 27](#)
- Assess baseline pain level (0-10 scale: 0=no pain, 10=worst pain)
- Pulse Oximetry Procedure [Page 260](#)
- Continuously monitor ETCO2

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

Standing orders for the following pain treatment if patient is >12 years of age or >85 lbs

Pain:

- Common complaints:
 - Trauma/isolated extremity injury
 - Burns (without airway, breathing or circulation compromise)
 - Sickle crisis
 - Acute Chest Pain, in accordance with the Chest Pain protocol
 - Kidney stone highly suspected, administer **Toradol 30 mg IV, 60 mg IM (TORADOL IS CONTRAINDICATED FOR PATIENTS ON BLOOD THINNERS)**
- Consider conservative methods such as: ice, elevation and immobilization prior to movement.
- **Fentanyl 50-100 mcg** slow IV/IO/IM/IN every 5 minutes until pain relief achieved (**Maximum 200 mcg**) or consider **Ketamine 0.5 mg/kg IV/IO/IN or 1 mg/kg IM** after failure of Fentanyl to control pain.
 - Fentanyl Contraindicated if SBP <90 mmHg

Medical-Comfort Management

Comfort Management

- If available consider intranasal administration, same dose as above *divided between nares*.
- After each drug dosage administration
 - Reassess and document the patient's pain level (0-10 scale)
 - Note adequacy of ventilation and perfusion
 - Assess and document vital signs
 - Continuously monitor oxygen saturation

Anxiety:

- Anxiety and muscle relaxant
- **Ativan 1 mg** may repeat up to a max dose of 2 mg
- Consider **Versed: 2-5 mg** IV/IN/IM/IO
 - Contraindicated with SBP<90 mmHg, decreased LOC and respiratory depression.

Nausea:

- **Zofran 4 mg** IV/IO, may repeat **4 mg** if symptoms persist.
- Monitor for dystonia and restlessness
- Administer **50mg Benadryl** IV for dystonic reactions
 - Contraindications: Decreased LOC, hypotension, and respiratory depression.

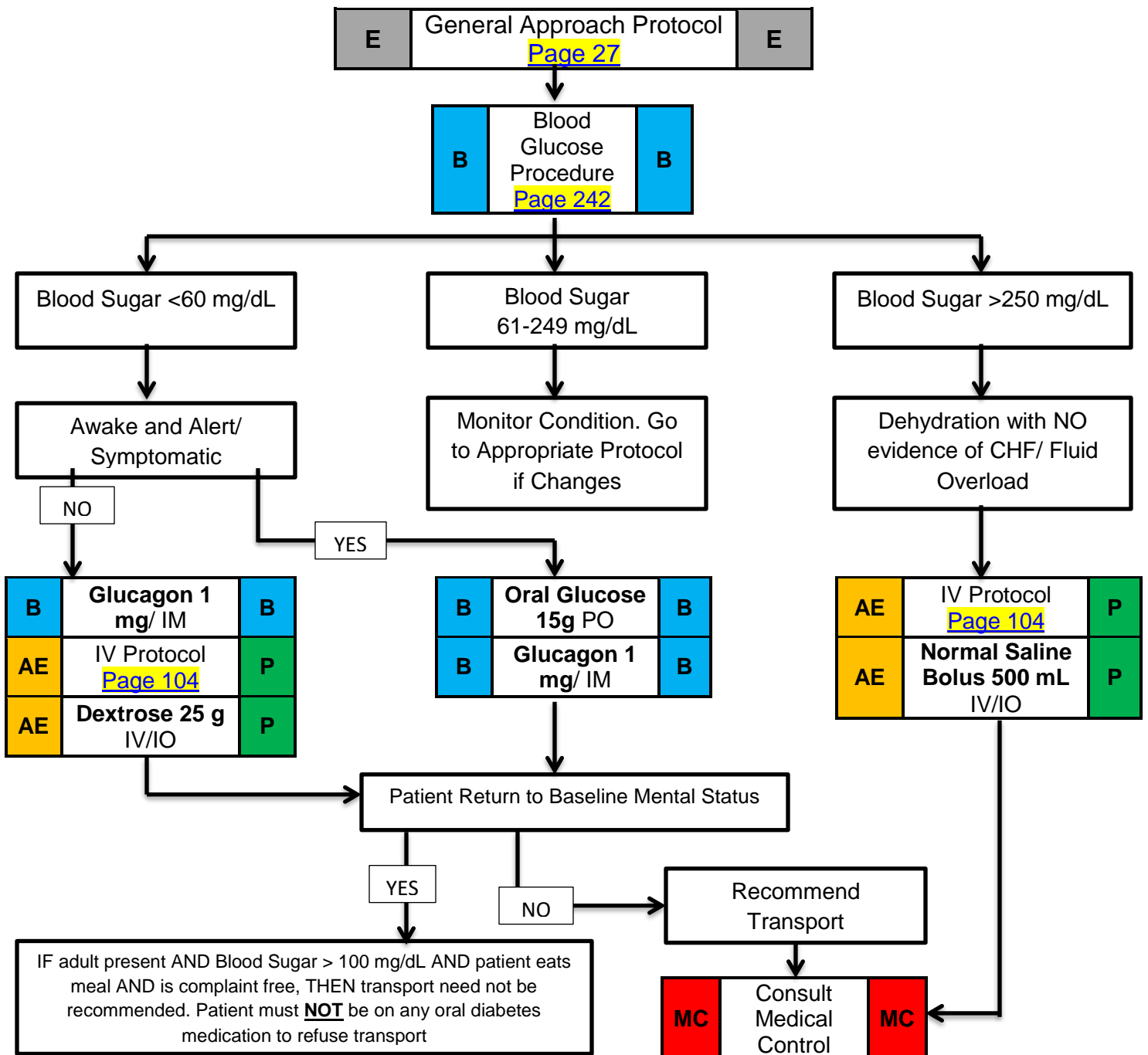
Conscious Sedation:

- Consider **KETAMINE 1 mg/kg IV/IO (4mg/kg IM)** for the following:
 - Painful Extrication from:
 - Motor Vehicle Collision
 - Industrial Accident
 - Building Collapse
 - Trench Rescue Situation
- Amount of pain medication/sedative required to provide comfort would potentially cause hemodynamic compromise.
- Severe burns

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Diabetic Emergencies Adult



Medical-Diabetic Emergencies

Diabetic Emergencies 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

Differential

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

Emergency Medical Responder

- Last oral intake
- Assess whether or not the patient is on diabetic medications, and if so, when was the last dose.
- Symptoms onset
- Is there a history of recent infections, poor food intake and/or vomiting?

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
 - If <60 mg/dL and patient is awake with an intact gag reflex, administer one tube (15g) of glucose
 - If <60 mg/dL and patient is unresponsive, administer **1 mg of Glucagon IM**

A-EMT-Perform/Confirm All above Interventions

Paramedic-Perform/Confirm All above Interventions

- IV Protocol [Page 104](#)
- If blood glucose >250 mg/dL administer **500 mL of normal saline IV/IO** if **no** evidence of CHF or fluid overload
- If blood glucose <**60** mg/dL and patient is unresponsive, administer **25 g of Dextrose 50 IV/IO** preferred site to be antecubital
- IO access if patient is critical, IV cannot be established in a reasonable time frame and the patient is not responsive to glucagon.
- Hypoglycemic patients may refuse transport once back to usual mental status, but are at risk to become symptomatic again. Consideration should be given to transport, especially if patient does not have someone to watch them. Recommend transport for patients who are prescribed oral diabetes medications. If there is any question regarding need for transport contact medical control.
- Refer to **Refusal-Hypoglycemia Protocol** [Page 144](#) if indicated

Medical-Diabetic Emergencies

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Dialysis/ Renal Failure

E	General Approach Protocol Page 27	E
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CHF/ Pulmonary Edema?

YES

Refer to Airway-CHF/
Pulmonary Edema Protocol
[Page 34](#)

NO

Cardiac Arrest?

YES

P	Calcium Chloride 1g IV/IO	P
P	Sodium BiCarb 50 mEq IV/IO	P

Refer to Appropriate
Cardiac Protocol

NO

Serious Signs & Symptoms Listed Above

YES

B	Blood Glucose Analysis	B
B	12 Lead EKG Procedure Page 225	B
AE	IV Procedure Page 269	P

<60 or >250
mg/dL

Refer to Diabetic
Emergency Protocol
[Page 94](#)

Hemodialysis in Past 4 hours

YES

SBP <90 mmHg?

NO

YES

Peaked T Wave & QRS >0.12 sec

YES

AE	NS Bolus 250 mL. Repeat as needed for goal of SBP 90 mm/Hg (Max 1 Liter) If lungs remain clear	P
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MC	Consult Medical Control	MC
----	----------------------------	----

P	Calcium Chloride 10 mL of 10% solution IV/IO	P
P	Sodium BiCarb 50 mEq IV/IO	P

Medical-Dialysis/ Renal Failure

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

Emergency Medical Responder

- General Patient Care Protocol-Adult [Page 27](#)
- Signs of CHF/Pulmonary Edema
 - If so refer to Airway-CHF/Pulmonary Edema Protocol [Page 34](#)
- Last hemodialysis and how much weight was taken off

Basic-Confirm/Perform All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
 - <60 or >250 Refer to Diabetic Emergency Protocol [Page 94](#)
- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Confirm/Perform All Above Interventions

- IV Protocol [Page 104](#)
- If hemodialysis was done in the past 4 hours and SBP is <90 mm/Hg
 - **Normal saline bolus of 250 mL.**
 - Repeat as needed for a goal of SBP 90 mm/Hg (Max 1 Liter) if lungs remain clear

Paramedic-Confirm/Perform All Above Interventions

- Refer to appropriate Cardiac Protocol
- If in cardiac arrest
 - **Calcium Chloride 10 mL of 10% solution IV/IO**
 - **Sodium BiCarb 50 mEq IV/IO**

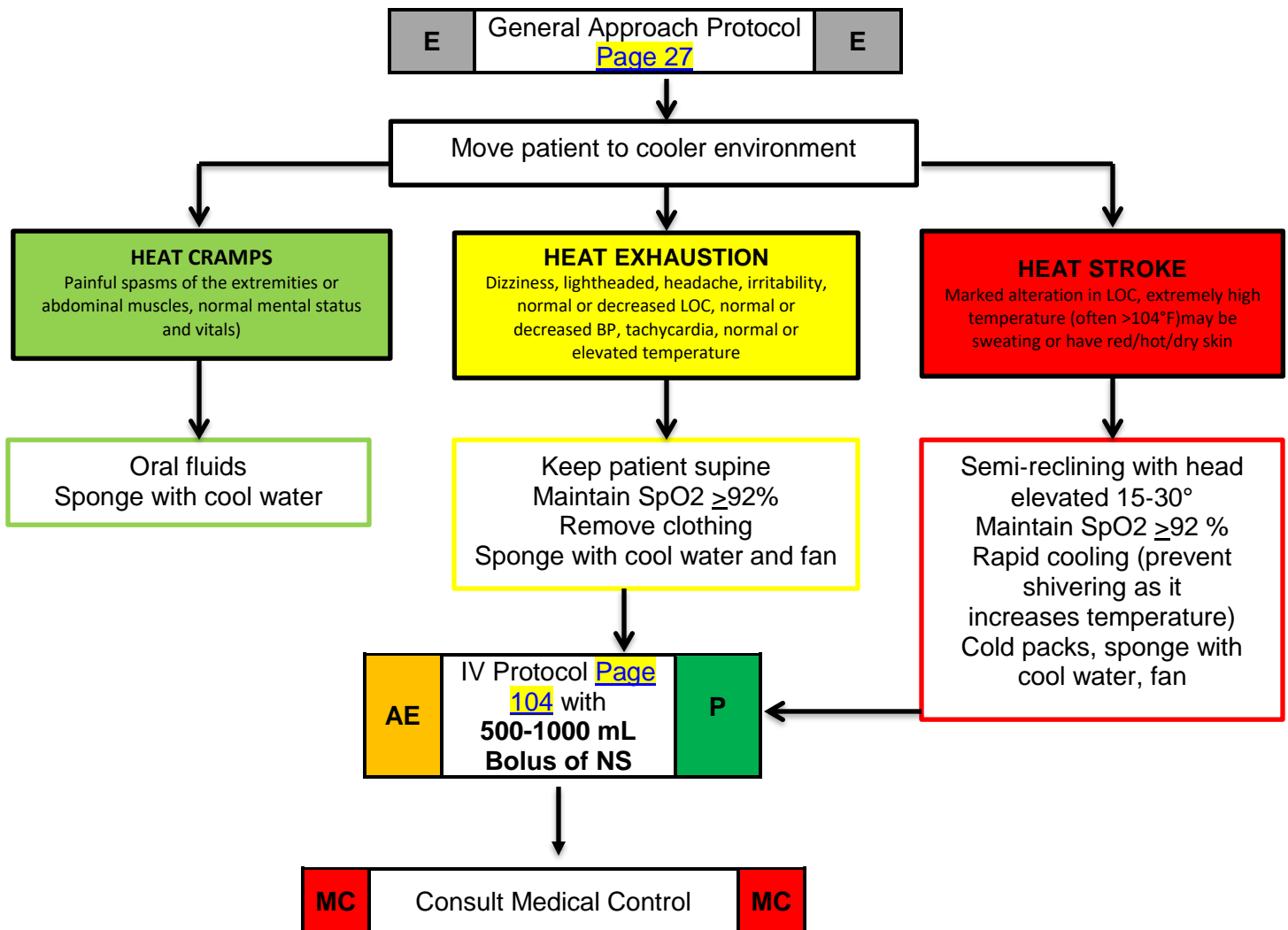
Contact Medical Control for the following symptom and treatment

- Peaked T waves and QRS > 0.12 seconds
 - **Calcium Chloride 10 mL of 10% solution IV/IO**
 - **Sodium BiCarb 50 mEq IV/IO**
 - Refer to appropriate Cardiac Protocol

Medical-Dialysis/ Renal Failure

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Hyperthermia



Medical-Hyperthermia

Hyperthermia

History:

- *Age
- *Exposure to increased temperatures and/or humidity
- *Past medical history / medication
- *Extreme exertion
- *Time and length of exposure
- *Poor PO intake
- *Fatigue and/or muscle cramping

Signs and Symptoms

- *Altered mental status or unconsciousness
- *Hot, dry or sweaty skin
- *Hypotension or shock
- *Seizures
- *Nausea

Differential

- *Fever (Infection)
- *Dehydration
- *Medications
- *Hyperthyroidism (Storm)
- *Delirium tremens (DT's)
- *Heat cramps
- *Heat Exhaustion
- *Heat stroke
- *CNS lesions or trauma
- *Overdose

HEAT CRAMPS

Painful spasms of the extremities or abdominal muscles, normal mental status and vitals)

HEAT EXHAUSTION

Dizziness, lightheaded, headache, irritability, normal or decreased LOC, normal or decreased BP, tachycardia, normal or elevated temperature

HEAT STROKE

Marked alteration in LOC, extremely high temperature (often >104°F) may be sweating or have red/hot/dry skin

- Oral fluids
- Sponge with cool water

- Keep patient supine
- Maintain SpO2 $\geq 92\%$
- Remove clothing
- Sponge with cool water and fan

- Semi-reclining with head elevated 15-30°
- Maintain SPO2 $\geq 92\%$
- Rapid cooling (prevent shivering as it increases temperature)
- Cold packs, sponge with cool water, fan

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach to All Adult Patients [Page 27](#)
- Move patient to cooler environment
- Follow colored criteria based on symptoms listed for each color
- Apply **Oxygen** to maintain SPO2 at 92%

A-EMT-Perform/Confirm All Above Interventions

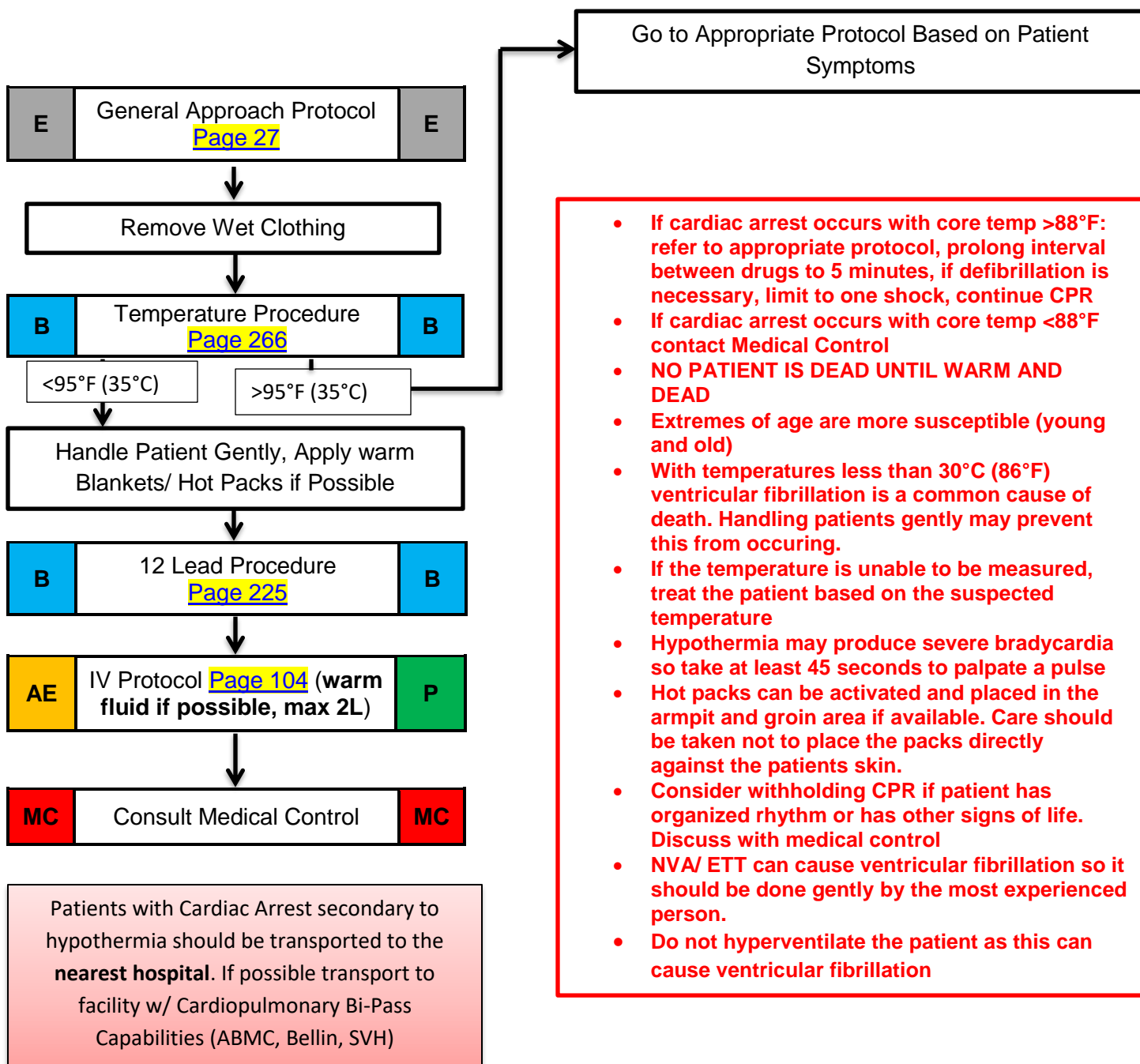
- IV Protocol ([Page 104](#)) with a **500-1000 mL Bolus of Normal Saline**

Medical-Hyperthermia

LEGEND

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Hypothermia



Medical-Hypothermia

Hypothermia

History:

- Past medical history
- Medications
- Exposure to environment even in normal temperatures
- Exposure to extreme cold
- Extremes of age
- Drug use: alcohol, barbiturates
- Infections / sepsis
- Length of exposure/ wetness

Signs and Symptoms

- Cold, clammy
- Shivering
- Mental status changes
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential

- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
- Stroke
- Head Injury
- Spinal Cord Injury

- If cardiac arrest occurs with core temp >88°F: refer to appropriate protocol, prolong interval between drugs to 5 minutes, if defibrillation is necessary, limit to one shock, continue CPR
- If cardiac arrest occurs with core temp <88°F contact Medical Control
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD**
- Extremes of age are more susceptible (young and old)
- With temperatures less than 30°C (86°F) ventricular fibrillation is a common cause of death. Handling patients gently may prevent this from occurring.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature
- Hypothermia may produce severe bradycardia so take at least 45 seconds 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.
- Consider withholding CPR if patient has organized rhythm or has other signs of life. Discuss with medical control
- Intubation can cause ventricular fibrillation so it should be done gently by the most experienced person.
- Do not hyperventilate the patient as this can cause ventricular fibrillation

Emergency Medical Responder

- General Patient Care Protocol—Adult [Page 27](#)
- Remove wet clothing
- Measure temperature, If < 95 degrees F (35C), handle gently
- Warm blankets/warm temperature

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

Medical-Hypothermia

Hypothermia

A-EMT-Perform/Confirm All above Interventions

- IV Protocol [Page 104](#)
 - If available, and no contraindications, **administer warmed 0.9% Normal saline (max 2L)**

Paramedic-Perform/Confirm All above Interventions

- If Cardiac Arrest occurs with a temp > 88 degrees F
 - Refer to appropriate protocol
 - Prolong interval between drugs to 5 minutes
 - If defibrillation is necessary, limit to one shock
 - Continue CPR
- If cardiac arrest with temp < 88 degrees F
 - Contact OLMC

Patients with Cardiac Arrest secondary to hypothermia should be transported to the **nearest hospital**. If possible transport to facility w/ Cardiopulmonary Bi-Pass Capabilities (ABMC, Bellin, SVH)

Medical-Hypothermia

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LEGEND		
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Intravenous Access

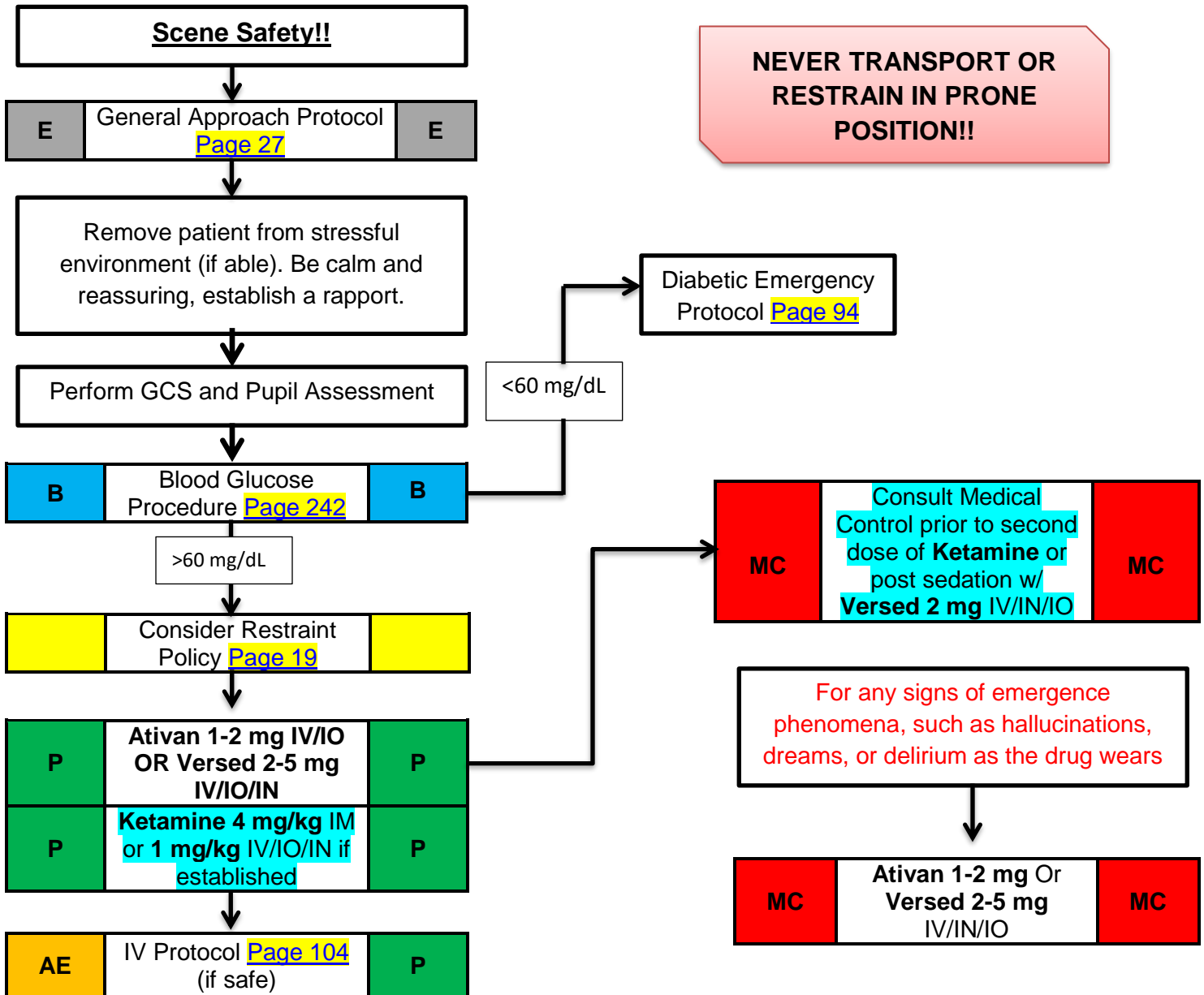
- Assess need for IV to administer IV Fluids, and/or medications in emergent or potentially emergent conditions.
- Peripheral IV is the access of choice, lower extremity peripheral IV should not be used in patients with vascular disease or diabetes.
- Place catheter per Venous Access Extremity, External Jugular (Paramedic ONLY) or Intraosseous Procedures.
- When possible utilize 20g or larger on medical patients and 16 gauge or larger in trauma or hypovolemic shock patients.
- Once access obtained, monitor infusion site, unless administering fluid boluses, either saline lock the catheter or place at TKO rate. In patients <6 years of age utilize Buretrol Tubing.
- If extremity IV attempts are unsuccessful, reconsider need for IV access. Consider other alternatives for medication delivery: IN, IM, Oral and/ or IO.
- If patient hypotensive, but alert and responsive to pain – consider external jugular vein IV access. External Jugular (Paramedic ONLY) is only indicated in patients >8 years of age.
- In post-mastectomy patients and patients with a working dialysis fistula, avoid IV attempts, blood draws, injections, and blood pressure measurements in the upper extremity on the affected side.
- If patient unstable, go directly to Intraosseous access.

Intravenous Access

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Psychiatric & Behavioral Emergencies



Medical-Psychiatric & Behavioral Emergencies

Psychiatric & Behavioral Emergencies

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

- See altered mental status differential
- Alcohol intoxication
- Toxin / substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia

NEVER TRANSPORT IN PRONE POSITION!!

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

SCENE SAFETY!!

- General Patient Care Protocol—Adult [Page 27](#)
- Remove patient from stressful environment (if able). Be calm and reassuring, establish a rapport
- Blood Glucose Measurement if < 60 mg/dl, refer to Diabetic Emergency Protocol [Page 94](#)
- Assess pupils
- Assess GCS. Apply physical restraints if needed to ensure patient/crew safety. Adhere to policy on Physical Restraint of Agitated Patients when this process is deemed necessary.

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol if safe to conduct [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

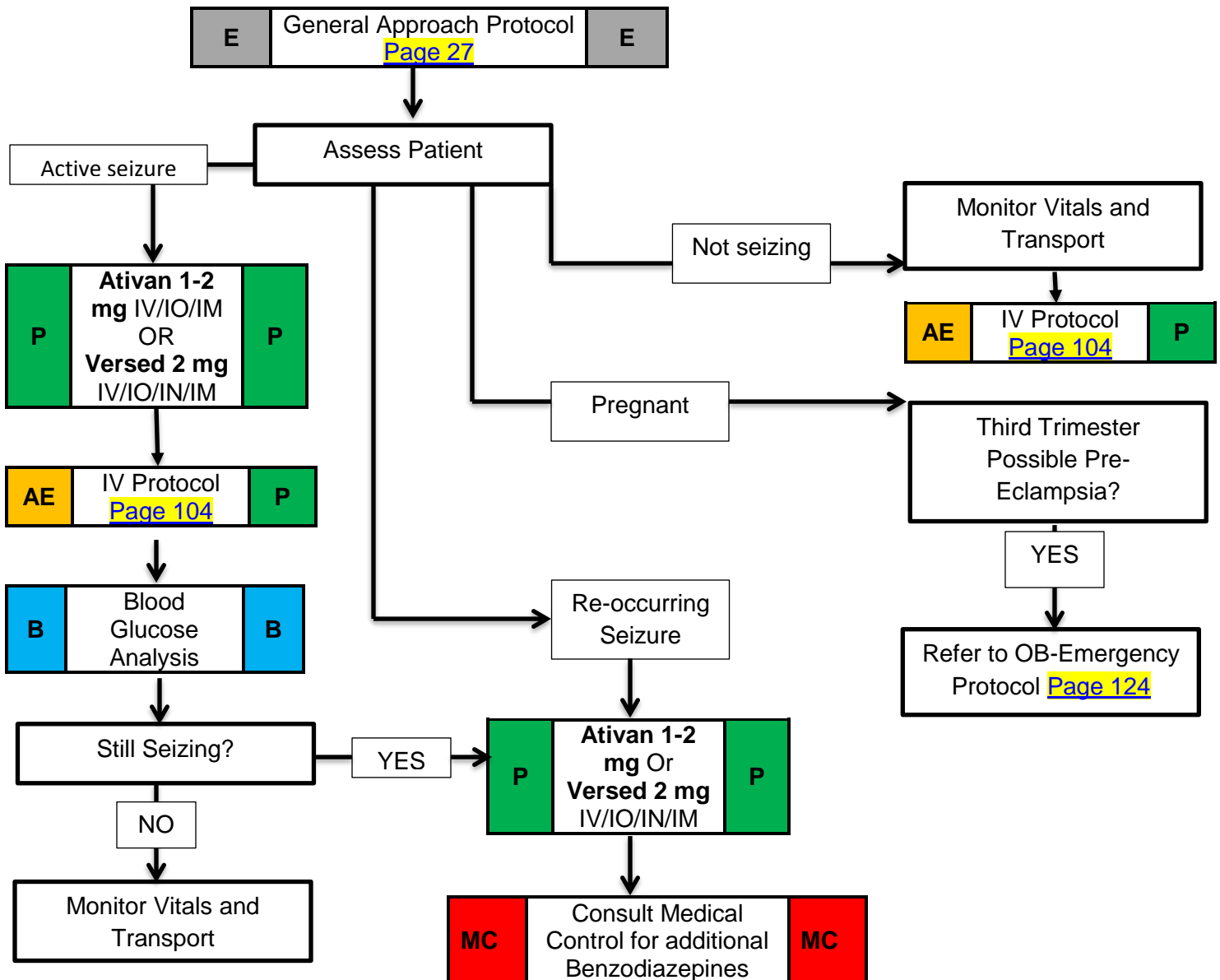
- If chemical restraint is deemed necessary for protection of the patient from self-harm, crew, and law enforcement, proceed with the following:
 - Administer **Ativan 1-2 mg IV/IO OR Versed 2-5 mg IV/IO/IN**
 - Administer **KETAMINE 1mg/kg IV/IO/IN or 4mg/kg IM.**
- Attempt to monitor vital signs if safety permits

- Provider may administer a second dose, only after contact with **MEDICAL CONTROL.**
- If post-ketamine sedation is necessary, **MEDICAL CONTROL** should be contacted with discussion of supplemental Versed.
- For any signs of emergence phenomena, such as hallucinations, dreams, or delirium as the drug wears off, contact **MEDICAL CONTROL** for administration of **Versed 2 mg IV**

Medical-Psychiatric & Behavioral Emergencies

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Seizure



Medical-Seizure

Seizure

History:

- Reported/witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of Trauma
- History of Diabetes
- History of Pregnancy

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

Emergency Medical Responder

- General approach Protocol [Page 27](#)
- If still seizing, protect patient from injury
 - Do not restrain the patient
 - Document closely type of seizure activity and eye deviation
- If postictal:
 - Avoid placing anything in the patient's mouth
 - Place in recovery position if no chance of spinal injury
 - Administer supplemental oxygen to maintain SPO2 >92 % via any manner tolerated by the patient. Often, postictal patients are combative and only tolerate blow-by oxygen.
- Identify pregnancy or recent (within 2 weeks) delivery for Eclampsia, notify incoming ambulance ASAP.

Basic-Perform/Confirm All Above Interventions

- Isolated seizures need no specific treatment other than provision of airway care with supplemental oxygen during postictal phase.
- Perform Blood Glucose Analysis and refer to Diabetic Emergencies Protocol ([Page 94](#)) if indicated.

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- Consider IN or IO if patient is actively seizing and unable to obtain IV access.
- Perform appropriate airway management based on patient condition.
- Administer either **Midazolam (Versed) 2 mg** or **Ativan 1-2 mg** slow IV push for repeated seizures or active seizures lasting greater than 1 minute.
- If IV access is not available and the patient continues to seize, **Ativan 1-2 mg** IV/IO/IM or **Midazolam (Versed) 2 mg** may be given IM/IN/IO as an alternative.
- If patient is in third trimester of pregnancy and suspected Eclampsia, Refer to OB-Emergency Protocol [Page 124](#)

Consult Medical Control for administration of 2 mg of Magnesium Sulfate over 15 minutes

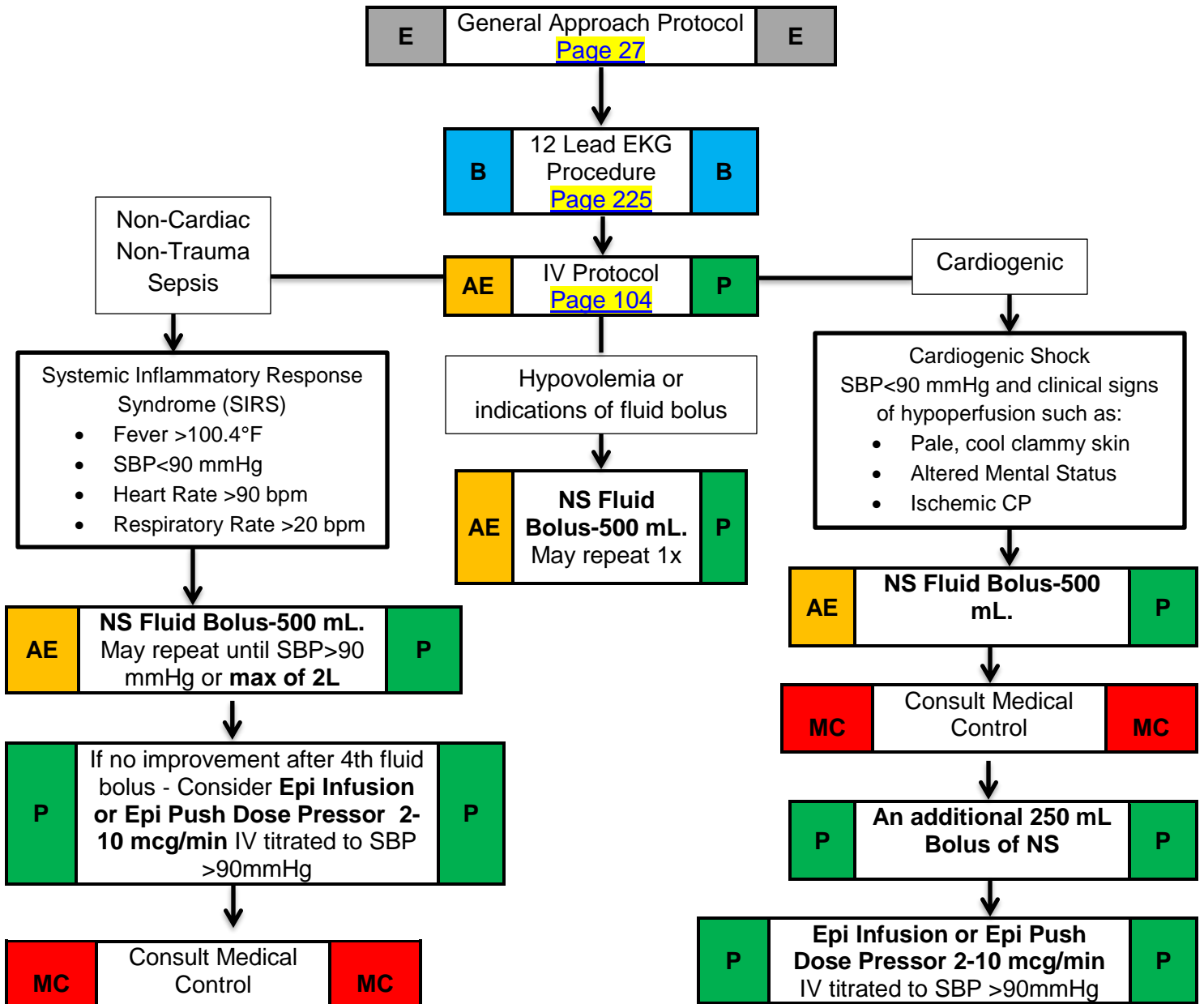
If seizures persists,

Consult Medical Control for administration of a total of 6 mg of Magnesium Sulfate

Medical-Seizure

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Shock (Non-Trauma)



Medical-Shock (Non Trauma)

Shock (Non-Trauma)

History:

- Blood loss- vaginal or gastrointestinal bleeding, AAA, ectopic pregnancy
- Fluid Loss- vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic Reaction
- Pregnancy

Signs and Symptoms:

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

Differential:

- Shock
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Toxic exposure

Shock is defined as a state of inadequate organ perfusion and tissue oxygenation. It is evidenced by the presence of any of the following signs and symptoms:

Hypotension	Mottled skin appearance
Narrow pulse pressure	Diaphoresis
Tachypnea	Cool clammy skin
Tachycardia	Pallor
Delayed capillary refill	Altered mental status

Signs and symptoms vary depending upon the stage of shock, which may be compensated (normal perfusion maintained) or decompensated (unable to maintain normal perfusion).

Categories of shock

- **Obstructive shock:** Caused by an obstruction that interferes with return of blood to the heart (e.g. tension pneumothorax, cardiac tamponade, massive pulmonary embolus)
- **Hypovolemic shock:** Caused by decreased blood or water volume. Hypovolemic shock may be hemorrhagic or non-hemorrhagic
- **Distributive shock:** Caused by abnormal distribution of blood resulting from vasodilation, vasopermeability or both. Distributive shock may result from anaphylactic reactions, sepsis, or spinal cord injury
- **Cardiogenic shock:** Caused as a result of cardiac pump failure, usually secondary to severe Left Ventricular failure. May result from massive MI

Perform the following in conjunction with protocols that apply to the specific etiology of the shock state (e.g. allergic reactions, STEMI, etc.):

Emergency Medical Responders

- General Approach Protocol [Page 27](#)

Medical-Shock (Non-Trauma)

Shock (Non-Trauma) Cont.

Basic-Confirm/Perform All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Non-Cardiac, Non-Trauma, Sepsis

Systemic Inflammatory Response Syndrome (SIRS)

- Fever $>100.4^{\circ}\text{F}$
- SBP <90 mmHg
- Heart Rate >90 bpm
- Respiratory Rate >20 bpm
- **NS Fluid Bolus-250 mL.** May repeat until SBP >90 mmHg or **max of 2L**

Paramedic-Perform/Confirm All Above Interventions

- If no improvement after 4th fluid bolus - Consider **Epi Infusion or Epi Push Dose Pressor 2-10 mcg/min** IV titrated to SBP >90 mmHg

Cardiogenic:

SBP <90 mmHg and clinical signs of hypoperfusion such as:

- Pale, cool clammy skin
- Altered Mental Status
- Ischemic CP

- **NS Fluid Bolus-500 mL.**

Contact Medical Control in regards to the following treatment options

- An additional **250 mL Bolus of NS**
- **Epi Infusion or Epi Push Dose Pressor 2-10 mcg/min** IV titrated to SBP >90 mmHg

Hypovolemia or indication of a fluid bolus:

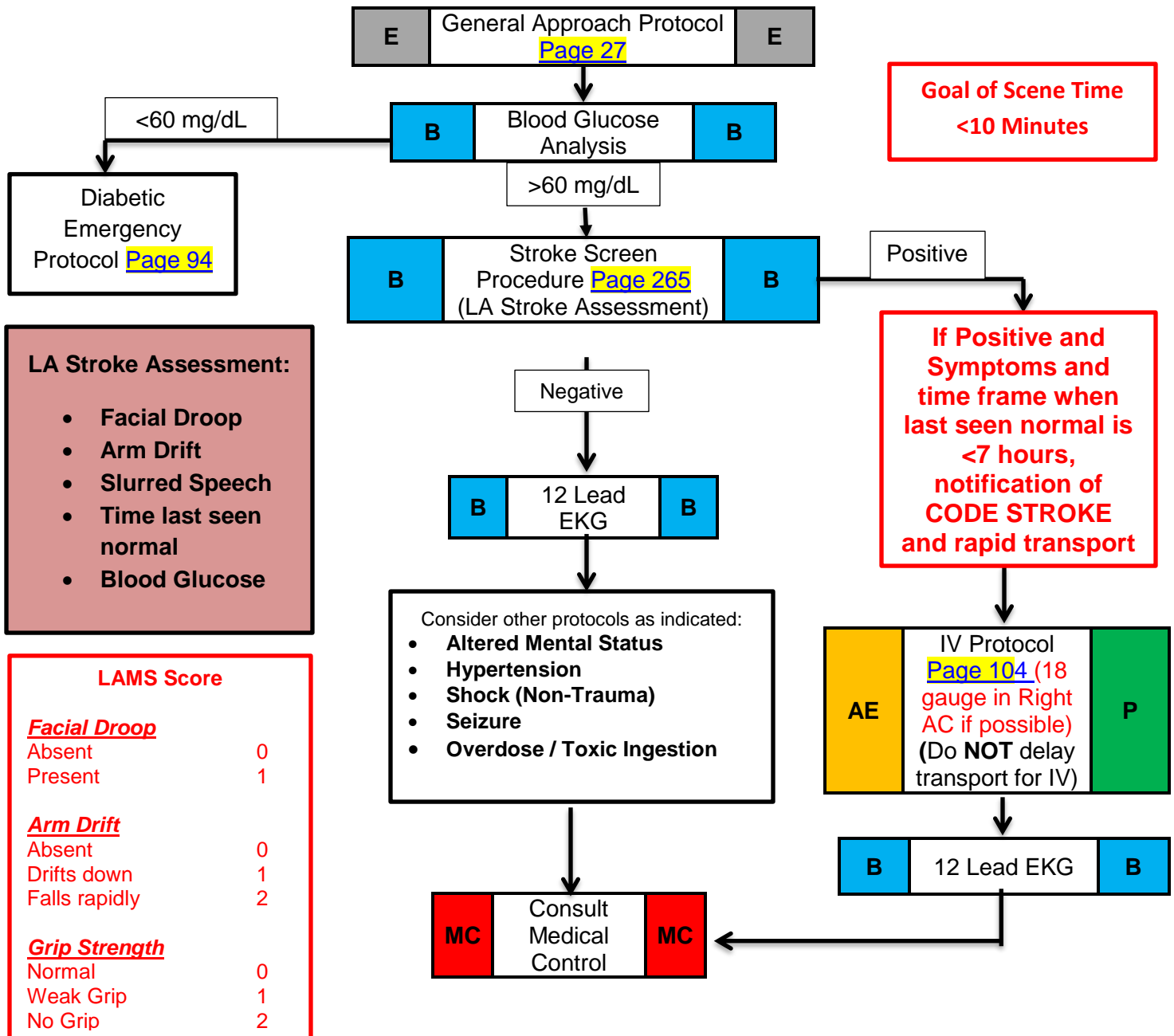
- **500 mL bolus of NS**
 - May repeat 1x if indicated

Medical-Shock (Non-Trauma)

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Suspected Stroke



Medical-Suspected Stroke

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
- Hypoglycemia
- Stroke
- Thrombotic Embolic (~85%)
- Hemorrhagic (~15%)
- Tumor
- Trauma

Early recognition and transport of stroke is essential to good patient outcomes. Any patient presenting with a normal blood glucose (> 60 mg/dL), a positive LA Pre-Hospital Stroke Screen, LAMS score of 4 or more, and onset of symptoms (when last seen normal) less than 7 hours should have early notification of the stroke center (**CODE STROKE**) and rapid transport.

GOAL OF ON SCENE TIME LESS THAN 10 MINUTES

Emergency Medical Responder

- General Patient Care Protocol-Adult [Page 27](#)
- Supplemental oxygen via nasal cannula only if O2 saturation < 92%
- Give nothing by mouth (oral glucose is permitted if patient is able to self-administer)
- Document LA Pre-Hospital Stroke Screen
- If patient blood glucose is >60 mg/dl, LA Pre-Hospital Stroke Screen is positive and onset of symptoms (when last seen normal) is < 7 hours, immediately notify incoming ambulance of a possible (**CODE STROKE**)

Basic-Perform/Confirm All Above Interventions

- Check Blood Glucose
 - If <60 mg/dL, **1 tube or 15 g of Oral Glucose** if patient is able to self-administer
- If hypoglycemic and patient not able to self-administer Oral Glucose
- **1 mg Glucagon IM** if blood glucose is <60 mg/dL
 - 12 Lead EKG Procedure [Page 225](#)

Medical-Suspected Stroke

Suspected Stroke

A-EMT-Perform/Confirm All Above Interventions

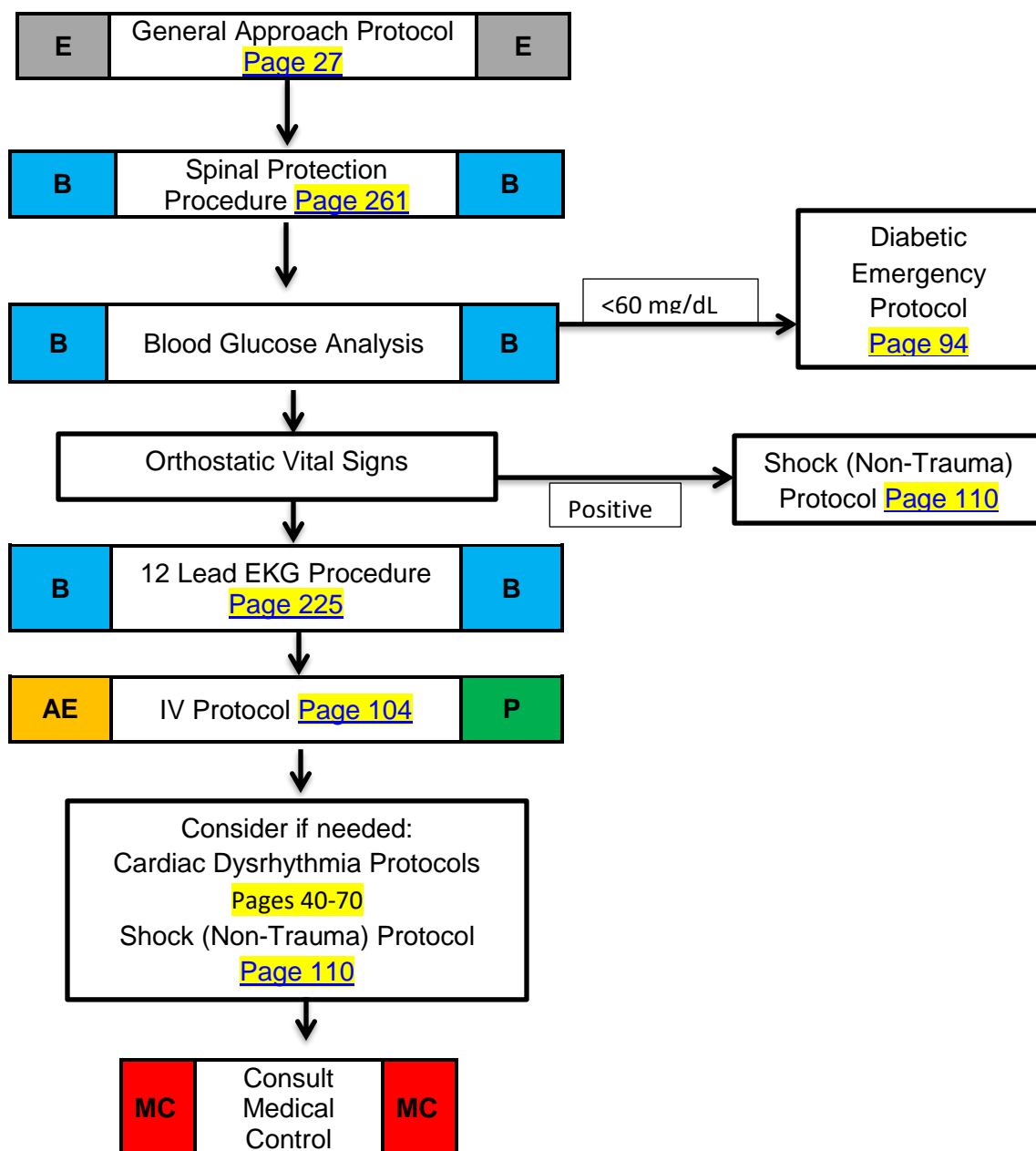
- IV Protocol [Page 104](#) (18 gauge RIGHT AC if possible)
- Consider following protocols if indicated
 - Altered Mental Status [Page 86](#)
 - Diabetic Emergency [Page 94](#)
 - Hypertension [Page 54](#)
 - Shock (Non-traumatic) [Page 110](#)
 - Seizure [Page 108](#)
 - Overdose/ Toxic Ingestion [Page 130](#)

Medical-Suspected Stroke

Left Blank

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Syncope



Medical-Syncope

Syncope

History:

- Presyncopal symptoms
- Occult blood loss (GI, ectopic)
- LMP, vaginal bleeding
- Nausea, vomiting, diarrhea
- Chest pain/palpitations
- Shortness of breath
- PMHx: Cardiac, CVA, Sz
- New medications

Signs & Symptoms:

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

Differential:

- Vasovagal
- Hypotension/Shock
- Cardiac syncope
- Micturition / Defecation syncope
- Stroke
- Hypoglycemia
- Seizure
- Toxicological
- Medication effect (hypotension)

Emergency Medical Responder

- General Patient Care Protocol-Adult [Page 27](#)
- Orthostatic Vital Signs

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
 - If hypoglycemic refer to Diabetic Emergency Protocol [Page 94](#)
- 12 Lead EKG Procedure if indicated [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- Spinal Protection Procedure [Page 261](#)

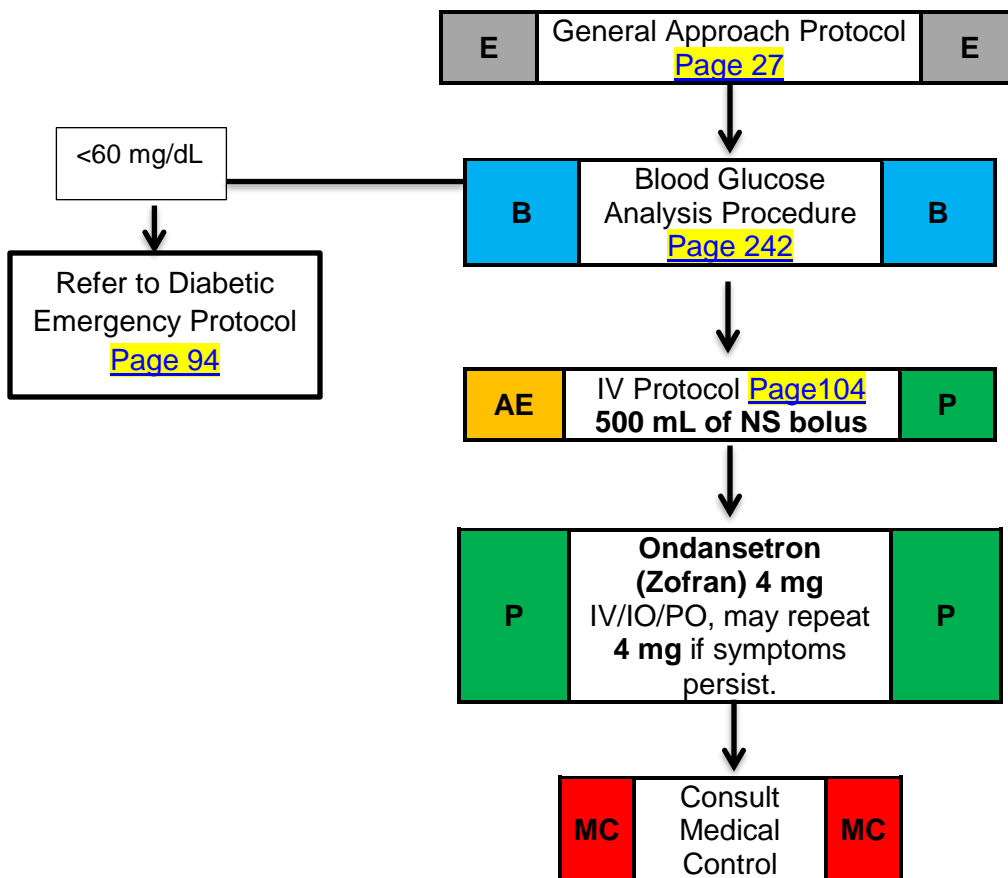
Paramedic-Perform/Confirm All Above Interventions

- Consider if needed:
 - Cardiac Dysrhythmia Protocols [Pages 40-70](#)
 - Shock (Non-Trauma) Protocol [Page 110](#)
 - Diabetic Emergency Protocol [Page 94](#)

Medical-Syncope

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Vomiting and Diarrhea



Medical-Vomiting & Diarrhea

Vomiting and Diarrhea

History:

- 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
- LMP / Pregnancy
- Travel history
- Bloody Emesis or diarrhea
- Untreated water
- Suspected food poisoning

Signs and Symptoms:

- Fever
- Pain
- Constipation
- Diarrhea
- Anorexia
- Hematemesis

Differential:

- CNS (Increased pressure, headache, stroke, CNS Lesions, trauma or hemorrhage),
- Vestibular
- AMI
- Drugs (NSAIDs, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic Ketoacidosis
- Uremia
- Gynecologic disease (Ovarian Cyst / PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or Toxin induced
- Pregnancy

Emergency Medical Responder

- General Approach to All Patients-Adult [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- **Blood Glucose Analysis** Procedure [Page 242](#)
 - If blood glucose <60 mg/dL or >250 mg/dL refer to **Diabetic Emergency Protocol** [Page 94](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- **500 mL bolus of normal saline** if no signs of CHF or fluid overload

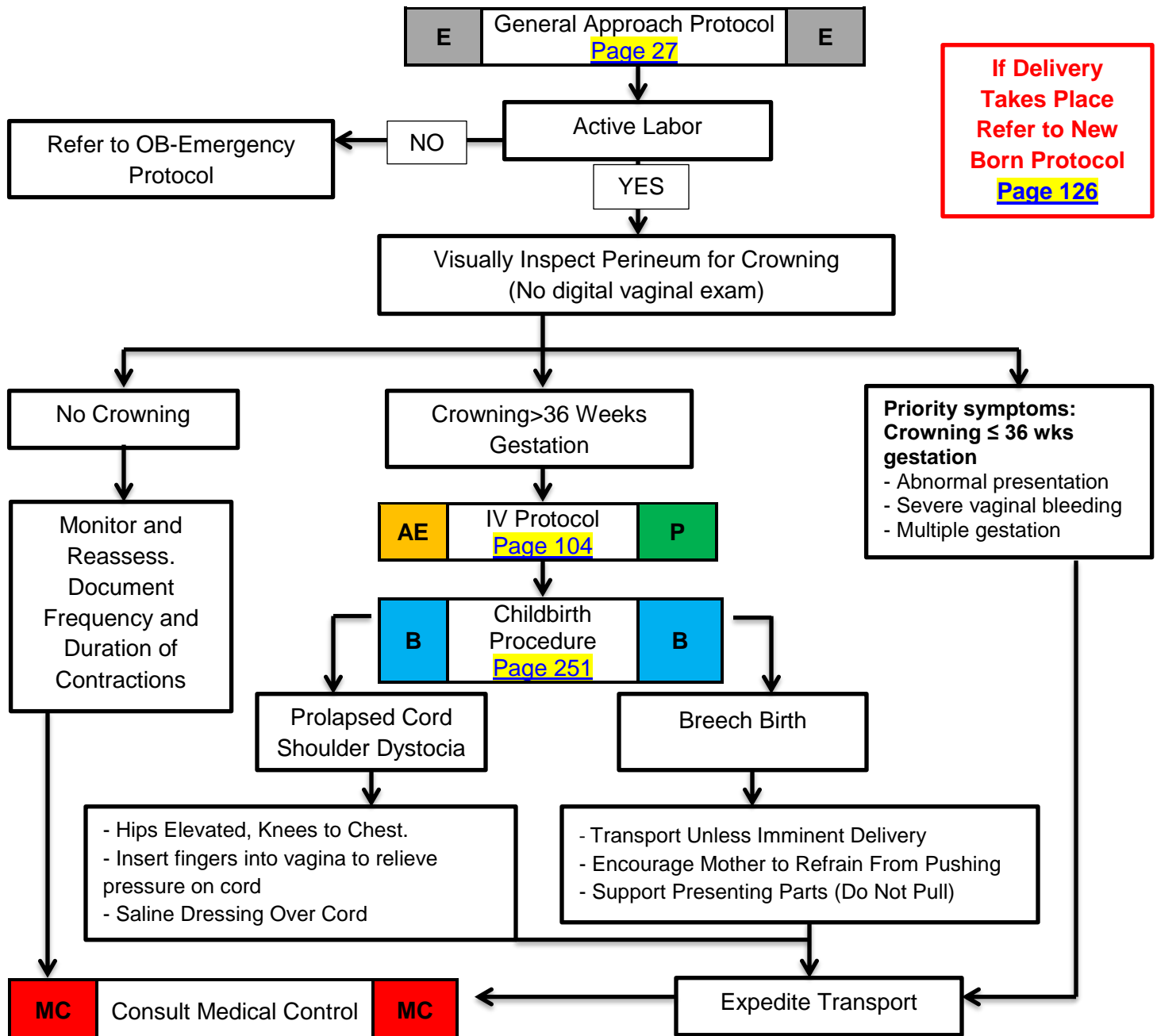
Paramedic-Perform/Confirm All Above Interventions

- **4mg of Ondansetron (Zofran)** IV/IO/PO for nausea and/or vomiting, may repeat **4 mg** if symptoms persist.

Medical-Vomiting & Diarrhea

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

OB-Childbirth/ Labor



OB-Childbirth/ Labor

OB-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

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- Supplemental oxygen
- Do not place fingers or hand inside the birth canal for assessment
- If active labor refer to Childbirth Procedure [Page 251](#)
- If no active labor but presenting symptoms refer to OB Emergency Protocol [Page 124](#)
- If presenting part is not the head (i.e., foot-, arm-, or buttock-first), immediately begin transport to the nearest OB receiving facility while further care continues
- Contact Medical Control
- If delivery takes place refer to Newborn Protocol [Page 126](#)

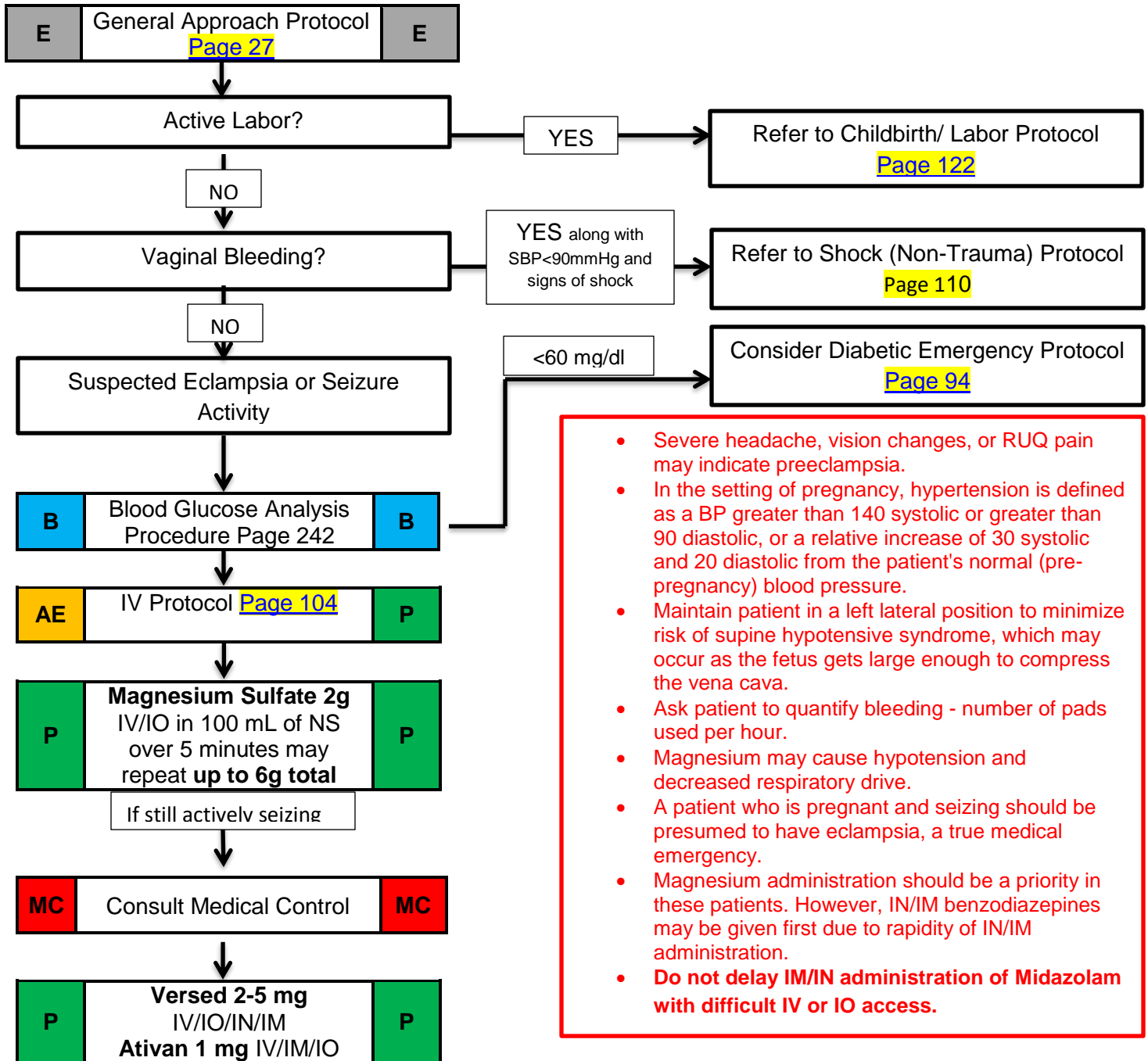
A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

OB-Childbirth/ Labor

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

OB Emergency



- 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, which may occur as the fetus gets large enough to compress the vena cava.
- Ask patient to quantify bleeding - number of pads used per hour.
- Magnesium may cause hypotension and decreased respiratory drive.
- A patient who is pregnant and seizing should be presumed to have eclampsia, a true medical emergency.
- Magnesium administration should be a priority in these patients. However, IN/IM benzodiazepines may be given first due to rapidity of IN/IM administration.
- **Do not delay IM/IN administration of Midazolam with difficult IV or IO access.**

OB Emergency

OB Emergency

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

- 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, which may occur as the fetus gets large enough to compress the vena cava.
- Ask patient to quantify bleeding - number of pads used per hour.
- Magnesium may cause hypotension and decreased respiratory drive.
- A patient who is pregnant and seizing should be presumed to have eclampsia, a true medical emergency.
- Magnesium administration should be a priority in these patients. However, IM/IN benzodiazepines may be given first due to rapidity of IM/IN administration.
- **Do not delay administration of Midazolam/Ativan with difficult IV or IO access.**

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- If vaginal bleeding and a SBP<90 mmHg and signs of shock, refer to Shock (Non-Trauma) Protocol [Page 110](#)
- Suspect Eclampsia or Seizure Activity refer to below and Seizure Protocol [Page 108](#)
- Blood Glucose Analysis Procedure [Page 242](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- For suspected eclampsia or seizure activity, **Magnesium Sulfate 2 g IV/IO** in 100 mL of NS over 5 minutes. May repeat to a total of **6 grams** total.

Contact Medical Control for the consideration of the following below

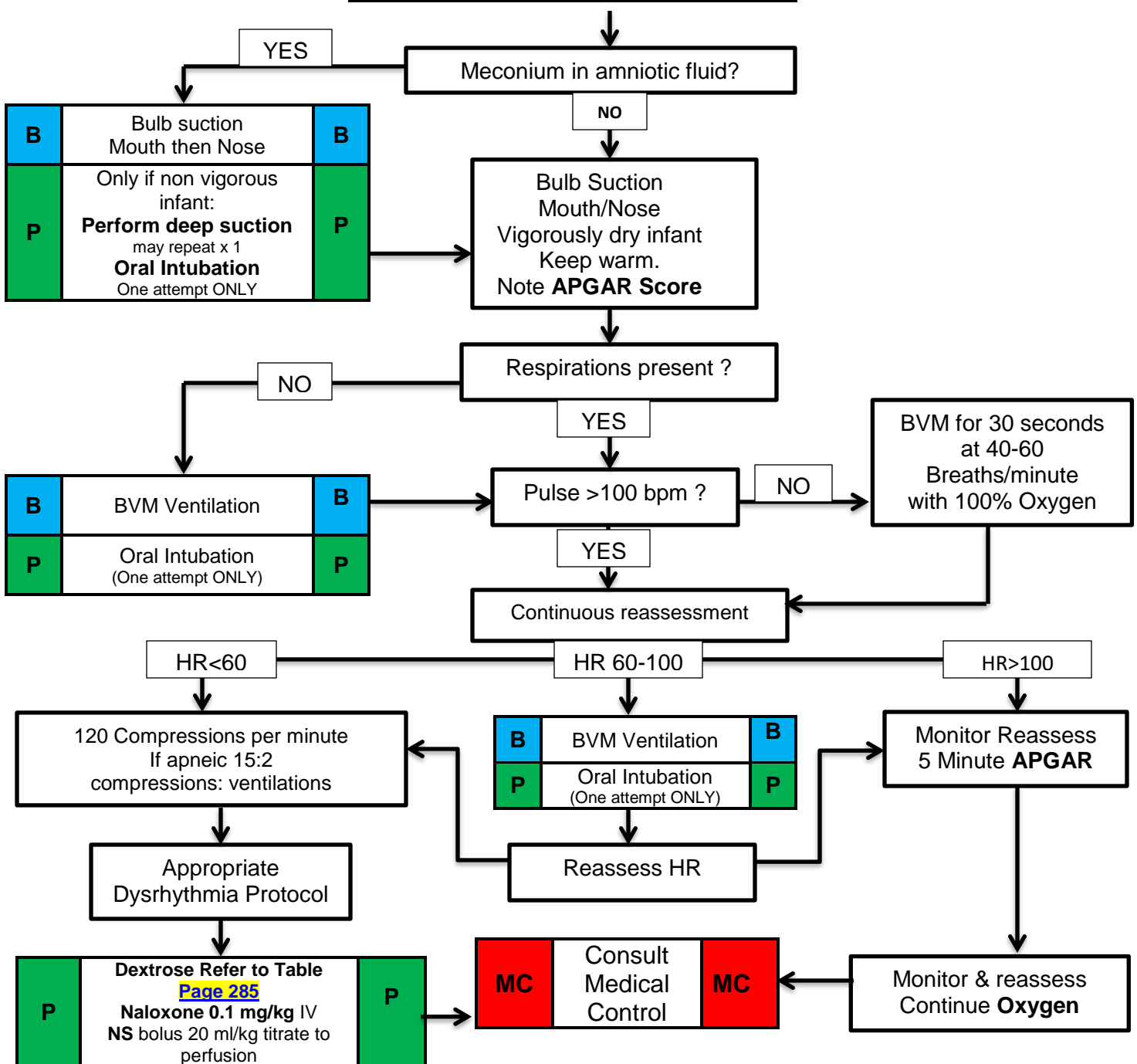
- If still actively seizing after Magnesium Sulfate infusion
 - **Midazolam (Versed) 5 mg IV, IO, IN, IM OR Ativan 1 mg IV, IM, IO**

OB Emergency

OB Newborn

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

E	General Approach Protocol-Pediatric Page 168	E
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OB-Newborn Protocol

OB Newborn

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

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach Pediatric Protocol [Page 168](#)
- Note gestational age, and if twin gestation is known
- Assess for presence of meconium
- Assess breathing or presence of crying
- Assess muscle tone
- Assess color
- Provide warmth
- Open airway and suction with bulb syringe as soon as infant is delivered.
- Suction mouth first then nasopharynx
- Dry, stimulate and reposition
- Evaluate respirations, heart rate and color
- Administer supplemental blow-by oxygen
- If apnea or HR < 100, provide positive pressure ventilation using BVM and supplemental oxygen
- If HR remain < 60, begin chest compressions
- Note APGAR scores at 1 and 5 minutes after birth and then sequentially every 5 minutes until VS have stabilized

	Sign	0	1	2	1min	5min
A	Appearance (Skin Color)	Blue or Pale	Pink Trunk Extremities blue	Pink throughout		
P	Pulse Rate	Absent	<100/min	>100/min		
G	Grimace (Irritability)	No response	Grimace, Crying, Some Motion	Strong Crying Vigorous		
A	Activity (Muscle Tone)	Limp	Some extremity flexion	Active, Good Extremity Motion		
R	Respirations (Respiratory Effort)	Absent	Slow or irregular	Normal, crying		
	Total Score					

OB-Newborn Protocol

OB Newborn

Paramedic-Perform/Confirm All Above Interventions

- If the fluid contains meconium and the newborn has absent or depressed respirations, decreased muscle tone or heart rate < 100 bpm, suction any visible meconium from the airway – refer to Childbirth Complication Procedure as appropriate [Page 252](#)
- After suctioning, apply positive pressure ventilation using a BVM and 100% oxygen
- If apnea, or HR < 100, provide positive pressure ventilations with 100% oxygen
- If HR 60-100, and no increase with positive pressure ventilations with 100% oxygen continue assisted ventilations
- Begin chest compressions
- **Naloxone (Narcan) 0.1 mg/kg**, IV/IO if respiratory depression in a newborn of a mother who received narcotics within 4 hours of delivery, use caution in infants born to opiate addicted mothers
- May Repeat **Naloxone (Narcan)** dose as needed to a **max of 0.03 mg/kg**
- Check blood glucose and treat glucose < 40 mg/dL
- **Dextrose 10% at 4 ml/kg** [Reference Chart Page 285](#)
- If HR < 60 begin chest compressions
- **IV 0.9% NaCl** KVO or lock
- If no IV access obtained after 1 attempt, obtain IO access [Page 274](#)

	Sign	0	1	2	1min	5min
A	Appearance (Skin Color)	Blue or Pale	Pink Trunk Extremities blue	Pink throughout		
P	Pulse Rate	Absent	<100/min	>100/min		
G	Grimace (Irritability)	No response	Grimace, Crying, Some Motion	Strong Crying Vigorous		
A	Activity (Muscle Tone)	Limp	Some extremity flexion	Active, Good Extremity Motion		
R	Respirations (Respiratory Effort)	Absent	Slow or irregular	Normal, crying		
	Total Score					

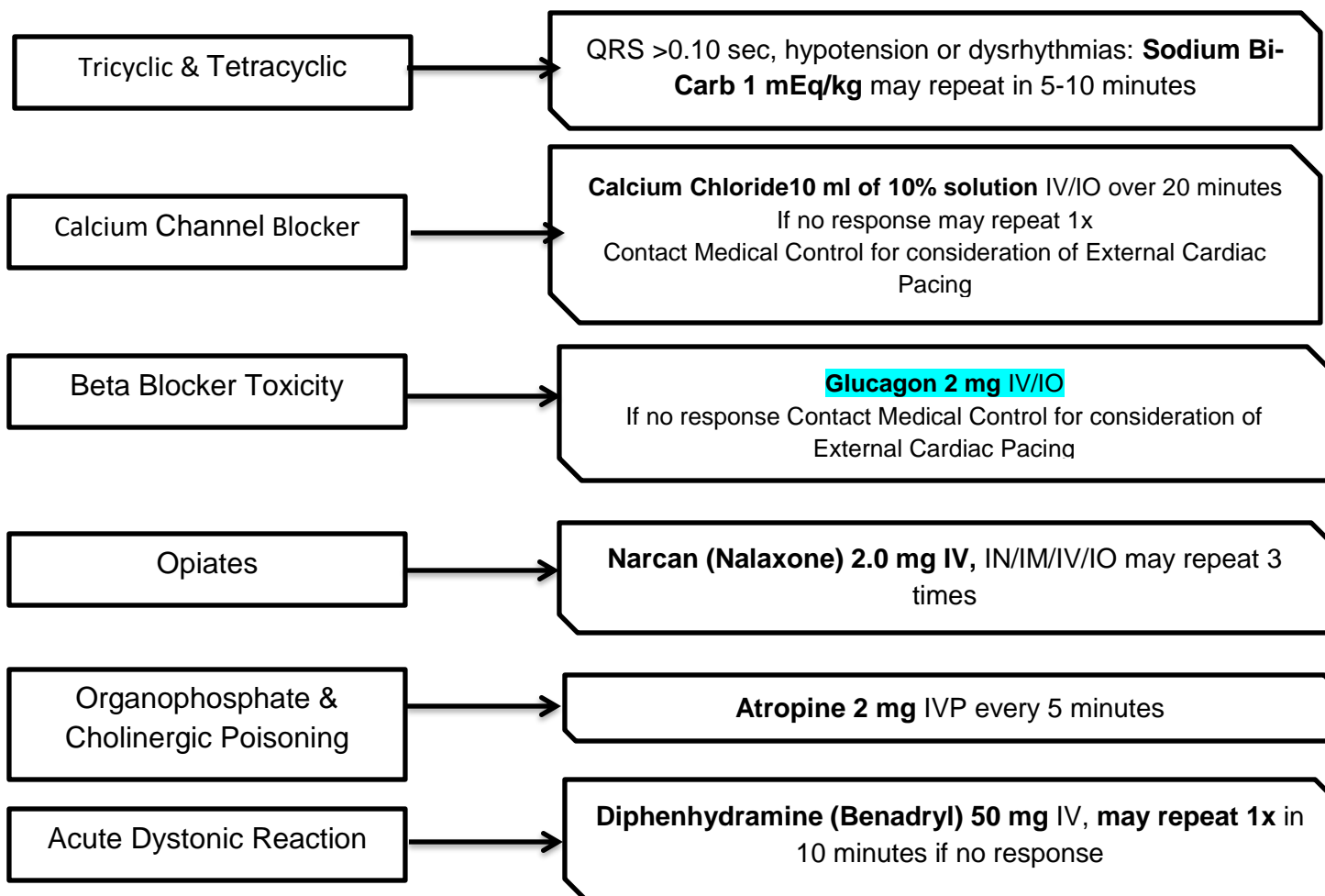
OB-Newborn Protocol

Equipment	Infant (4-8kg)	Small Child (8-10kg)	Small Child (10-12)	Child (12-14kg)	Child (14-18kg)	Child (18/24kg)
BP Cuff	Newborn- Infant	Infant/Child	Infant/Child	Child	Child	Child
IV Catheter	22-24	22-24	20-24	18-20	18-20	18-20
Intraosseous	18g	18g	18-15g	15g	15g	15g
Oral Airway	40	40-50	50-60	50-60	60-70	70-80
BVM	Infant	Infant	Child	Child	Child	Child
O2 Mask	Newborn	Newborn	Pediatric	Pediatric	Pediatric	Pediatric
Laryngoscope Blade (size/type)	Straight (0-1)	Straight (1)	Straight (1)	Straight or Curved (1-2)	Straight or Curved (2)	Straight or curved (2)
ET TUBE all uncuffed	Preterm (2.5) Term (3.0 or 3.5)	3.5-4.0	4.0-4.5	4.5	5.0	5.5
ETT Stylet	6F	6F	6F	6F	6F	14F
ETT length (cm @ the lip)	9-10.5	11-12	12.5-12.5	12.5-13.5	14-15	15.5-16.5
ET Suction Catheter	6F	8F	8F	8F	10F	10F
Defib. Pads	Pediatric until 1yr of 10kg	Pediatric or Adult When >1yr or >10kg	Pediatric or Adult When >1yr or >10kg	Adult	Adult	Adult

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Overdose

E	General Approach Protocol Page 27	E
B	12 Lead EKG Page 225	B
AE	IV Protocol Page 104	P

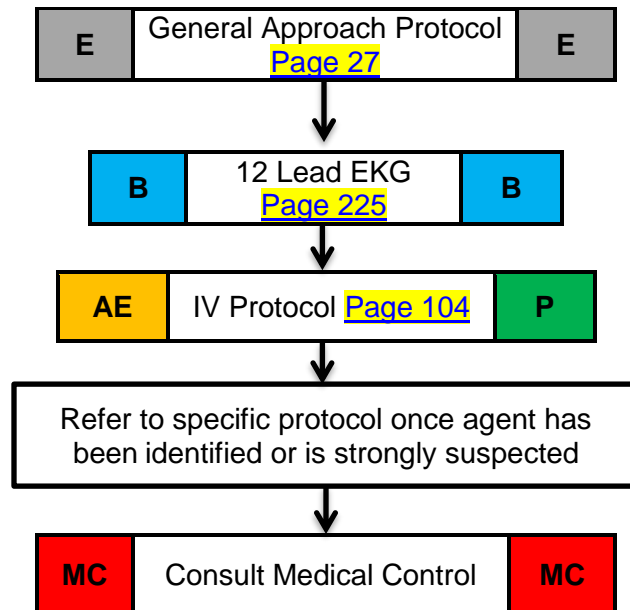


Overdose

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Overdose/ Toxic Ingestion



Bring bottles, contents, and emesis to ED

Tricyclic: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert 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 metal 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

Consider contacting poison control center for advice 1-800-222-1222

Overdose Protocol

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
- Post medical history, medications

Signs and Symptoms

- Mental Status Changes
- Hypotension / Hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- Pupils

Differential

- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, alcohols, cleaning agents
- Insecticides (organophosphates)

Bring bottles, contents, and emesis to ED

Tricyclic: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert 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

Consider contacting poison control center for advice 1-800-222-1222

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach to All Patients-Adult [Page 27](#)
- Refer to specific protocol once agent has been identified or is strongly suspected
- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Overdose-Toxic Ingestion

Overdose-Antipsychotics & Acute Dystonic Reaction

Examples of commonly used medications that may result in acute dystonic reactions:

- Haloperidol
- Prolixin
- Thorazine
- Prochlorperazine (Compazine)
- Promethazine (Phenergan)

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach Protocol Page 26

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- Diphenhydramine (Benadryl) 50 mg IV

Overdose-Acute Dystonic & Antipsychotic

Overdose-Beta Blocker Toxicity

Single Agent Medication	Combination Medication
<ul style="list-style-type: none">• Propranolol (Inderal)• Atenolol (Tenormin)• Metoprolol (Lopressor, Toprol)• Nadolol (Corgard)• Timolol (Blocadren)• Labetolol (Trandate)• Esmolol (Brevibloc)	<ul style="list-style-type: none">• Corzide (Nadolol/bendroflumethlazide)• Inderide (Propranolol/HCTZ)• Lopressor HCT (Metoprolol/HCTZ)• Timolide (Timolo/HCTZ)• Ziac (Bisoprolol/HCTZ)• Tenoretic (Atenolol/Chlorthalidone)

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

Criteria for cardiovascular toxicity is defined by:
Chest Pain, SBP<90mmHg, **or** Altered Mental Status

AND

HR<60 or 2nd **or** 3rd degree heart blocks.

If the previous symptoms are presenting follow flow chart below

- Administer **Glucagon 2 mg** IV/IO
 - If vomiting after **Glucagon**, administer **Ondansetron (Zofran) 4 mg** IV

Contact Medical Control for consideration of the following:

- If no response refer to and begin External Cardiac Pacing Procedure [Page 256](#)

Overdose-Beta Blocker Toxicity

Overdose-Calcium Channel Blockers

Examples of commonly used Calcium Channel Blocker medication:

- Amlodipine (Norvasc)
- Felodipine (Plendil, Renedil)
- Isradipine (DynaCirc)
- Nicardipine (Cardene)
- Nifedipine (Procardia, Adalat)
- Verapamil (Calan)
- Diltiazem (Cardizem)

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

Criteria for cardiovascular toxicity is defined by:
Chest Pain, SBP<90mmHg, **or** Altered Mental Status

AND

HR<60 or 2nd **or** 3rd degree heart blocks.

If the previous symptoms are presenting follow flow chart below

- **Calcium Chloride 10 ml of 10% solution IV/IO over 20 minutes**

Contact Medical Control in regards to the following:

- If no response may repeat **Calcium Chloride 10 ml of 10% solution IV/IO over 20 minutes**
- If no response refer to and begin External Cardiac Pacing Procedure

Overdose-Calcium Channel Blocker Toxicity

Overdose-Cholinergic Poisoning/ Organophosphates

Emergency Medical Responder

- General Approach Protocol-Adult [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- Wear protective clothing including masks, gloves and eye protection
 - Toxicity to ambulance crew may result from inhalation or topical exposure
- Supplemental 100% oxygen
- Decontaminate patient
 - Remove all clothing and contain run-off of toxic chemicals when flushing
- 12 Lead EKG [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- If severe signs of toxicity, (severe respiratory distress, bradycardia, heavy respiratory secretions) do not rely on pupil constriction to diagnose or titrate medications:
 - **Atropine 2 mg** IVP every 5 minutes, titrate dosing by assessing improvement in respiratory effort/bronchial secretions
- For hypotension (systolic BP < 90 mmHg) not improved by fluid boluses, or when fluid resuscitation is contraindicated
 - **Epi Infusion at 2-10 mcg/min** titrated to maintain systolic BP > 90 mmHg
- If any of the following conditions occur, refer to the appropriate protocol:
 - Altered Mental Status Protocol [Page 86](#)
 - Seizure Protocol [Page 108](#)

Overdose-Cholinergic Poisoning & Organophosphates

Overdose-Opiates

Single Agent Medication	Combination Medication	Long Acting
<ul style="list-style-type: none"> • Oxycodone • Hydrocodone • Morphine • Heroin • Dilaudid • Fentanyl • Codiene 	<ul style="list-style-type: none"> • Vicodin • Norcodin • Percocet • Darvocet • Vicoprofen 	<ul style="list-style-type: none"> • Oxycontin • MS Contin • Methadone

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- Symptoms for patients with Opiate toxidrome include:
 - Coma
 - Pin point pupils
 - Respiratory depression
- **Naloxone (Narcan) up to 2 mg total** IN/IM every 3 minutes
 - **Naloxone (Narcan)** can be administered in **2 mg increments** titrated to respiratory drive and level of consciousness
- Repeat every 3 minutes if signs and symptoms continue
- If respiratory depression does not improve, refer to Airway-Adult Protocol [Page 30](#)

A-EMT-Perform/Confirm All Above Interventions

Paramedic-Perform/Confirm All Above Interventions

- Full ALS Assessment and Treatment
- IV Protocol [Page 104](#)
- **Naloxone (Narcan) 2 mg** IV/IO/IN/IM every 3 minutes
 - If IV access has not been established, **Naloxone (Narcan) 2 mg** IM or IN. 1 mg per nare

Overdose-Opiates

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Overdose-Tricyclic & Tetracyclic Antidepressant

Category	Drugs	Overdose Effects
Tricyclic Antidepressants	<ul style="list-style-type: none"> Amitriptyline (Elavil, Endep, Vanatrip, Levate) Clomipramine (Anafranil) Doxepin (Sinequan, Zonalon, Tridapin) Imipramine (Tofranil, Impril) Nortriptyline (Aventyl, Pamelor, Norventyl) Desipramine (Norpramin) Protriptyline (Vivactil) Trimipramine (Surmontil) Amitriptyline+Chlordiazepoxide (Limbitrol) 	<ul style="list-style-type: none"> Hypotension Anti-cholinergic effects (tachycardia, seizures, altered mental status, mydriasis) AV conduction blocks (prolonged QT interval, wide QRS) VT and VF
Other Cyclic Antidepressants	<ul style="list-style-type: none"> Maprotiline (Ludiomil) Amoxapine (Asendin) Bupropion (Wellbutrin) Trazadone (Desyrel, Trazorel) 	<ul style="list-style-type: none"> Similar to Tricyclics Seizures
Selective Serotonin Reuptake Inhibitors (SSRIs)	<ul style="list-style-type: none"> Citalopram (Celexa) Fluoxetine (Prozac) Fluvoxamine (Luvox) Paroxetine (paxil) Sertraline (Zoloft) 	<ul style="list-style-type: none"> Hypertension, tachycardia, agitation, diaphoresis, shivering Malignant Hyperthermia

Emergency Medical Responder

- General Approach Protocol [Page 27](#)

Basic-Perform/Confirm All Above Interventions

- 12 Lead EKG Procedure [Page 225](#)

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
 - 250 mL normal saline fluid bolus

Paramedic-Perform/Confirm All Above Interventions

- If QRS complex >0.10 sec, hypotension or arrhythmias: **Sodium Bi-Carb 1mEq/kg** repeat in 5-10 min
- SBP <90 mmHg despite fluid bolus, **Epi Infusion 2-10 mcg/kg** to maintain SBP >90 mmHg
- If VT ([Page 66](#)), Altered Mental Status ([Page 86](#)) or Seizures ([Page 108](#)) Occur refer to appropriate protocol

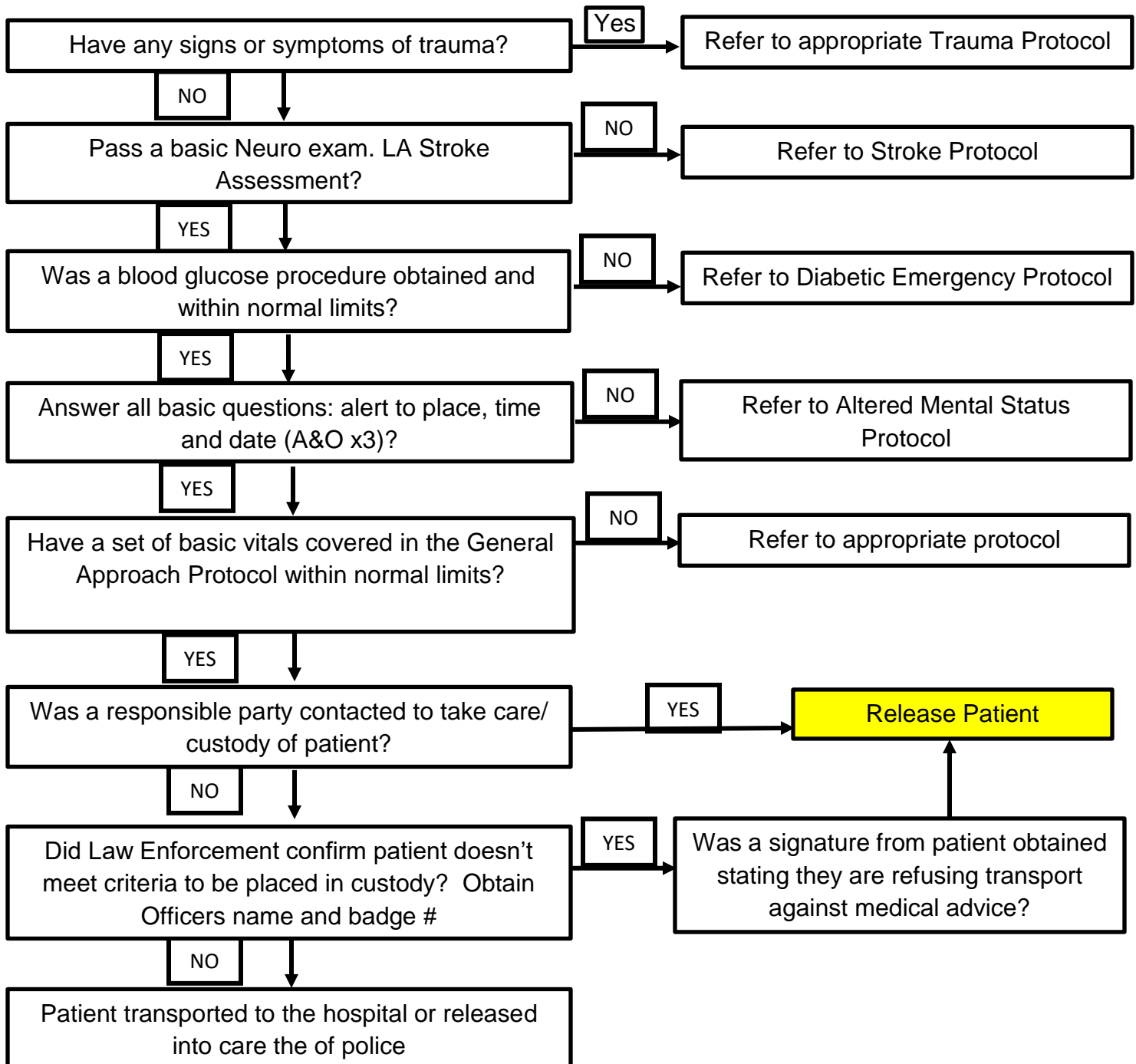
Overdose Tricyclic & Tetracyclic Antidepressant

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Medical Clearing of Impaired Patients

This document is a guideline and a reference tool in regards to covering all aspects of a release of liability from a patient who has admitted and is impaired by alcohol, medication, illegal substances or any other forms of impairment. If impaired patient refuses transport and police custody is not an option, all of the following shall be done and documented prior to patient release.

Did the patient:



Refusal-General

General guidelines for patient refusal of treatment and/or transport:

- A patient is any person who is requesting and/or is in need of medical attention or medical assistance of any kind.
- All patients shall be assessed and offered transport by ambulance to the nearest appropriate emergency department, regardless of the nature of the complaint.
- In the event a patient, or his/her guardian, refuses transport to the hospital, a properly executed refusal process must be completed.

Three-Step Process for EMS personnel when accepting a refusal of care:

Step 1: Determine if the patient is legally recognized as an informed decision maker.

Step 2: Determine if the patient's decision making capacity appears to be intact.

Step 3: Document the interaction well.

Step 1

To undergo the informed refusal of medical care process, the patient should be one of the following:

- A person ≥ 18 years of age
- A court-emancipated minor
- A legally married person of any age
- An unwed pregnant female < 18 years of age only when the medical concern relates to her pregnancy
- A parent (of any age)/ or legal guardian on behalf of their child when the refusal of care does not place the child at risk
- Involve OLMC for any refusal involving a minor when the parent/legal guardian cannot be contacted

Step 2

To undergo the informed refusal of medical care process, the patient or his/her guardian's decision-making process cannot be impaired by medical or psychiatric conditions:

- All of the following must be present:
 - Awake, alert and oriented to person, place, time and situation (**A+OX4**). Patients decision making capacity to be intact.
 - Is not experiencing a medical condition which may interfere with informed decision making capacity (e.g. hypoxia, hypoglycemia, head injury, sepsis etc.)
 - Does not appear clinically intoxicated or under the influence of substances which may impair decision making and judgment
 - Does not express suicidal or homicidal ideations, and does not otherwise pose an obvious threat to themselves or others
 - Is not experiencing hallucination or other apparent thought disorder

Refusal-General

Step 3

The following items should be documented for every refusal:

- A mental status examination as detailed in Step 2 above
- A physical examination (including vital signs)
- Perform blood glucose level and oxygen saturation when appropriate

Pediatric Refusals

- Patient is less than 18 years old
 - Have patient's parent –or–
 - Attempt to have parent or legal guardian respond to scene –or–
 - Obtain release by legal guardian patient must be released to an adult (i.e. other family member, chaperone, or childcare if over 18).
 - If patient is not with an adult try to release patient with law enforcement.
 - If the above options are not available hospital of choice, if known, or closest facility.
- The following scenarios require OLMC contact prior to completing the refusal process:
 - Refusals involving patients less than 1 year old
 - Pediatric refusals where significant vital sign/ or physical exam abnormalities are present
 - In the event a parent or guardian refuses medical care for a minor when there is reasonable concern that this decision poses a threat to the well-being of the minor:
 - Contact the OLMC Physician for input
 - Enlist the aid of law enforcement personnel for patient and crew safety
 - If an immediately life threatening condition exists, transport the patient to the nearest appropriate emergency department.

Refusal of Transport After ALS Initiated:

- Contact OLMC for refusal situations that arise after advanced life support measures have been initiated (example: Narcan (Naloxone administration)
- Insulin-induced hypoglycemia, resolved after glucose administration (see protocol [Page 144](#))

Refusal-After Hypoglycemia Treatment

This protocol applies only to insulin dependent diabetic patients refusing transport after the resolution of insulin-induced hypoglycemia by the administration of intravenous glucose. This protocol cannot be used if the patient takes **any oral diabetes medications**. After treatment of insulin-induced hypoglycemia and return to an asymptomatic state, some patients will refuse transport to the hospital.

The following items should be accounted for and included in the assessment and documentation.

- The patient is on Insulin only (**does not take any oral diabetes medications**)
- The presentation is consistent with hypoglycemia
- Rapid improvement, and complete resolution of symptoms after glucose
- Vital signs within normal limits after glucose given (BP, pulse, respiratory rate, oxygenation and blood sugar > 100 mg/dL)
- There is no indication of an intentional overdose or dosing error
- A meal has been consumed by patient.

Additional patient safety measures that should be considered:

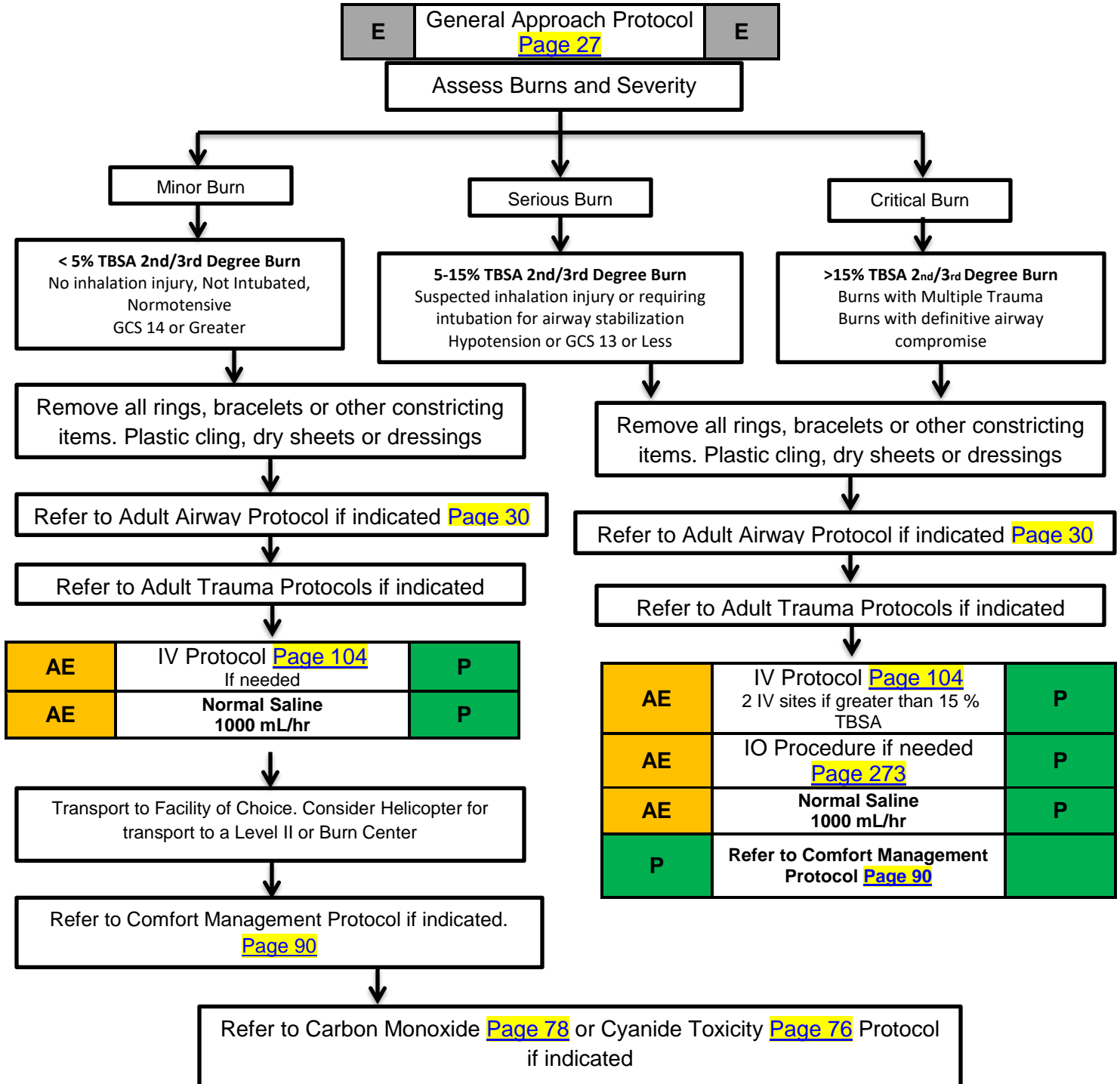
- A family member or caregiver should be available to stay with the patient and assist if a relapse occurs
- Assure the patient understands transport has been offered and subsequently refused
- Inform the patient to follow-up with their physician as soon as possible and/or to re-contact 911 if symptoms reoccur

If the above are accounted for, a properly executed EMS Patient Refusal Form of medical care can be accepted from the patient or custodian without contacting Medical Control.

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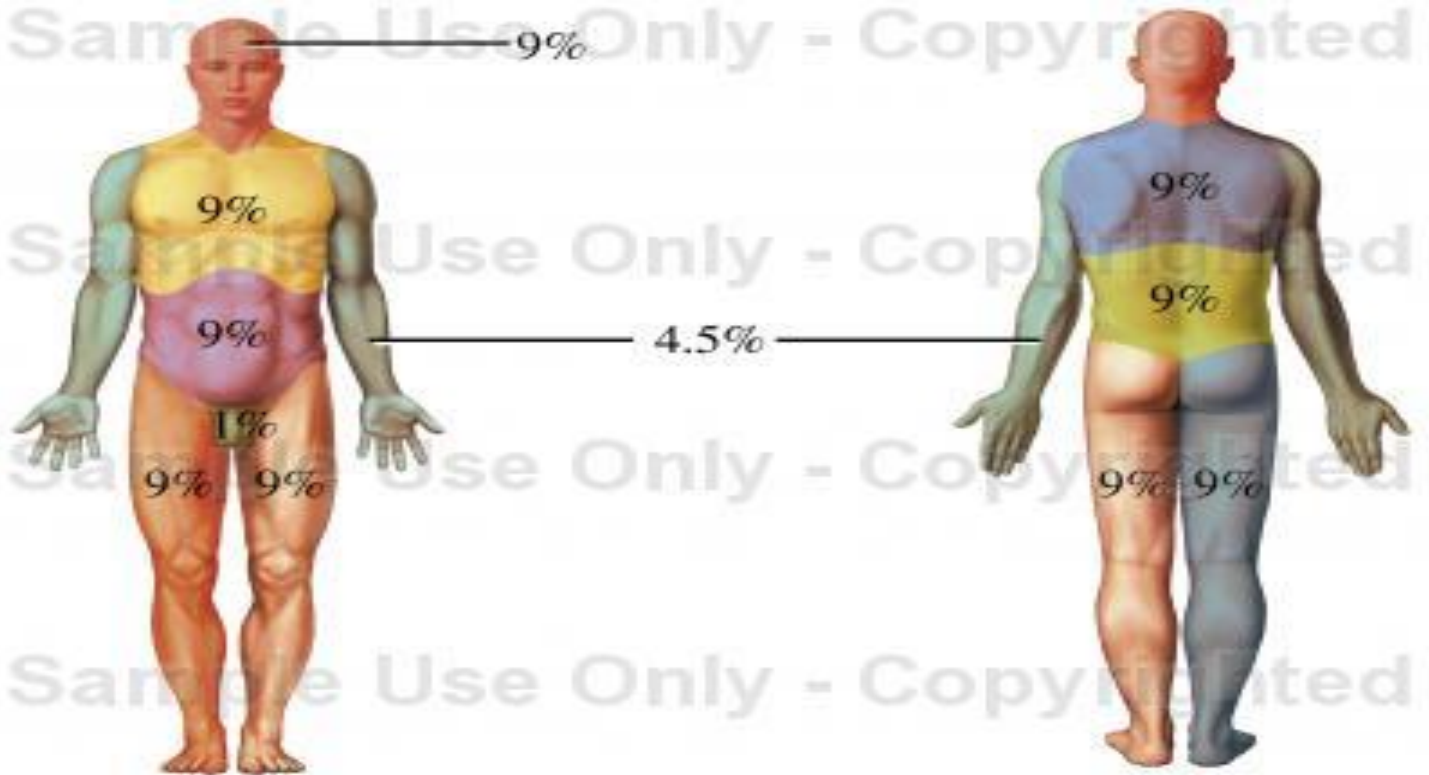
LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Adult Thermal Burn



Trauma-Adult Thermal Burn

Adult Thermal Burns Cont.



•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
- Transport patients to nearest facility if unstable. Consider transport/flight for the nearest level II. Consider flight for transport to burn center.
 - Burn patients are often 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. If the patient requires airway management that cannot be achieved in the field.
 - Signs and symptoms of inhalation injury: carbonaceous sputum, facial burns or edema, hoarseness, singed nasal hairs, agitation, anxiety, cyanosis, stupor or other signs of hypoxia
 - 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.

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

Emergency Medical Responder

- General Approach Protocol [Page 27](#)
- Remove all clothing, contact lenses, and jewelry, especially rings
- Maintain core temperature. Keep patient warm and dry with sheets and blankets. Cover burns with plastic wrap, plastic chucks, or clean, dry dressings.

Basic-Perform/Confirm All Above Interventions

- If inhalation injury is suspected
 - Monitor ETCO2 continuously (if available)
- Estimate Total Body Surface Area (TBSA)
 - Rule of Nines
 - For scattered burns, use the size of patient's hand, including fingers, to equal 1% burn.

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- Place large bore peripheral IV's in unburned skin if possible
- If TBSA % greater than 15% of 2nd and 3rd degree burns, initiate fluid resuscitation with **0.9% Normal Saline at 1,000 ml/hour**, place 2 large bore peripheral IV's
- Refer to IO Procedure if indicated [Page 273](#)
- Observe for signs of impending loss of airway; Refer to the Airway-Adult Protocol as needed:
 - Hypoxia
 - Poor ventilatory effort
 - Altered Mental status/decreased level of consciousness
 - Inability to maintain patent airway
 - Signs or Symptoms of Inhalation injury
 - Carbonaceous sputum
 - Extensive facial burns or facial edema
 - Hoarseness
 - Singed nasal hairs
 - Agitation, anxiety, cyanosis, stupor or other signs of hypoxia

Paramedic-Perform/Confirm All Above Interventions

- **If moderate to severe pain, see Comfort Management Protocol** [Page 90](#)
- Refer to Hazmat-Carbon Monoxide Protocol if indicated [Page 78](#)
- Refer to Hazmat-Cyanide Toxicity Protocol if indicated [Page 76](#)

Trauma-Thermal Burn

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Trauma-Cardiac Arrest

E	General Approach Protocol Page 27	E
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Patient with injuries obviously incompatible with life (decapitation, incineration, obvious destruction to vital organs of head/torso). No resuscitation indicated on patients in Asystole or wide complex PEA < 30 BPM.

YES

Do **NOT** Initiate Transport. Contact Door County Medical Examiner and appropriate Law Enforcement Agency

NO

B	CPR Procedure Page 253	B
B	Spinal Protection Procedure Page 261	B

Initiate TRAUMA ALERT

Perform Interventions during Transport

AE	IV Protocol Page 104	P
AE	1000 mL Bolus of NS	P
P	Known/Suspected Chest Trauma, Bilateral Chest Decompression Procedure Page 250	P

Continue Fluid Bolus

Consider:

- Reduction of Long Bone Fracture
- Reduction of Pelvic Fracture
- Control of External Hemorrhage
- Consider ACLS H's & T's

Return of Pulse?

NO

Continue Expedited Transport

YES

Refer to Post Resuscitation Protocol

MC

Consult Medical Control

MC

Trauma-Cardiac Arrest

Trauma-Cardiac Arrest

History:

Patient who has suffered traumatic injury and is now pulseless

Signs and Symptoms:

- Evidence of penetrating trauma
- Evidence of blunt

Differential:

- Medical condition preceding traumatic event as cause of arrest.
- Tension Pneumothorax
- Hypovolemic Shock
- External hemorrhage
- Unstable pelvic fracture
- Displaced long bone fracture(s)
- Hemothorax
- Intra-abdominal hemorrhage
- Retroperitoneal hemorrhage

Emergency Medical Responder

- General Approach Protocol [Page 27](#)
- CPR can be withheld in Traumatic Cardiopulmonary Arrest under the following circumstances:
Pulseless, apneic, and no other signs of life present **AND**
The presence of one or more of the following:
 - Rigor Mortis
 - Decomposition of body tissues
 - Dependent Lividity
 - Injuries incompatible with life (e.g. incineration, decapitation, hemicorporectomy)
 - Evidence of significant time lapse since pulselessness
 - No resuscitation indicated on patients in Asystole or wide complex PEA<30 BPM

If this becomes the case at hand contact the Door County Medical Examiner and appropriate Law Enforcement Agency via Door County Dispatch Center.

This criteria does not apply in the following scenarios:

- When the Cardiac Arrest is inconsistent with Cardiac Arrest due to trauma
- Lightning or other high voltage injuries
- Drowning
- Suspected hypothermia
- Transport has been initiated
- Perform **CPR Procedure** if indicated [Page 253](#)

Basic-Perform/Confirm All Above Interventions

- Refer to **Spinal Protection Procedure** [Page 261](#)

**IF PATIENT MEETS TRANSPORT CRITERIA INITIATE TRAUMA ALERT
AS SOON AS TIME ALLOWS.**

Trauma Cardiac Arrest

Trauma-Cardiac Arrest

A-EMT-Perform/Confirm All Above Interventions

- Perform all interventions during transport
- IV Protocol [Page 104](#)
- **1000 mL bolus of Normal Saline**

Paramedic-Perform/Confirm All Above Interventions

- Known or suspected chest trauma, Bi-Lateral Chest Decompression Procedure [Page 250](#)
- Expedite transport
- Return of pulse at any time refer to Post Resuscitation Protocol [Page 62](#)

Continue Fluid Bolus

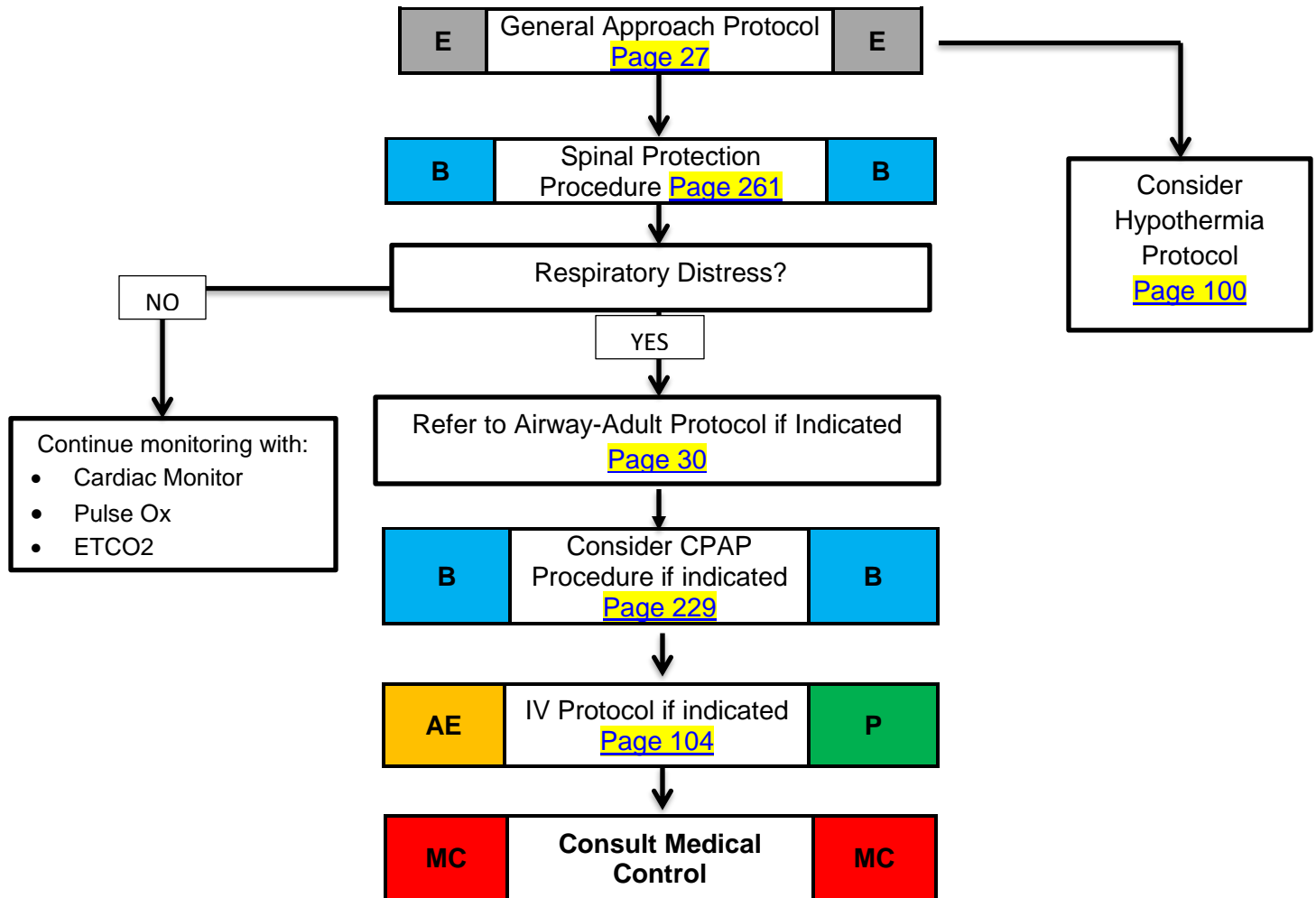
Consider:

- Reduction of Long Bone Fracture
- Reduction of Pelvic Fracture
- Control of External Hemorrhage
- Consider ACLS H's & T's

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Drowning/ Submersion Injury



Drowning/ Submersion Injury

History:

- Submersion in water regardless of depth
- Possible history of trauma ie: diving board
- Duration of immersion
- Temperature of water
- Fresh Water

Signs and Symptoms:

- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing

Differential:

- Trauma
- Pre-existing medical problem
- Pressure injury (diving)
 - Barotrauma
 - Decompression sickness

Emergency Medical Responder

- General Approach Protocol [Page 27](#)
- Consider Hypothermia Protocol [Page 100](#)
- Spinal Immobilization Procedure [Page 261](#)
- If respiratory distress:
 - Refer to Airway Adult Protocol at any time if indicated [Page 30](#)

Basic-Perform/Confirm All Above Interventions

- If respiratory distress:
 - CPAP Procedure if indicated [Page 229](#)
 - Refer to Airway-Adult Protocol if indicated [Page 30](#)
- If no respiratory compromise, continue to monitor with:
 - Cardiac Monitor
 - Pulse Oximetry
 - ETCO2 monitoring

A-EMT-Perform/Confirm All Above Interventions

Paramedic-Perform/Confirm All Above Interventions

- IV Protocol if indicated [Page 104](#)

Trauma-Drowning/Submersion Injury

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Trauma-Extremity

E	General Approach Protocol Page 27	E
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E	Wound Care Procedure. (Control Hemorrhage with Pressure) Page 275	E
E	Tourniquet Procedure if Indicated Page 267	E
E	Splinting Procedure if Indicated Page 264	E



AE	IV Protocol Page 104	P
AE	250 mL NS Bolus to maintain SBP > 90mm/Hg. Max 1L	P



Comfort Management Protocol if Indicated Page 90
--



If amputation: clean amputated part and wrap part in sterile dressing soaked in NS and place in an air tight container, place container on ice if available



MC	Consult Medical Control	MC
----	-------------------------	----

Apply commercially available tourniquet device as proximal on extremity as possible, commercial must be at least 1.5 inches wide, non-commercial must be at least 2 inches wide. Tighten tourniquet until bright red bleeding has stopped. Secure in place and expedite transport to the closest facility. Consider helicopter or direct transport to Aurora Bay Care or St. Vincent. Document time of placement in patient care report and on device (if possible). Notify medical control of tourniquet use.

- Check distal pulses, capillary refill, sensation/movement prior to splinting: If pulse present, splint in position found if possible; If pulse absent, attempt to place the injury into anatomical position.
- Open wounds/fractures should be covered with sterile dressings and immobilized in the presenting position.
- Dislocations should be immobilized to prevent any further movement of the joint.
- Check distal pulses, capillary refill and sensation after splinting
 - Peripheral neurovascular status is important (CMS)
 - In amputations, time is critical. Transport and notify medical control immediately.
 - 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 six hours from the time of injury

Trauma Extremity

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

Differential

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

Apply commercially available tourniquet device as proximal on extremity as possible, commercial must be at least 1.5 inches wide, non-commercial must be at least 2 inches wide. Tighten tourniquet until bright red bleeding has stopped. Secure in place and expedite transport to the closest facility. Consider helicopter or direct transport to Aurora Bay Care or St. Vincent. Document time of placement in patient care report and on device (if possible). Notify medical control of tourniquet use.

- Check distal pulses, capillary refill, sensation/movement prior to splinting: If pulse present, splint in position found if possible; If pulse absent, attempt to place the injury into anatomical position.
- Open wounds/fractures should be covered with sterile dressings and immobilized in the presenting position.
- Dislocations should be immobilized to prevent any further movement of the joint.
- Check distal pulses, capillary refill and sensation after splinting
 - Peripheral neurovascular status is important (CMS)
 - In amputations, time is critical. Transport and notify medical control immediately.
 - 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 six hours from the time of injury

Emergency Medical Responder

- General Approach Protocol [Page 27](#)
- Assess and maintain Scene Safety
- Selective Spinal Immobilization Procedure if indicated [Page 261](#)
- Control bleeding via Wound Care Procedure [Page 275](#)
- If bleeding is still uncontrolled after Wound Care Procedure, refer to Tourniquet Procedure [Page 267](#)
- Do not utilize injured extremity for BP measurement
- Focused assessment of injury:
 - Deformity
 - Swelling, discoloration
 - Distal pulses
 - Gross sensory examination
 - Presence of open wounds over possible fracture sites.
 - Remove restrictive clothing and jewelry if possible.
- Apply manual stabilization, refer to Splinting Procedure [Page 264](#)
- If an amputation, clean amputated part and wrap part in sterile dressing soaked in normal saline and place in air tight container on ice if available.

Trauma Extremity

Trauma Extremity

Basic-Perform/Confirm All Above Interventions

- Treat for shock as necessary

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol
 - **250 mL normal saline bolus** to maintain SBP>90 mmHg, Max 1 Liter

Paramedic-Perform/Confirm All Above Interventions

- Refer to Comfort Management Protocol if indicated. [Page 90](#)

Consult Medical Control if needed

Trauma-Extremity

Left Blank

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Trauma-Head Injury

E	General Approach Protocol Page 27	E
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	Restraint Policy if Indicated Page 19	
B	Spinal Protection Procedure Page 261	B

Obtain and Record GCS and initiate
TRAUMA ALERT if indicated

AE	IV Protocol Page 104	P
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Adult Airway Protocol
[Page 30](#)

Maintain Pulse Ox >92%
ETCO2 target 35-45 mm/Hg

Refer to Seizure Protocol if indicated
[Page 108](#)

Monitor and Reassess

MC	Consult Medical Control	MC
----	-------------------------	----

**DO NOT
HYPERVENTILATE**
Ventilate 8 – 10 Breaths
per minute to maintain
EtCO2 35 – 45 mmHg

Brain Herniation

- Acute unilateral dilated and non-reactive pupil
- Abrupt deterioration in mental status
- Abrupt onset of motor posturing
- Abrupt increase in blood pressure
- Abrupt decrease in heart rate

**Hyperventilate 16-20 breaths per minute
to maintain ETCO2 30-35 mmHg**

EYE INJURY: Consider **Tetracaine 1-2 gtts** prior to irrigation. May repeat in 5-10 minutes up to 4X

Severe Agitation/Combative?

P	Ativan 1-2 mg OR Ketamine 1 mg/kg OR Versed 2-5 mg IV/IO	P
---	---	---

Refer to Airway-RSI Protocol if Indicated
[Page 36](#)

Trauma-Head Injury

Trauma-Head Injury

History:

- Type of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence of 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

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Patient Care Protocol-Adult [Page 27](#)
- Supplemental **Oxygen** to maintain SPO2 >92%
- Restrain Policy as needed [Page 19](#)
- Spinal Protection Procedure [Page 261](#)
- Initiate TRAUMA ALERT if indicated
- Obtain and record GCS
- If Hypertensive elevate cot 15° to 30°

A-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- Observe for signs of impending respiratory failure; Refer to the Airway-Adult Protocol if needed:
 - Hypoxia
 - Poor ventilatory effort
 - Altered mental status/decreased level of consciousness
 - Inability to maintain patent airway

For patients with assisted ventilation

- Titrate to target an ETCO2 of 35 to 45 mmHg
- Acute herniation should be suspected when the following signs are present:
 - Acute unilateral dilated and non-reactive pupil
 - Abrupt deterioration in mental status
 - Abrupt onset of motor posturing
 - Abrupt increase in blood pressure
 - Abrupt decrease in heart rate

Trauma-Head Injury

Trauma-Head Injury

- Hyperventilation (ventilatory rate of 20) is a temporizing measure which is only indicated in the event of acute herniation
- If signs of herniation develop, increase ventilatory rate to 20/minute and target an ETCO₂ of 30-35 mmHg

Paramedic-Perform/Confirm All Above Interventions

- If severely agitated/combative and unable to de-escalate by any other means consider:
 - **Ativan 1-2 mg IV/IO OR**
 - **Ketamine 1 mg/kg IV/IO OR**
 - **Midazolam (Versed) 2-5 mg IV/IO**
- Refer to RSI Protocol if indicated [Page 36](#)

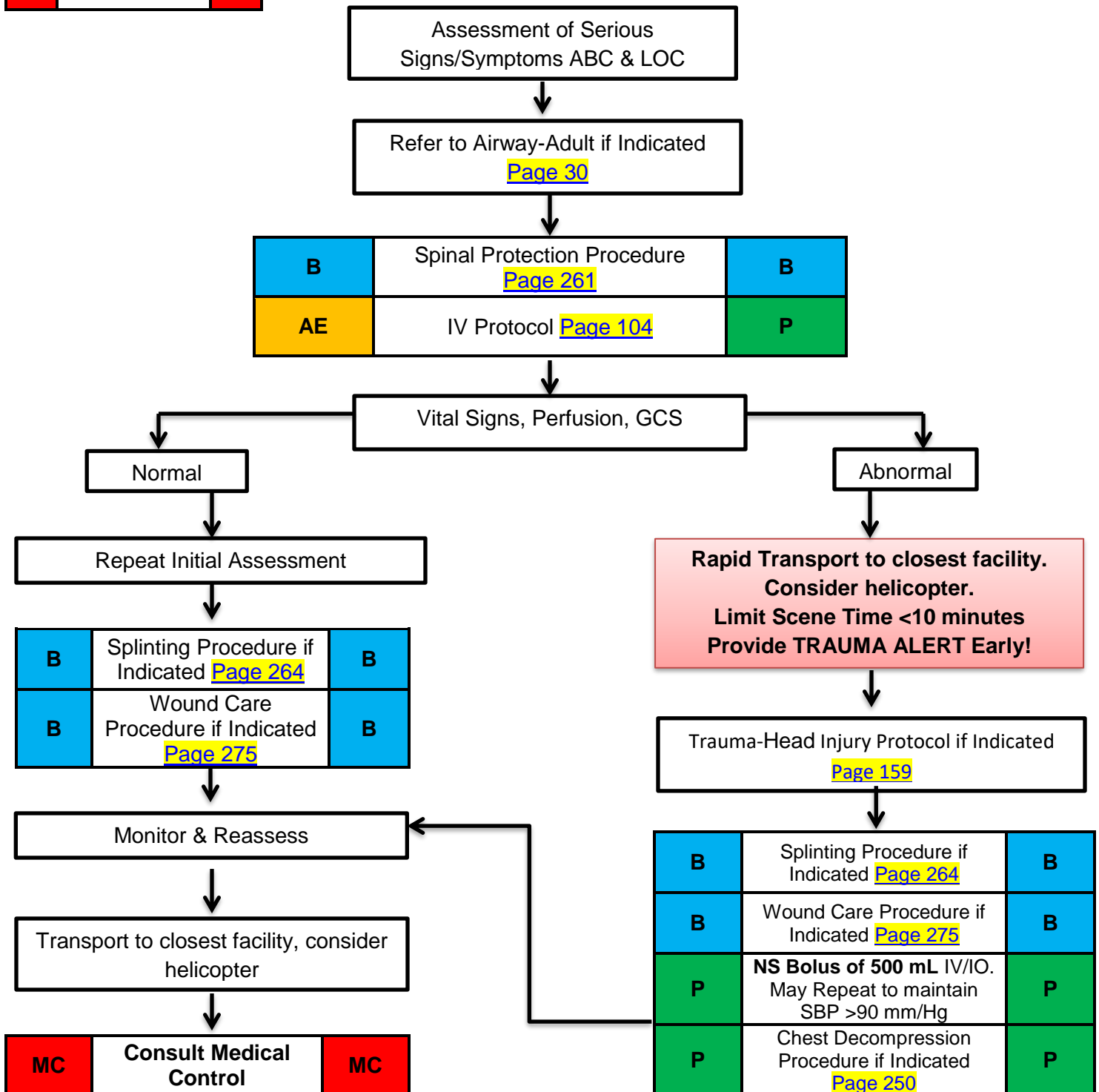
EYE INJURY

- Consider **Tetracaine 1-2 gtts** per eye prior to irrigation. May repeat in 5-10 minutes up to 4 times.

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Trauma-Multiple Trauma



Trauma-Multiple Trauma

Trauma-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

Assess all patients for major trauma criteria. Major trauma patients should have transport initiated within 10 minutes of arrival on scene whenever possible. In the setting of major trauma, DO NOT prolong scene time to perform procedures unless immediately necessary to stabilize patient (e.g. hemorrhage control). Initiate all other procedures en-route to the trauma center.

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- General Approach Protocol [Page 27](#)
- Refer to Airway-Adult Protocol if indicated [Page 30](#)
- Selective Spinal Immobilization Procedure if indicated [Page 261](#)
- Supplemental oxygen if any respiratory symptoms to maintain SPO2 >92%
- Examine patient for obvious bleeding
- Control active bleeding with direct pressure, Wound Care Procedure if indicated [Page 275](#)
- Assess disability-neurologic status/record Glasgow coma score
- Head to toe examination to assess for injuries
- Restraint Policy if indicated [Page 19](#)
- Trauma Head Injury Protocol if indicated [Page 159](#)

Trauma-Multiple Trauma

Trauma-Multiple Trauma

A-EMT-Perform/Confirm All Above Interventions

- IV Procedure [Page 104](#)
 - If SBP < 90 mmHg, administer boluses of **0.9%NaCl at 250 ml** until SBP > 90 mmHg

Paramedic-Perform/Confirm All Above Interventions

- Assess for Tension Pneumothorax
- Tension Pneumothorax Procedure should be suspected in patients who exhibit:
 - Severe respiratory distress with hypoxia
 - Unilateral decreased or absent lung sounds (may see tracheal deviation away from collapsed lung field)
 - Evidence of hemodynamic compromise (e.g. shock, hypotension, tachycardia, altered mental status)
- Refer to Pneumothorax Procedure if indicated [Page 250](#)

Pediatric Protocols

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Normal Vital Signs for Age of Pediatric Patients				
Age	Weight (kg)	Heart Rate	Respiratory Rate	Systolic Blood Pressure
Premature (>37wks)	0.7 - 2.5	120-180	50-70	40-60
Newborn (27-42wks)	2.5 - 4.3	100-170	40-60	50-70
Neonate (1-28days)	3.4 - 5	110-160	30-50	60-80
1-5 months	4.5 - 10	110-160	25-40	70-100
6-11months	7 - 10	90-140	25-35	80-100
1 year	10	90-130	20-30	80-100
2-3 years	12 - 14	90-120	20-30	80-100
4-5 years	16 - 18	80-120	15-25	80-110
6-9 years	20 - 26	70-110	12-20	80-120
10-12 years	32 - 42	70-90	12-20	90-140
13 + years	>40	60-90	12-18	90-140

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric General Approach

Child shall be defined as the following:

- Age <12 years of age or weight <40 kg (if age unknown)
- No signs of puberty if age/weight not able to be determined

Scene Safety

Bring all necessary equipment to patient's side
Demonstrate professionalism and courtesy

Be sure proper PPE is donned
(Contact, droplet, airborne)

Initial Assessment
BLS Maneuvers
Consider Spinal Protection
Procedure [Page 261](#)

Vital Signs

BP as appropriate pulse, resp. rate at least every 15 minutes
Temperature if pt. with hx fever or hot to touch,
Monitor ECG, pulse ox, blood glucose, GCS, capillary refill

Pediatric-Airway Protocol if indicated
[Page 172](#)

Consider Supplemental O2 to
maintain SPO2 ≥92%

Consider 12 Lead EKG and/or
Cardiac Monitor

ETCO2 Procedure as
Appropriate [Page 228](#)

IV Protocol if indicated [Page 104](#)

Appearance

Work of Breathing

**Pediatric
Triangle**

Circulation

Age Group	Respiratory Rate	Heart Rate	Systolic BP
Newborn	30-60	120-180	>60
Infant (1-12 months)	20-40	100-140	>70
Toddler (1-3 years)	20-34	90-130	>75
Preschooler (3-5 years)	20-30	80-120	>80
School Age (6-12 years)	18-30	70-110	>80
Adolescent (13 + years)	12-20	60-100	>90

Pediatric-Cardiac Arrest
Protocol [Page 178](#)

If Pediatric has absent pulses,
initiate compressions

Unless specified in protocol, all medication dosages and equipment sizes should be calculated using the Broselow-Luten or Houston-Haines system

Pediatric-General Approach

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric General Approach

The following measures will apply to the management of all pediatric patients:

A Child shall be defined as:

- Age <12 years of age or weight <40 kg (if age unknown)
- No signs of puberty if age/weight not able to be determined

Age Group	Respiratory Rate	Heart Rate	Systolic BP
Newborn	30-60	120-180	>60
Infant (1-12 months)	20-40	100-140	>70
Toddler (1-3 years)	20-34	90-130	>75
Preschooler (3-5 years)	20-30	80-120	>80
School Age (6-12 years)	18-30	70-110	>80
Adolescent (13 + years)	12-20	60-100	>90

Emergency Medical Responder

- Ensure scene safety
- Scene survey to determine environmental conditions, mechanism of injury or illness and potential for hazardous conditions
- Form general impression of patient's condition
- Establish patient responsiveness
- Immobilize spine if cervical or other spine injury suspected
- Assess airway and breathing, manage as appropriate
- Supplemental 100% Oxygen if any respiratory signs or symptoms and to maintain $\geq 92\%$
- Assess circulation and perfusion by measuring heart rate, and observing skin color, temperature, capillary refill and the quality of central/peripheral pulses.
 - For children with absent pulses, initiate cardiopulmonary resuscitation
- Control hemorrhage using direct pressure or a pressure dressing
- Measure Blood Pressure in children as appropriate
- Evaluate mental status including pupil reaction, motor function and sensation
- For mental status, use the AVPU scale:
 - A- The patient is alert and oriented (age appropriate)
 - V – The patient is responsive to verbal stimulus
 - P – The patient is responsive to painful stimulus
 - U – The patient is unresponsive to any stimulus
- Expose the child only as necessary to perform further assessments
- Maintain the child's body temperature throughout assessment
- Utilize the Broslow-Luten® or Houston-Haines system for estimating patient weight

Basic-Perform/Confirm All Above Interventions

- Airway/ventilatory management as needed
- Perform cardiac monitoring
- Record and monitor O2 saturation to maintain $\geq 92\%$ Procedure [Page 260](#)
- Record and monitor End-tidal CO2 if applicable Procedure [Page 228](#)

Pediatric-General Approach

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric General Approach Cont.

A-EMT- Perform/Confirm All Above Interventions

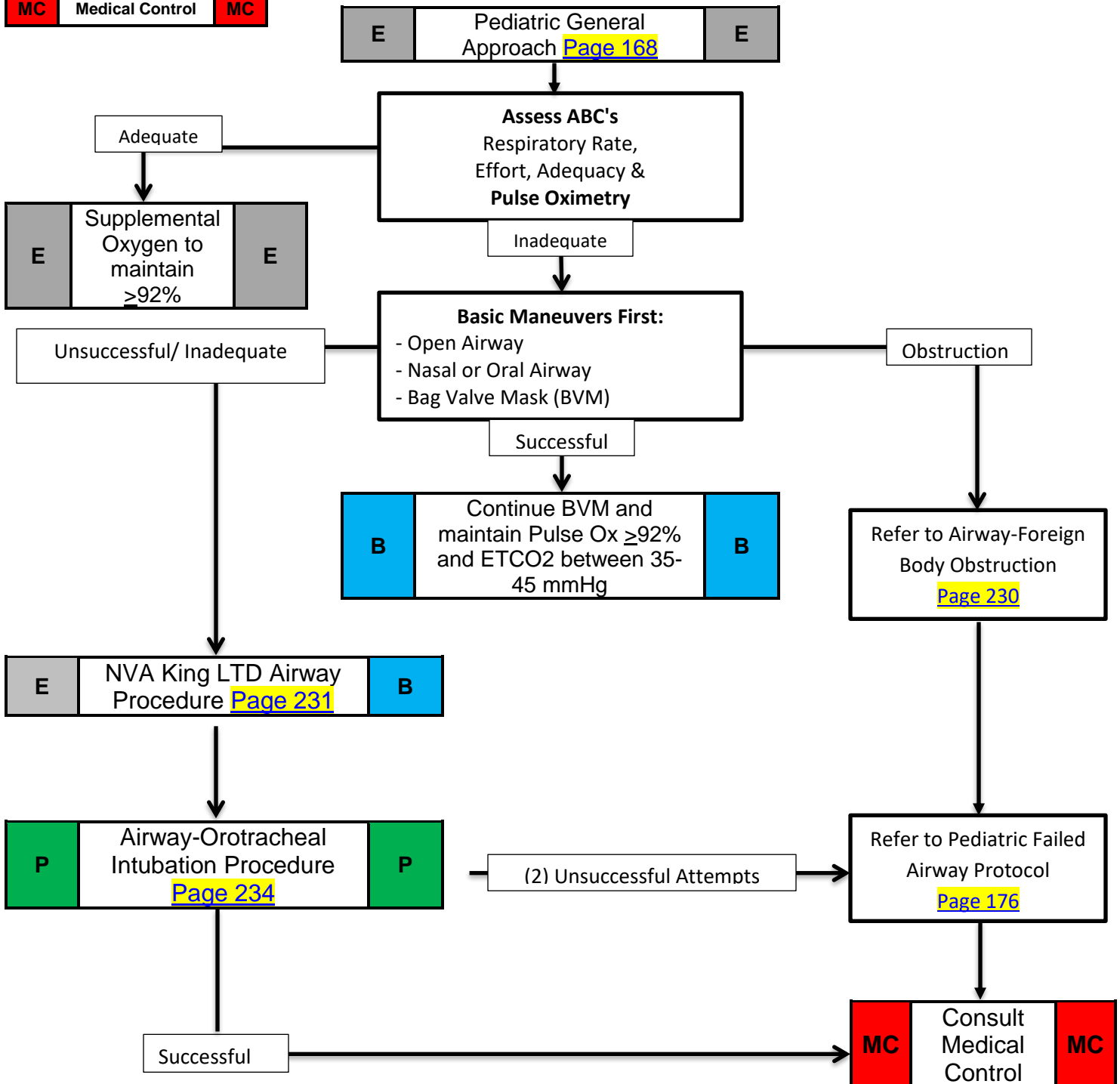
Paramedic- Perform/Confirm All Above Interventions

- Consider IV/IO Protocol if indicated [Page 104](#)
- Unless specified in protocol, all medication dosages and equipment sizes should be calculated using the Broselow-Luten or Houston-Haines system
- Reassess the patient frequently

Equipment	Infant (4-8kg)	Small Child (8-10kg)	Small Child (10-12)	Child (12-14kg)	Child (14-18kg)	Child (18/24kg)
BP Cuff	Newborn- Infant	Infant/Child	Infant/Child	Child	Child	Child
IV Catheter	22-24	22-24	20-24	18-20	18-20	18-20
Intraosseous	18g	18g	18-15g	15g	15g	15g
Oral Airway	40	40-50	50-60	50-60	60-70	70-80
BVM	Infant	Infant	Child	Child	Child	Child
O2 Mask	Newborn	Newborn	Pediatric	Pediatric	Pediatric	Pediatric
Laryngoscope Blade (size/type)	Straight (0-1)	Straight (1)	Straight (1)	Straight or Curved (1-2)	Straight or Curved (2)	Straight or curved (2)
ET TUBE all uncuffed	Preterm (2.5) Term (3.0 or 3.5)	3.5-4.0	4.0-4.5	4.5	5.0	5.5
ETT Stylet	6F	6F	6F	6F	6F	14F
ETT length (cm @ the lip)	9-10.5	11-12	12.5-12.5	12.5-13.5	14-15	15.5-16.5
ET Suction Catheter	6F	8F	8F	8F	10F	10F
Defib. Pads	Pediatric until 1yr of 10kg	Pediatric or Adult When >1yr or >10kg	Pediatric or Adult When >1yr or >10kg	Adult	Adult	Adult

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Airway



Pediatric-Airway

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Airway

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

A-EMT-Perform/Confirm All Above Interventions

- General Pediatric Approach Protocol [Page 168](#)
- If suspicion of trauma, maintain spinal protection
- Suction all debris, secretions from airway
- Bag valve mask ventilate as needed
- Ventilate at a rate of 20 breaths/minute for all ages
- Supplemental 100% O2 to maintain $\geq 92\%$
- Monitor end-tidal CO2 and oxygen saturation continuously

Paramedic- Perform/Confirm All Above Interventions

- Address cardiac rhythm abnormalities per appropriate protocol
- Monitor end-tidal CO2 and oxygen saturation continuously
- Following placement of ETT or NVA confirm proper placement
 - Assess epigastric sounds, breath sounds and chest rise and fall
 - Observe for presence of alveolar waveform on capnography
 - Record tube depth and secure in place using a commercial tube holder
 - Utilize head restraint device (i.e. "head blocks") or rigid cervical collar and long spine board as needed to help secure airway in place
 - Digital capnography (waveform) is the system standard for ETCO2 monitoring.
 - Continuous ETCO2 monitoring is a MANDATORY component of invasive airway management.

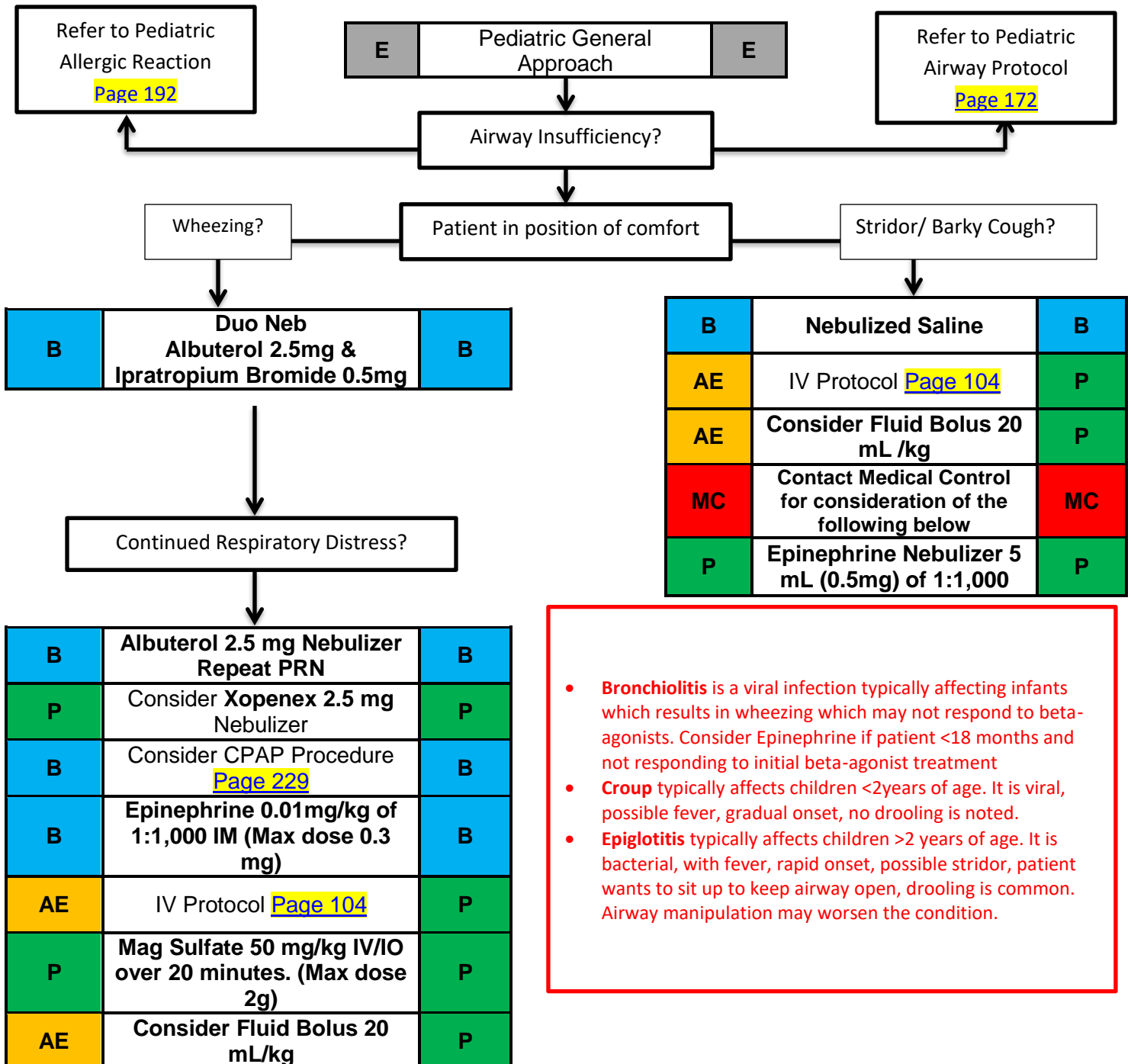
Foreign Body Airway Obstruction

- Immediate transport is indicated
- If unresponsive open airway using a head tilt/chin lift (if no trauma)
- If < 1 year old, administer up to 5 back blows and 5 chest thrusts (Heimlich Manuver)
- If 1 to 8 years, administer compressions and attempts at ventilation until the foreign body is dislodged
- If ventilation is unsuccessful (O2 saturations cannot be kept $\geq 92\%$) perform in the following order:
- Reposition airway and attempt bag valve mask assisted ventilation again
- If unsuccessful, establish direct view of object with laryngoscope and attempt to remove it with Magill forceps
- If unsuccessful, re-attempt BVM ventilation; If oxygen saturation $\geq 92\%$ with BVM proceed no further and expedite transport
- If patient cannot be ventilated/oxygenated with the above measures,
- ***Paramedics- simultaneously contact medical control and perform needle cricothyrotomy*** [Page 233](#)
- Expedite transport to nearest emergency department

Pediatric-Airway

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Airway, Dyspnea



- **Bronchiolitis** is a viral infection typically affecting infants which results in wheezing which may not respond to beta-agonists. Consider Epinephrine if patient <18 months and not responding to initial beta-agonist treatment
- **Croup** typically affects children <2years 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.

Pediatric-Dyspnea

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Airway, Dyspnea

History:

- Time of onset
- FBAO
- Fever or infection
- Sick contacts
- Asthma
- Treatment (oxygen, nebulizer)
- Medications steroids, inhalers
- Toxic exposure
- Trauma

Signs and Symptoms

- Wheezing or stridor
- Respiratory retractions
- Increased heart rate
- Altered level of consciousness
- Anxious appearance

Differential (Life Threatening)

- Allergic reaction
- Asthma
- Aspiration
- Foreign body
- Infection
- Pneumonia, croup, epiglottitis
- Congenital heart disease
- Medication or toxin
- Trauma

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)
- Determine if airway is insufficient, if yes:
 - Refer to Pediatric-Allergic Reaction Protocol [Page 192](#)
 - Refer to Pediatric-Airway Protocol [Page 172](#)
- Place patient in position of comfort

Basic-Perform/Confirm All Above Interventions

- Assess lung sounds.
- Wheezing noted:
 - **Duo Neb Albuterol 2.5mg & Atrovent 0.5mg**
- Continued Respiratory Distress and >2 yrs of age:
 - **Albuterol 2.5mg**. May repeat PRN.
- Consider CPAP Procedure
- Continued Respiratory Distress and >2 yrs of age:
 - **0.01mg/kg Epi IM of 1:1,000** (Max 0.3mg)
- If patient <2 yrs of age or stridor noted upon lung assessment
 - Nebulized **Normal Saline**

A-EMT- Perform/Confirm All Above Interventions

Paramedic- Perform/Confirm All Above Interventions

- Wheezing noted and >2 yrs. of age:
 - IV Protocol [Page 104](#)
 - ****PARAMEDIC 50mg Magnesium Sulfate IV/IO over 20 minutes (Max dose 2 g) PARAMEDIC****
 - ****PARAMEDIC Consider Xopenex 2.5 mg****
 - Consider **NS bolus 20 mL/kg**
- Stridor, barky croupy cough noted or patient is <2 yrs. of age and is continuing to have respiratory distress after one Albuterol treatment:
 - IV Protocol [Page 104](#)
 - Consider **Fluid Bolus 20 mL /kg**

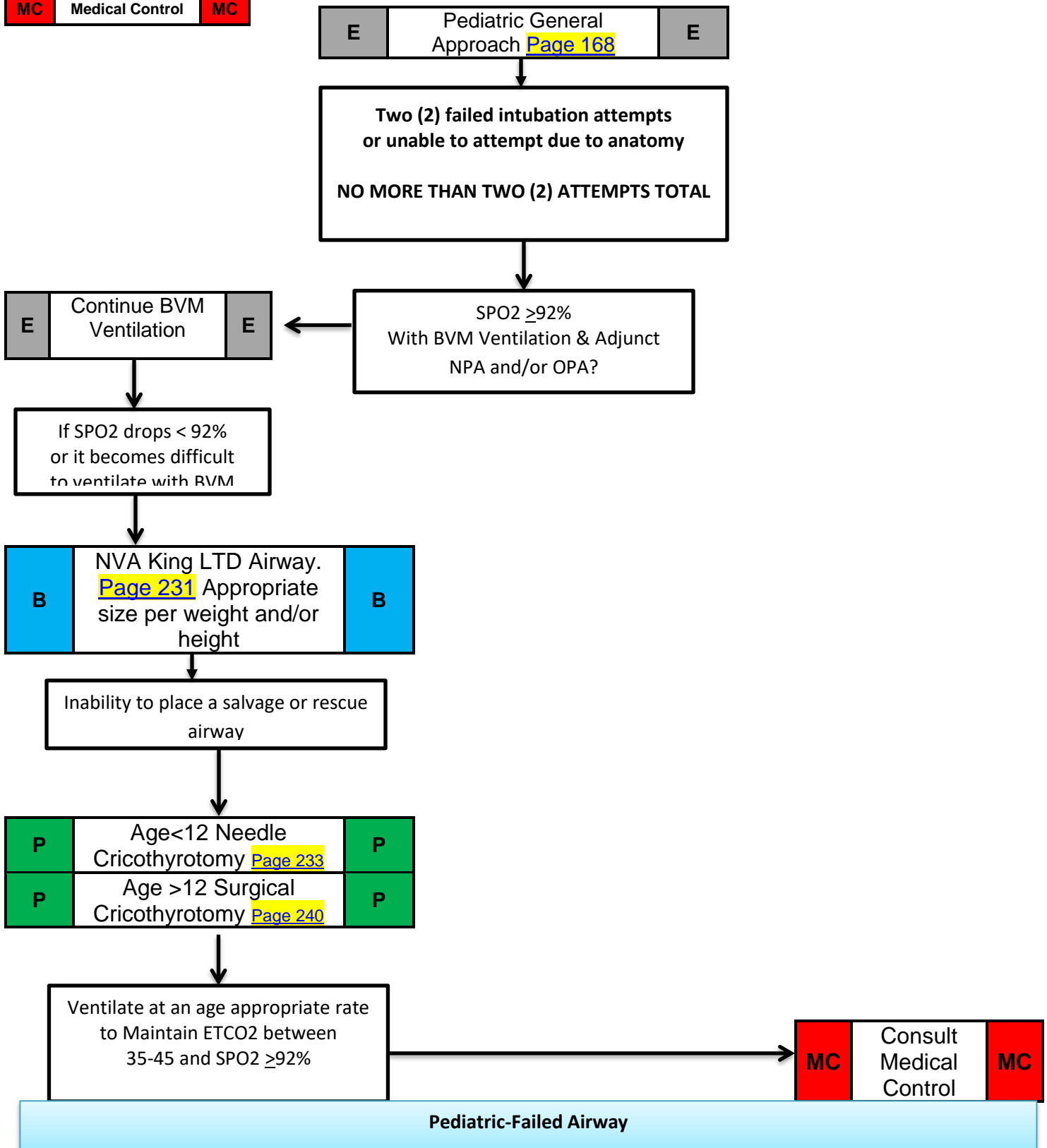
Contact Medical Control for Consideration of the following:

- **Epinephrine Nebulizer 5 mL (0.5 mg) of 1:1,000 solution**

Pediatric-Dyspnea

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Airway, Failed



LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Airway, Failed

Emergency Medical Responder

- Pediatric General approach Protocol [Page 168](#)
- Maintain SPO2 $\geq 92\%$ with BVM Ventilations with adjunct airway of Nasopharyngeal Airway or Oropharyngeal Airway
- Continue Bag Valve Mask Ventilations

Basic-Perform/Confirm All Above Interventions

A-EMT-Perform/Confirm All Above Interventions

- If SPO2 drops $< 92\%$ or it becomes difficult to ventilate with BVM and/or facial trauma/ swelling prevents the use of adjunct airway NPA or OPA
 - NVA King LTD Airway. Appropriate size per weight and/or height [Page 231](#)

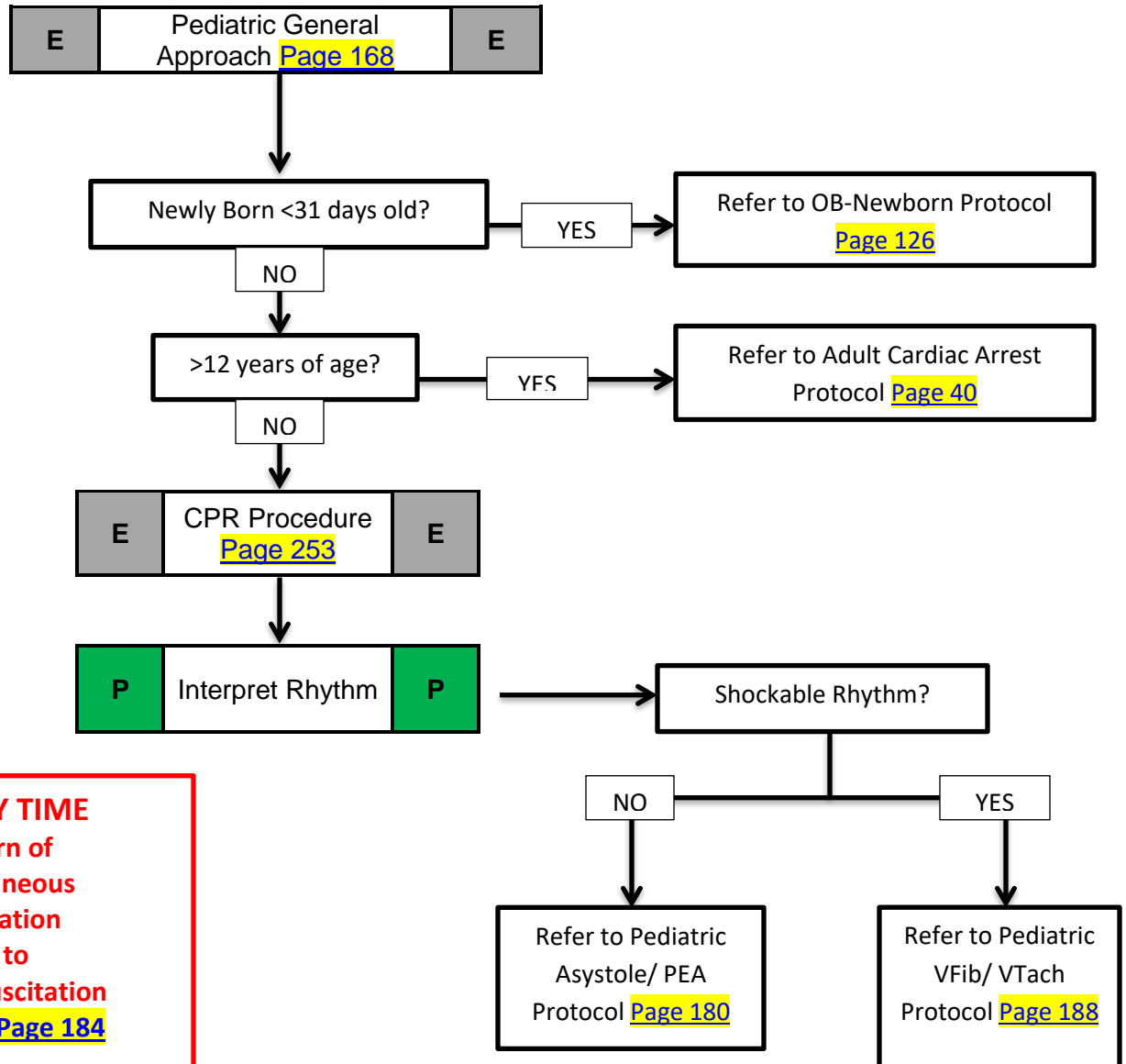
Paramedic- Perform/Confirm All Above Interventions

- Two (2) failed intubation attempts or are unable to intubate due to anatomy
NO MORE THAN TWO (2) ATTEMPTS TOTAL
- If Basic Procedure of NVA fails or is unsuccessful:
 - < 12 yrs of age, Needle Cricothyrotomy [Page 233](#)
 - > 12 yrs of age, Surgical Cricothyrotomy [Page 240](#)
- Ventilate at an age appropriate rate to maintain ETCO2 between 35-45 mmHg and SPO2 $\geq 92\%$

Pediatric-Failed Airway

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Cardiac Arrest



Pediatric-Cardiac Arrest

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Cardiac 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, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, Potassium)
- Acidosis

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

A-EMT-Perform/Confirm All Above Interventions

- Pediatric General Approach Protocol [Page 168](#)
- If under 31 days old, refer to OB Newborn Protocol [Page 126](#)
- If over 12 yrs of age, refer to Adult Cardiac Arrest Protocol [Page 40](#)
- Determine patient is apneic and pulseless and perform [CPR Procedure Page 253](#)

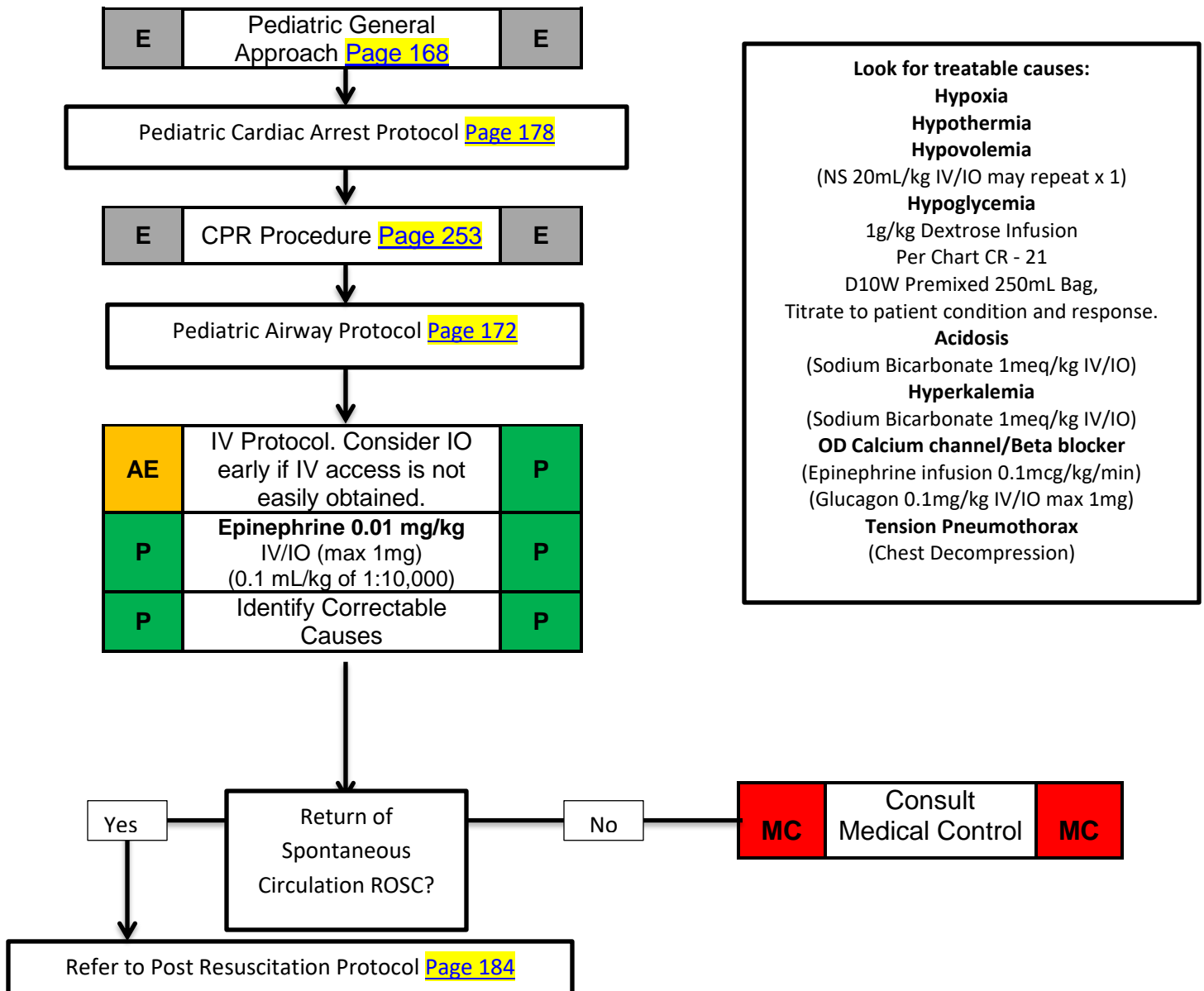
Paramedic- Perform/Confirm All Above Interventions

- Interpret Rhythm
- If rhythm is shockable, refer to Pediatric VFib/ VTach Protocol [Page 188](#)
- If rhythm is non-shockable, refer to Asystole / PEA Protocol [Page 180](#)

Pediatric-Cardiac Arrest

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Asystole/PEA



Pediatric-Asystole/ PEA

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Pediatric-Asystole/PEA

History:

- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Foreign Body Airway Obstruction

Signs & Symptoms:

- Unresponsive
- Cardiac Arrest
- Signs of lividity or rigor

Differential:

- Respiratory failure
- Foreign body
- Hyperkalemia
- Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General Approach Protocol [Page 168](#)
- Pediatric Cardiac Arrest Protocol [Page 178](#)
- CPR Procedure [Page 253](#)
- Pediatric Airway Protocol [Page 172](#)

Basic-Perform/Confirm All Above Interventions

- IV Protocol. Consider IO early if IV access is not easily obtained.

Paramedic- Perform/Confirm All Above Interventions

- **Epinephrine 0.01mg/kg (Max 1mg) (0.1mL/kg of 1:10,000)**
- Repeat Epinephrine every 3 to 5 minutes same dose
- Flush medication with **10-20 mL of NS** after each administration
- Identify correctible causes listed to the right:
- If pre-hospital ROSC (Return of Spontaneous Circulation) Is noted, refer to Post Resuscitation Protocol [Page 184](#)

Look for treatable causes:

Hypoxia

Hypothermia

Hypovolemia

(NS 20mL/kg IV/IO may repeat x 1)

Hypoglycemia

1g/kg Dextrose Infusion

Per Chart CR - 21

D10W Premixed 250mL Bag,

Titrate to patient condition and response.

Acidosis

(Sodium Bicarbonate 1meq/kg IV/IO)

Hyperkalemia

(Sodium Bicarbonate 1meq/kg IV/IO)

OD Calcium channel/Beta blocker

(Epinephrine infusion 0.1mcg/kg/min)

(Glucagon 0.1mg/kg IV/IO max 1mg)

Tension Pneumothorax

(Chest Decompression)

Pediatric-Asystole/ PEA

Pediatric-Bradycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

E	Pediatric General Approach Page 168	E
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Pediatric Airway Protocol Page 172
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Poor perfusion, Decreased blood pressure, Respiratory insufficiency

NO

Monitor and reassess

MC	Consult Medical Control	MC
----	-------------------------	----

YES

E	HR <60 and poor perfusion despite airway intervention begin CPR Procedure	E
AE	IV Protocol. NS bolus, 20 mL/kg (May repeat 1 x)	P
P	Epinephrine 0.01 mg/kg IV/IO q 3-5 min (0.1 mL/kg of 1:10,000) Epinephrine infusion 0.1-1 mcg/kg/min	P
P	Atropine 0.02 mg/kg IV/IO (Min 0.1 mg / Max 1mg) May repeat x 1 in 5 min	P
P	Consider External Pacing Procedure Page 257	P
P	For pacing: Midazolam 0.1 mg/kg IV/IO/IM/IN May repeat in 3-5 minutes as needed to max 5mg , and / or Fentanyl 1 mcg/kg IV / IO bolus (max initial dose 100 mcg) May repeat 0.5 mcg/kg every 5 minutes as needed Max total dose 150 mcg	P

Pediatric-Bradycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Bradycardia

History:

- Past Medical History
- Medications
- Events Leading to Current Status

Signs & Symptoms:

- HR <60/min with hypotension, acute altered LOC, chest pain, CHF, Sz, syncope or shock secondary to bradycardia
- Altered LOC
- Shock/Hypotension
- Syncope

Differential:

- Respiratory effort
- Respiratory obstruction
- Foreign body
- Secretions
- Croup
- Epiglottitis
- Hypovolemia
- Hypothermia
- Hypoxia
- Infection / Sepsis
- Medication or Toxin
- Hypoglycemia
- Trauma

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General approach Protocol [Page 168](#)
- Refer to Pediatric-Airway Protocol [Page 172](#)
- If patient has poor perfusion, decreased blood pressure, respiratory insufficiency, HR <60 and poor perfusion despite airway intervention begin CPR Procedure [Page 253](#)

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

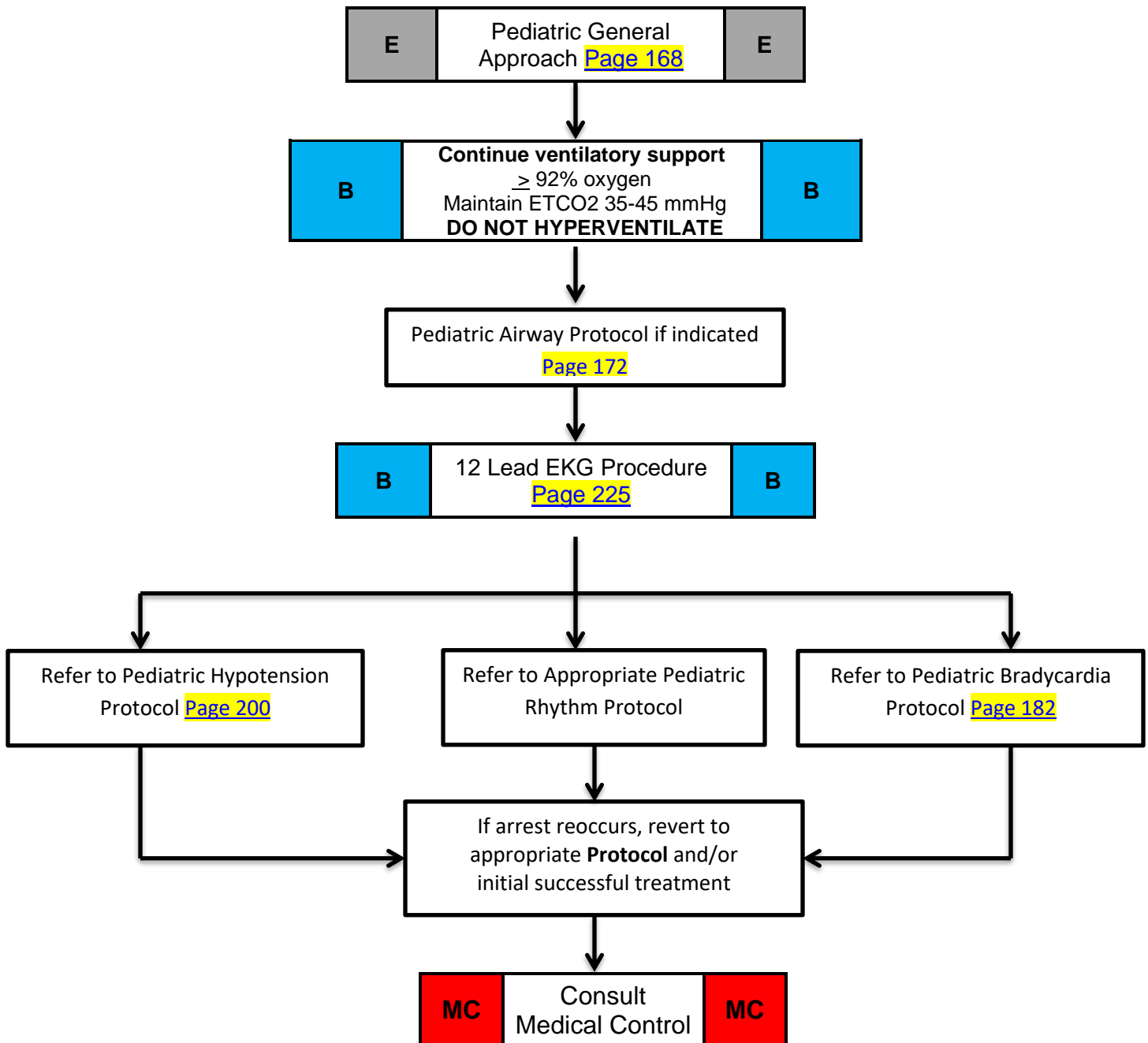
Paramedic- Perform/Confirm All Above Interventions

- **Epinephrine 0.01 mg/kg IV/IO q 3-5 min (0.1 mL/kg of 1:10,000) mg/kg**
- **Epinephrine infusion 0.1-1 mcg/kg/min**
- Atropine 0.02 mg/kg IV/IO (Min 0.1 mg / Max 1mg)
 - May repeat x 1 in 5 min
- Consider External Pacing Procedure
- **For pacing: Midazolam 0.1 mg/kg IV/IO/IM/IN** May repeat in 3-5 minutes as needed to **max 5mg**, and / or
- **Fentanyl 1 mcg/kg IV / IO bolus (max initial dose 75 mcg)** May repeat 0.5 mcg/kg every 5 minutes as needed **Max total dose 150 mcg**

Pediatric-Bradycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Post Resuscitation



Pediatric-Post Resuscitation

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Post Resuscitation

History

- Respiratory Arrest
- Cardiac Arrest

Signs & Symptoms

- Return of pulse

Differential

- Continue to address specific differentials associated with original dysrhythmia

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)
- Refer to Pediatric-Airway Protocol if indicated [Page 172](#)
- Refer to Pediatric Hypotension Protocol [Page 200](#)
- Refer to Appropriate Pediatric Rhythm Protocol
- Refer to Pediatric Bradycardia Protocol [Page 182](#)
- If arrest reoccurs, revert to appropriate Protocol and/or initial successful treatment

Basic-Perform/Confirm All Above Interventions

A-EMT-Perform/Confirm All Above Interventions

Paramedic- Perform/Confirm All Above Interventions

- **Continue ventilatory support**
- Maintain $\geq 92\%$ oxygen
- Maintain ETCO₂ at 35-45 mmHg
- Age appropriate Respiratory Rate
- **DO NOT HYPERVENTILATE**
- 12 Lead EKG Procedure [Page 225](#)

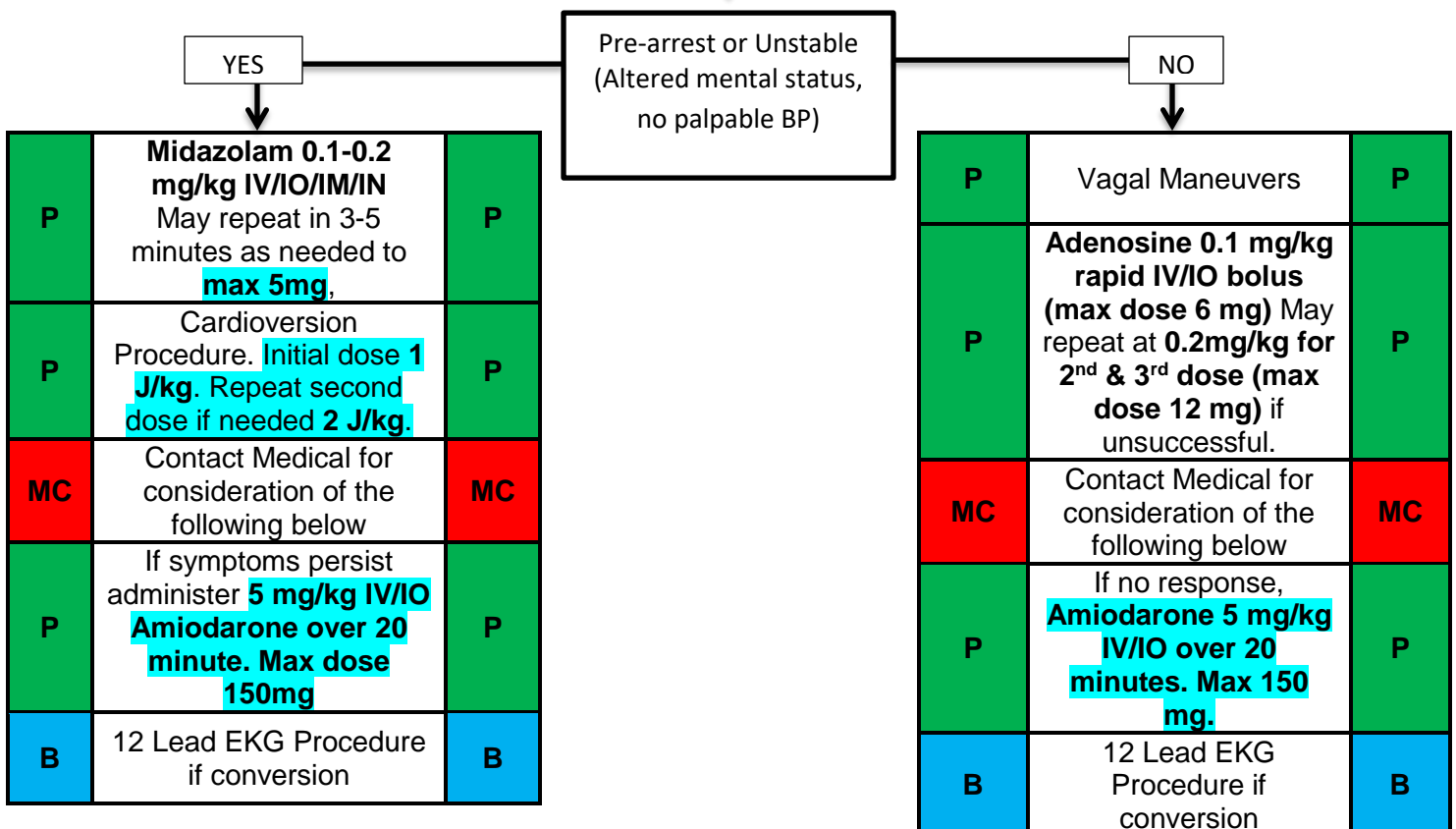
Pediatric-Post Resuscitation

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Supraventricular Tachycardia

E	Pediatric General Approach Page 168	E
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B	12 Lead EKG Procedure Page 225	B
AE	IV Protocol Page 104	P



Pediatric-Supraventricular Tachycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Supraventricular Tachycardia

History:

- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Toxic ingestions
- History of palpitations / heart racing
- Syncope / 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 (WPW, Valvular)
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever / Infection / Sepsis
- Hypothermia / Hyperthermia
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see Hx)
- Pulmonary embolus
- Trauma / Tension Pneumothorax

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)
- Supplemental O2 via NRB or Blow By as patient allows

Basic-Perform/Confirm All Above Interventions

- Perform 12 Lead EKG Procedure [Page 225](#)

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

Note: Infants with heart rates < 220 and children with heart rates < 180 typically will respond when the precipitating cause is treated (e.g. fever, dehydration)

- If patient is Pre-arrest or Unstable (Altered mental status, no palpable BP) perform the following:
 - If time permits, **Midazolam 0.1-0.2 mg/kg IV/IO/IM/IN** May repeat in 3-5 minutes as needed to max **5 mg**.
 - Cardioversion Procedure. **Initial dose 1 J/kg. Repeat second dose if needed 2 J/kg.**

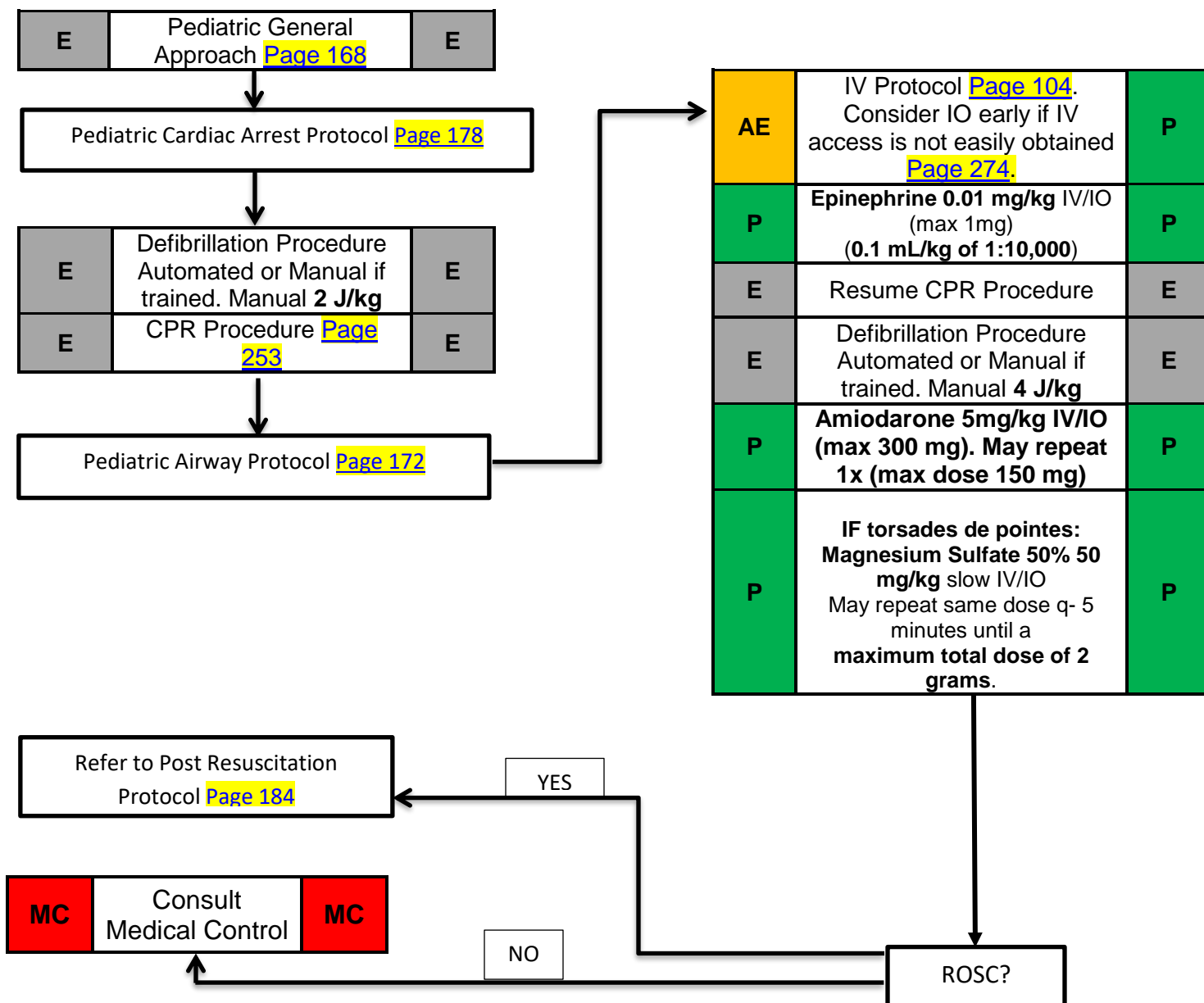
Contact Medical Control for consideration of the following:

- If symptoms persist administer **5 mg/kg IV/IO Amiodorone over 20 minute**. Max dose **150mg**
- 12 Lead EKG Procedure if conversion
- If patient is **NOT** Pre-arrest or Unstable (Altered mental status, no palpable BP) perform the following:
 - Vagal Maneuvers
 - **Adenosine 0.1 mg/kg rapid IV/IO bolus (max dose 6 mg)** May repeat at **0.2mg/kg** for 2nd & 3rd dose (max dose **12 mg**) if unsuccessful
 - If no response, **Amiodorone 5 mg/kg IV/IO over 20 minutes. Max 150 mg.**
 - 12 Lead EKG Procedure if conversion

Pediatric-Supraventricular Tachycardia

Pediatric-VFib/VTach

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC



Pediatric-VFib/VTach

Pediatric-VFib/VTach

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

History:

Events leading to arrest
Estimated downtime
Past medical history
Medications
Existence of terminal illness
FBAO
Hypothermia

Signs & Symptoms:

Unresponsive
Cardiac Arrest

Differential:

Respiratory failure
Foreign body
Hyperkalemia
Infection (croup, epiglottitis)
Hypovolemia (dehydration)
Congenital heart disease
Trauma
Tension pneumothorax
Hypothermia
Toxin or medication
Hypoglycemia

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General Approach Protocol [Page 168](#)
- Refer to Pediatric Cardiac Arrest Protocol [Page 178](#)
- Defibrillation procedure (AED) when advised to do so [Page 254](#)
- CPR Procedure as needed in between shocks. [Page 253](#)
- Refer to Pediatric-Airway Protocol early as potential cause of cardiac arrest can stem from an airway issue
- Perform CPR Procedure and Defibrillation Procedure according to algorithm above and in cooperation with Paramedics

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

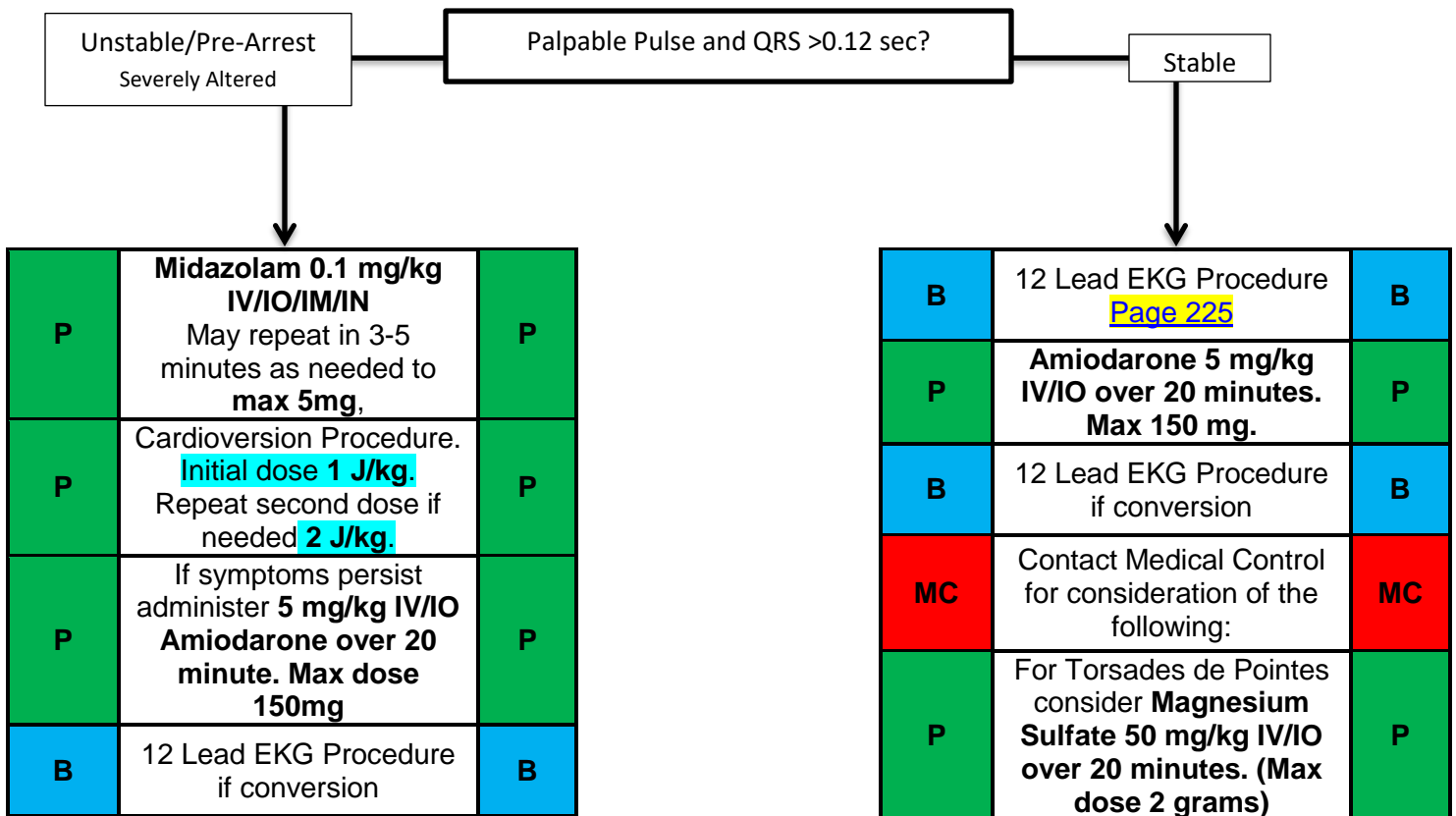
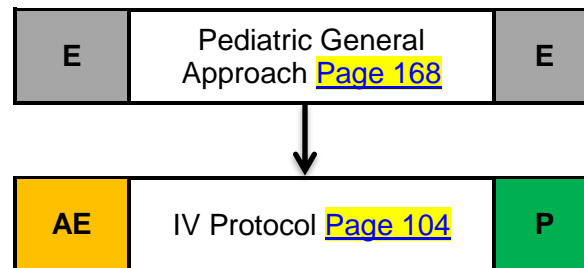
Paramedic- Perform/Confirm All Above Interventions

- Confirm the presence of ventricular fibrillation/pulseless ventricular tachycardia
- Defibrillate at **2 J/kg (maximum of 200J)**
 - Continue compressions while defibrillator charges
 - Immediately resume CPR after shock
 - Check rhythm after 2 minutes of CPR
- Using the most readily available route (give drug during CPR)
 - **Epinephrine 1:10,000 at 0.01 mg/kg IV/IO**
 - Repeat Epinephrine as above every 3-5 minutes
 - Flush medication with **10-20 ml of normal saline** after each dose
- If shockable rhythm persists, Defibrillate at **4 J/kg**
 - Continue compressions while defibrillator charges
 - Immediately resume CPR after shock
 - Check rhythm after 2 minutes of CPR
 - **Amiodarone 5 mg/kg IV/IO bolus (give during CPR) (max dose 300mg)**
 - **Magnesium 50 mg/kg IV/IO bolus for suspected torsades de pointes (max dose 2g)**
- If shockable rhythm persists, Defibrillate at 4 J/kg
 - Continue compressions while defibrillator charges
 - Immediately resume CPR after shock
 - Check rhythm after 2 minutes of CPR
- Continue cycle
- If ROSC is obtained refer to Pediatric-Post Resuscitation Protocol

Pediatric-VFib/VTach

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Wide Complex Tachycardia



Pediatric-Wide Complex Tachycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Wide Complex Tachycardia

History:

- Past medical history, medications, diet, drugs
- Syncope / Near syncope
- Palpitations
- Pacemaker
- Allergies: Lidocaine, Novocaine

Signs and Symptoms:

- Ventricular Tachycardia on ECG (Runs or Sustained)
- Conscious, rapid pulse
- Chest Pain, Shortness of Breath
- Dizziness
- Rate usually 150-180 bpm for sustained VTach
- QRS > 0.12 sec

Differential:

- Artifact / Device Failure
- Cardiac
- Endocrine/Electrolyte
- Drugs/Toxic exposure
- Pulmonary disease

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General Approach Protocol [Page 168](#)

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

- Palpable Pulse and QRS >0.12 sec?
- If patient is Unstable/Pre-Arrest Severely Altered perform the following:
 - If time permits, **Midazolam 0.1-0.2 mg/kg IV/IO/IM/IN** May repeat in 3-5 minutes as needed to **max 5 mg**.
 - Cardioversion Procedure. **Initial dose 1 J/kg**. Repeat second dose if needed **2 J/kg**.
 - If symptoms persist administer **5 mg/kg IV/IO Amiodarone** over 20 minute. Max dose **150mg**
 - 12 Lead EKG Procedure if conversion
- If patient is **NOT** Pre-arrest or Unstable (Altered mental status) perform the following:
 - 12 Lead EKG Procedure
 - If symptoms persist administer **5 mg/kg IV/IO Amiodarone** over 20 minute. Max dose **150mg**
 - 12 Lead EKG Procedure if conversion

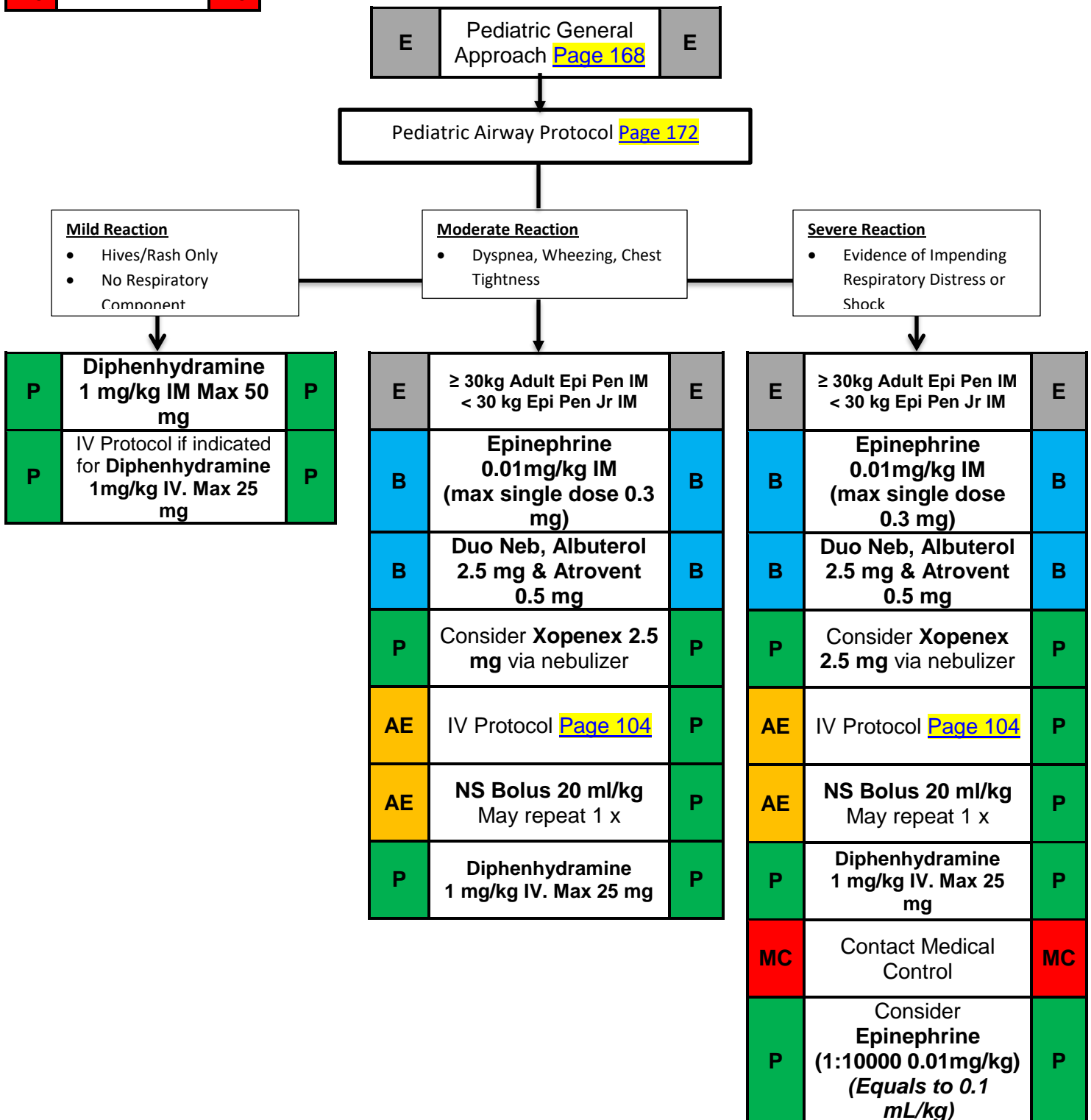
Contact Medical Control for consideration of the following:

- For Torsades de Pointes consider **Magnesium Sulfate 50 mg/kg IV/IO** over 20 minutes. (Max dose **2 grams**)

Pediatric-Wide Complex Tachycardia

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Allergic Reaction



Pediatric-Allergic Reaction

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Allergic Reaction

History

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

Signs & Symptoms

- Edema / Voice Changes
- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock

Differential

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

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)
- Pediatric-Airway Protocol [Page 172](#)

Mild Reaction- *Hives/Rash Only, No Respiratory Component*

- Supplemental O2 as tolerated

Moderate Reaction- *Dyspnea, Wheezing, Chest Tightness*

- <30 kg, **Epi Pen Jr IM**
- >30kg, **Epi Pen Adult IM**

Severe Reaction- *Evidence of Impending Respiratory Distress or Shock*

- <30 kg, **Epi Pen Jr IM**
- >30kg, **Epi Pen Adult IM**

Basic-Perform/Confirm All Above Interventions

Mild Reaction- *Hives/Rash Only, No Respiratory Component*

- Confirm Above Interventions

Moderate Reaction- *Dyspnea, Wheezing, Chest Tightness*

- **Duo Neb, Albuterol 2.5 mg & Atrovent 0.5 mg**

Severe Reaction- *Evidence of Impending Respiratory Distress or Shock*

- **Duo Neb, Albuterol 2.5 mg & Atrovent 0.5 mg**

Pediatric-Allergic Reaction

Pediatric-Allergic Reaction Cont.

A-EMT- Perform/Confirm All Above Interventions

Mild Reaction- *Hives/Rash Only, No Respiratory Component*

- IV Protocol [Page 104](#)

Moderate Reaction- *Dyspnea, Wheezing, Chest Tightness*

- **Epinephrine 0.01mg/kg IM (max single dose 0.3mg)**
- IV Protocol [Page 104](#)
- **NS bolus 20 mL/kg**

Severe Reaction- *Evidence of Impending Respiratory Distress or Shock*

- **Epinephrine 0.01mg/kg IM (max single dose 0.3mg)**
- IV Protocol [Page 104](#)
- **NS bolus 20 mL/kg**

Paramedic- Perform/Confirm All Above Interventions

Mild Reaction- *Hives/Rash Only, No Respiratory Component*

- **Diphenhydramine 1 mg/kg IM Max 50 mg**
- IV Protocol if indicated for **Diphenhydramine 1 mg/kg IV. Max 25 mg**

Moderate Reaction- *Dyspnea, Wheezing, Chest Tightness*

- **Epinephrine 0.01mg/kg IM (max single dose 0.3mg) (1:1000)**
- IV Protocol [Page 104](#)
- **NS bolus 20 mL/kg**
- **Diphenhydramine 1 mg/kg IM Max 50 mg**
- Consider **Xopenex 2.5 mg** via nebulizer

Severe Reaction- *Evidence of Impending Respiratory Distress or Shock*

- **Epinephrine 0.01mg/kg IM (max single dose 0.3mg)**
- IV Protocol [Page 104](#)
- **NS bolus 20 mL/kg**
- **Diphenhydramine 1 mg/kg IM Max 50 mg**
- Consider **Xopenex 2.5 mg** via nebulizer

Contact Medical Control for the consideration of the following:

- Consider **Epinephrine (1:10,000 0.01mg/kg) (Equals to 0.1 mL/kg)**

Pediatric-Allergic Reaction

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Altered Mental Status

E	Pediatric General Approach Page 168	E
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Refer to Pediatric Airway Protocol if Indicated [Page 172](#)

B	Blood Glucose Analysis Procedure Page 242	B
AE	IV Protocol Page 104	P
B	Spinal Protection Procedure if Indicated Page 261	B
B	12 Lead EKG Procedure Page 225	B

Blood Glucose <60 or >250 mg/dL

Refer to Pediatric Diabetic Protocol [Page 198](#)

Refer to Appropriate Pediatric Cardiac Protocol [Pages 178-190](#)

Signs of Shock or Poor Perfusion

Refer to Pediatric Hypotension (Non-Shock) Protocol [Page 200](#)

Signs of OD or Toxicology Related

Refer to Pediatric Overdose, Poisoning, Ingestion Protocol [Page 208](#)

Signs of Hypo/Hyperthermia

Refer to Adult Hypo/Hyperthermia Protocol [Page 98-101](#)

Pediatric-Altered Mental Status

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Altered Mental Status

History:

- Known Diabetic
- 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 or other)
- Thyroid (hyper/hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper/hypo)
- Toxicologic or Ingestion
- Acidosis/Alkalosis
- Environmental exposure
- Pulmonary (hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

Emergency Medical Responder

- Pediatric General approach Protocol [Page 168](#)
- Refer to Pediatric Airway Protocol if indicated [Page 172](#)
- If any signs of shock or poor perfusion, refer to Pediatric Hypotension (Non-Shock) Protocol [Page 200](#)
- If any signs of overdose or toxicology related issues, refer to Pediatric Overdose, Poisoning, Ingestion Protocol [Page 208](#)
- If any signs of hypo/hyperthermia, refer to Adult Hypo/Hyperthermia Protocol [Page 98-101](#)

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure
 - If <60 mg/dL or >250 mg/dL refer to Pediatric Diabetic Protocol [Page 198](#)
- 12 Lead EKG Procedure [Page 225](#)
- If any concerns with 12 Lead EKG Procedure, refer to appropriate cardiac rhythm protocol [Pages 178-190](#)
- Spinal Protection Procedure if indicated [Page 261](#)

A-EMT- Perform/Confirm All Above Interventions

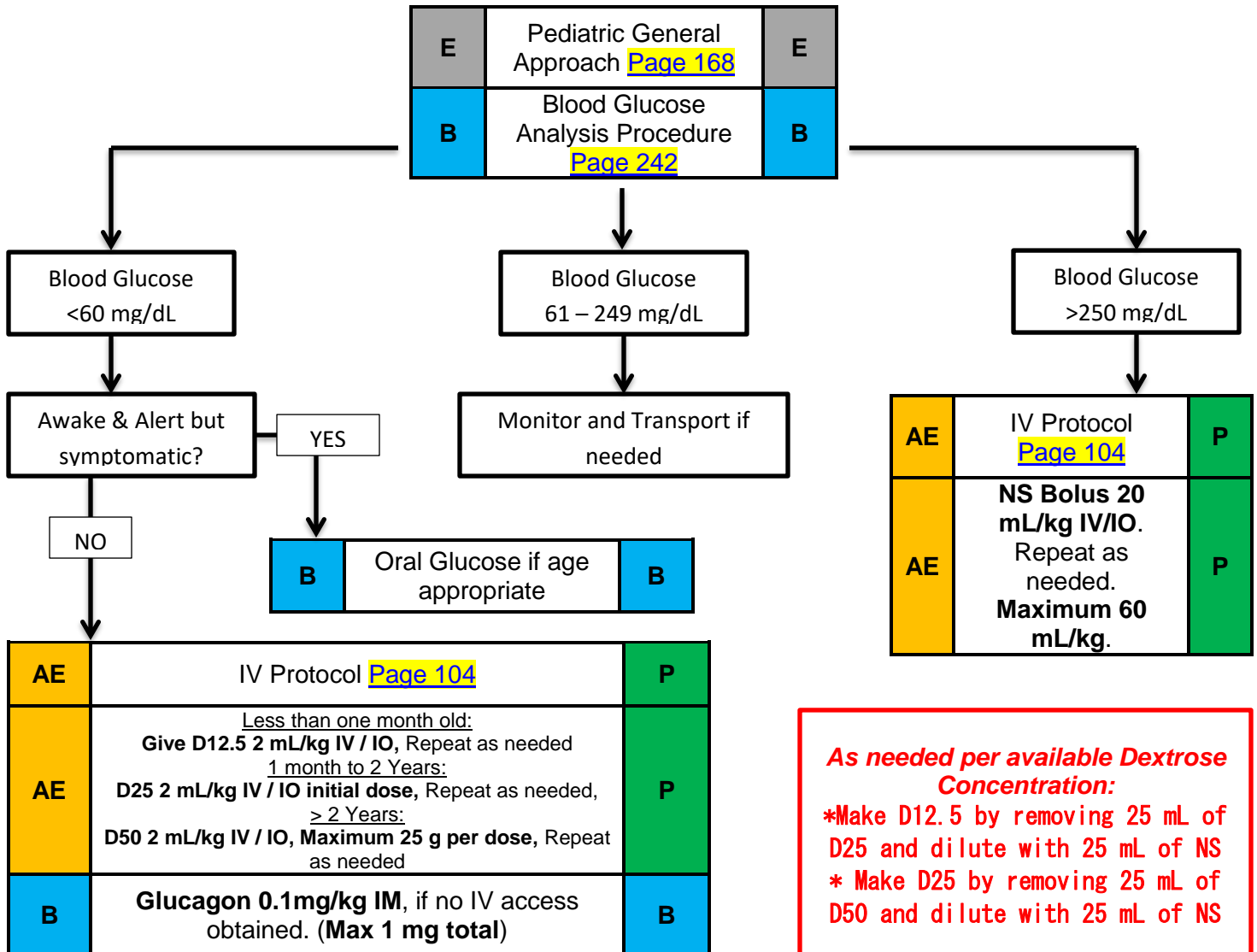
Paramedic- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Pediatric-Altered Mental Status

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Diabetic Emergencies



As needed per available Dextrose Concentration:

*Make D12.5 by removing 25 mL of D25 and dilute with 25 mL of NS

* Make D25 by removing 25 mL of D50 and dilute with 25 mL of NS

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Diabetic Emergencies

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.

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- If blood glucose is <60 mg/dL, determine if patient is awake and alert and symptomatic
 - If patient is awake and alert, administer **15g or tube of oral glucose** if age appropriate
 - If patient is unresponsive or showing signs of hypoglycemia, **Glucagon 0.1mg/kg IM up to 1 mg total**
- If blood glucose is 61-250 mg/dL monitor patient and transport if indicated
- If blood glucose is above 250mg/dL refer to Paramedic criteria

A-EMT- Perform/Confirm All Above Interventions

Paramedic- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- If blood glucose is <60 mg/dL
 - Less than one month old:
 - **Give D12.5 2 mL/kg IV / IO, Repeat as needed**
 - 1 month to 2 years:
 - **D25 2 ml/kg IV/IO initial dose, Repeat as needed**
 - >2 years:
 - **D50 2 mL/kg IV / IO, Maximum 25 g per dose, Repeat as needed**
- If blood glucose is 61-250 mg/dL monitor patient and transport if indicated
- If blood glucose is >250 mg/dL
 - **20 mL/Kg NS bolus. May repeat up to total 60 mL/kg**

As needed per available Dextrose Concentration:

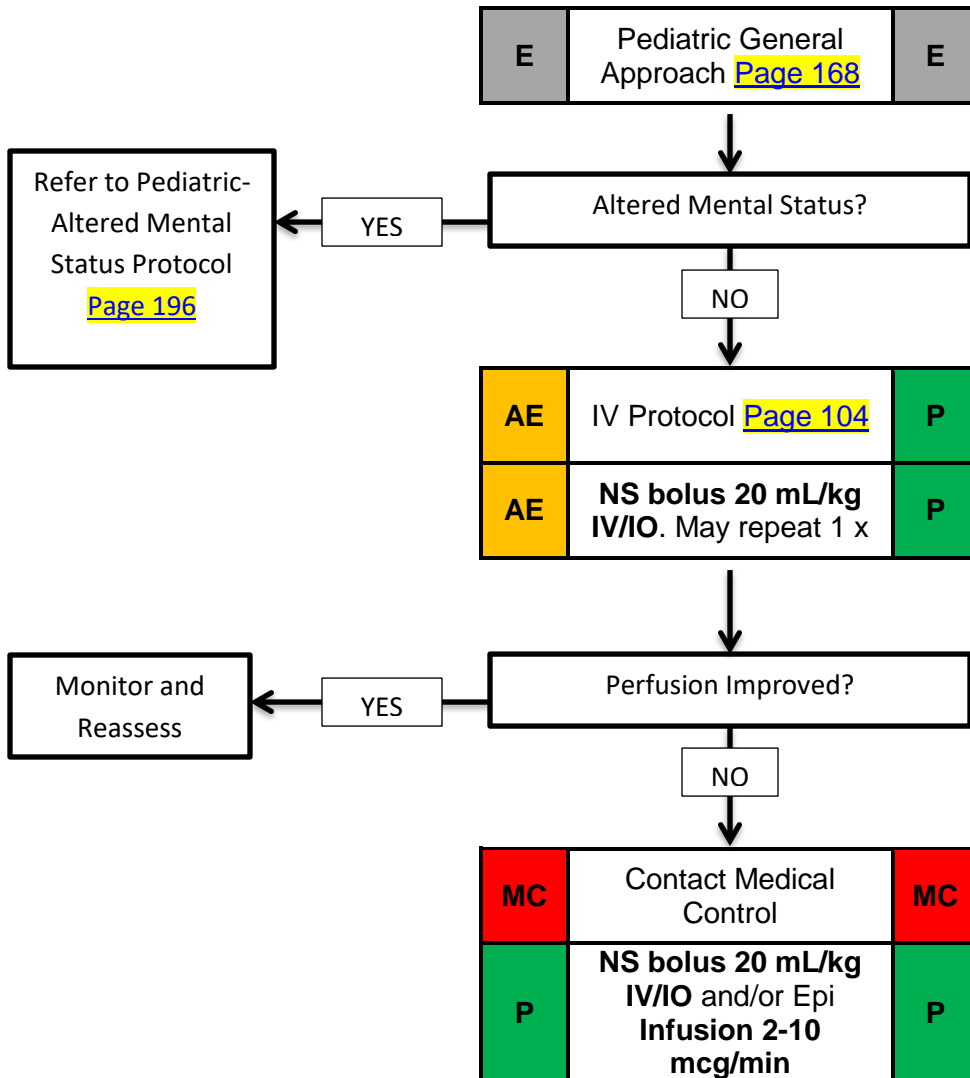
***Make D12.5 by removing 25 mL of D25 and dilute with 25 mL of NS**

*** Make D25 by removing 25 mL of D50 and dilute with 25 mL of NS**

Pediatric-Diabetic Emergencies

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Hypotension (Non-Shock)



Pediatric-Hypotension (Non-Shock)

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Hypotension (Non-Shock)

History:

- Vomiting
- Diarrhea
- Fever
- Infection
- Sick contacts
- PO intake
- Last wet diaper/urine

Signs and Symptoms:

- Restlessness, confusion, weakness
- Syncope
- Tachycardia
- Diaphoresis
- Pale, cool, clammy skin
- Delayed capillary refill

Differential:

- Infection/Sepsis
- Dehydration
- Vomiting
- Diarrhea
- Congenital heart disease
- Medication or Toxin
- Anaphylaxis
- Meningitis

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General Approach Protocol [Page 168](#)
- If patient has an altered mental status, refer to Pediatric Altered Mental Status Protocol [Page 196](#)

A-EMT- Perform/Confirm All Above Interventions

Paramedic- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- **NS bolus 20 mL/kg IV/IO.** May repeat 1x.
- Has perfusion improved?
 - If so, monitor and reassess
 - If **NOT**,

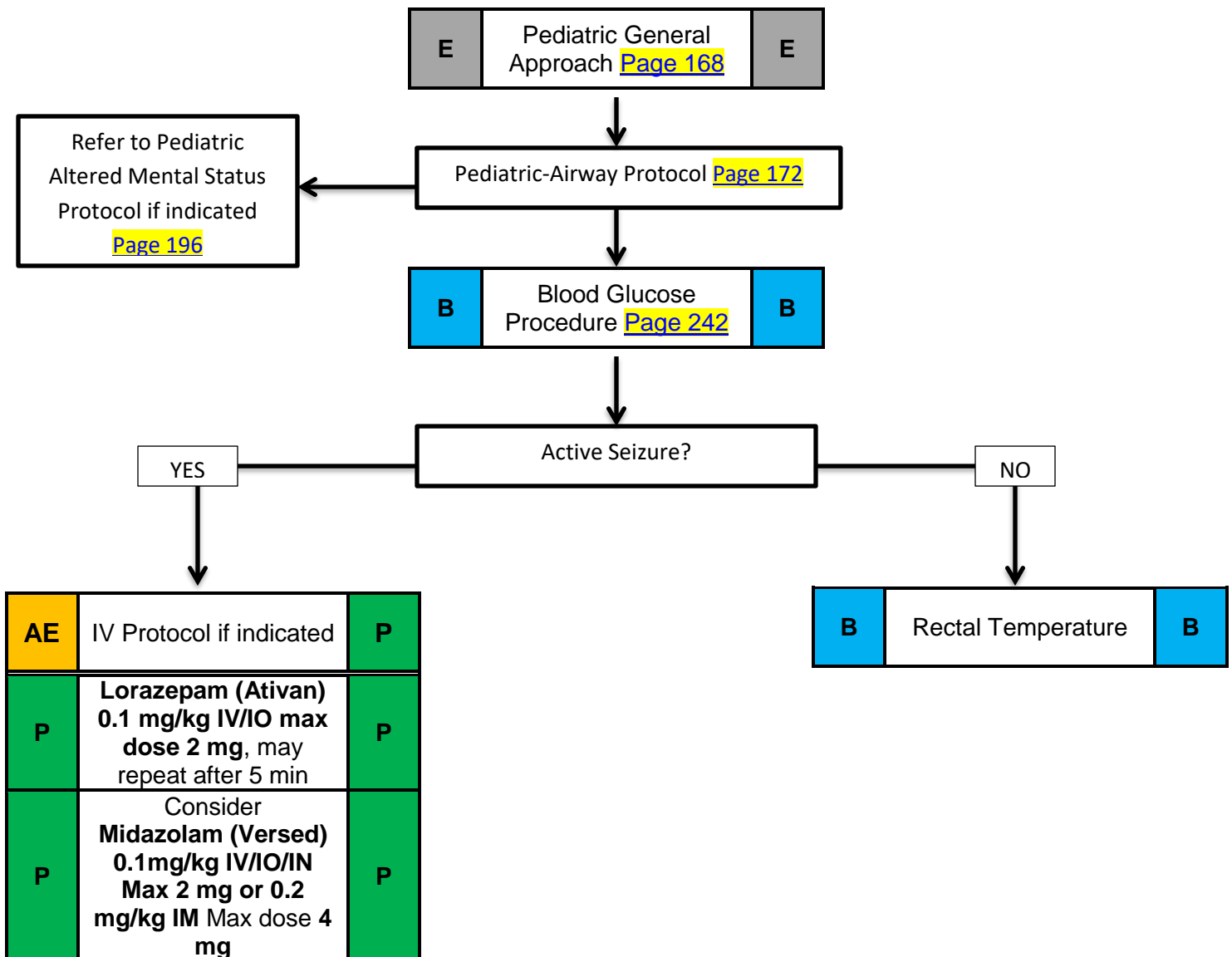
Contact Medical Control for the consideration of the following:

- **NS bolus 20 mL/kg IV/IO and/or Epi Infusion 2-10 mcg/min IV/IO**

Pediatric-Hypotension (Non-Shock)

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Seizures



Pediatric-Seizure

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Seizures

History:

- Sick contacts
- Prior history of seizures
- Medication compliance
- Recent head trauma
- Whole body vs unilateral seizure activity
- Duration
- Single/multiple

Signs & Symptoms:

- Fever
- 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

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)
- Pediatric-Airway Protocol [Page 172](#)
- Refer to Pediatric Altered Mental Status Protocol if indicated [Page 196](#)

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- If patient was previously seizing, perform Rectal Temperature

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol if indicated [Page 104](#)

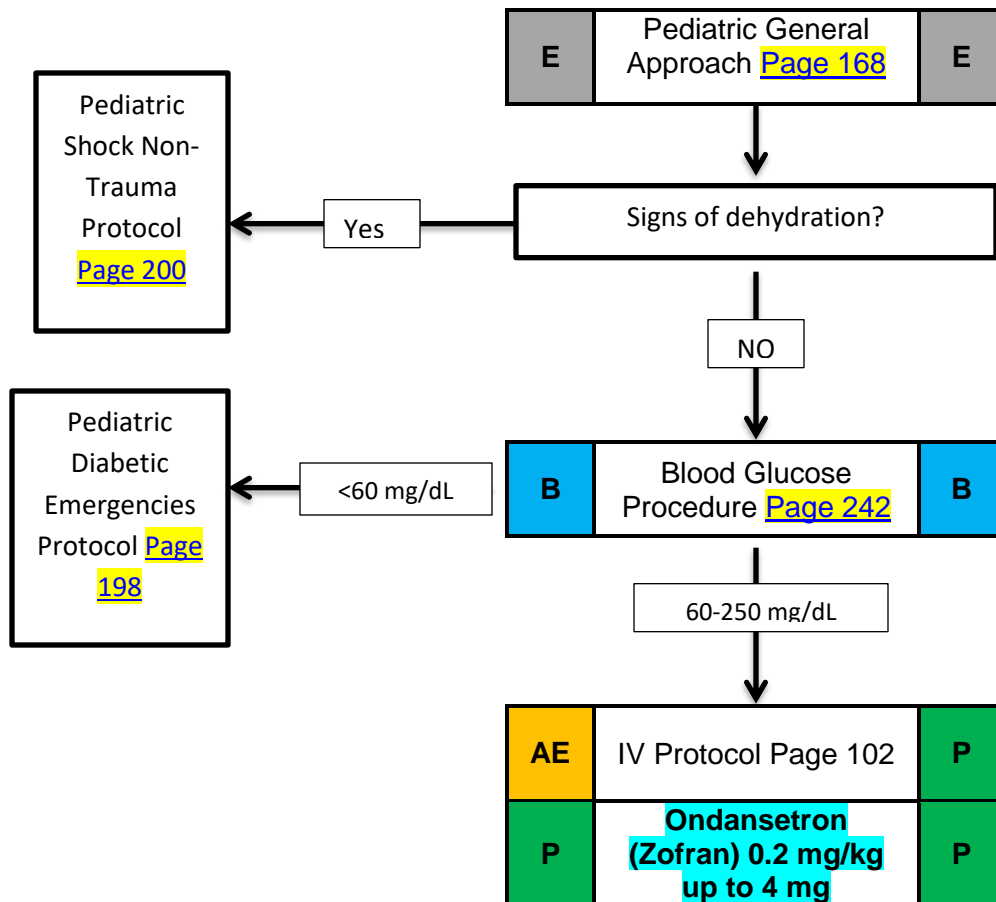
Paramedic- Perform/Confirm All Above Interventions

- If patient is actively seizing,
 - **Lorazepam (Ativan) 0.1 mg/kg IV/IO** may repeat after 5 min if seizing continues
 - Consider: **Midazolam (Versed) 0.1mg/kg IV/IO/IN** Max dose **2mg or 0.2 mg/kg IM**.

Pediatric-Seizure

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Nausea & Vomiting



LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Nausea & Vomiting

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

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General Approach Protocol [Page 168](#)
- If signs of dehydration, refer to Pediatric Shock (Non-Trauma) Protocol [Page 200](#)
- Blood Glucose Analysis Procedure [Page 242](#)
 - If <60 mg/dL refer to Pediatric Diabetic Emergencies Protocol [Page 198](#)

A-EMT- Perform/Confirm All Above Interventions

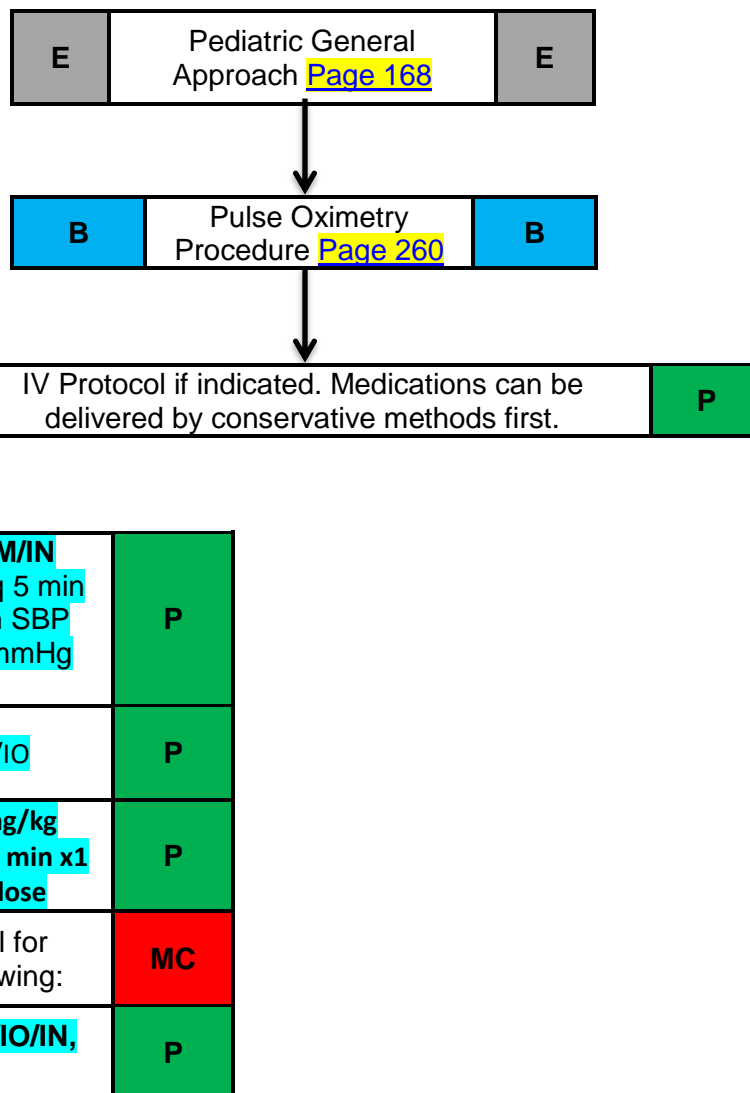
- IV Protocol [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

- **Ondansetron (Zofran) 0.2 mg/kg up to 4 mg**

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Pain Management



Pediatric-Pain Management

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Pain Management

History:

- Age
- Location
- Duration
- Severity (1-10)
- Past Medical History
- Medications
- Drug allergies
- Medications taken prior to arrival

Signs and Symptoms:

- Severity (pain scale)
- Quality
- Radiation
- Relation to movement, respiration
- Increased with palpation of area.

Differential:

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

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)

Basic-Perform/Confirm All Above Interventions

- Pulse Oximetry Procedure [Page 260](#)

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol if indicated [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

- Medications can be delivered by conservative methods first.
- **Fentanyl 1 mcg/kg IV/IM/IN**
 - Repeat **0.5 mcg/kg PRN q 5 min**
 - (**Max total 100 mcg**) with SBP >70 + (age in years x 2) mmHg
- **Morphine 0.1 mg/kg IV/IO**
- **Midazolam (Versed) 0.1 mg/kg IV/IO/IN/IM may repeat in 5 min x1 Do not exceed 5 mg per dose**

Contact Medical Control for consideration for the following:

- **Ketamine 0.25 mg/kg IV/IO/IN or 0.5 mg/kg IM**

Pediatric-Pain Management

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Overdose, Poisoning, Ingestion

E	Pediatric General Approach Page 168	E
B	Blood Glucose Analysis Procedure Page 242	B
B	12 Lead EKG Procedure Page 225	B
AE	IV Protocol Page 104	P

Tricyclic & Tetracyclic	Hypotension, Arrhythmias, Wide QRS (>0.12). Sodium Bi-Carb 1 mEq/kg IV/IO
Calcium Channel blockers	Calcium Chloride 20 mg/kg slow IV/IO (maximum dose 1g)
Beta Blocker Toxicity	Bradycardia, hypotension, heart blocks: Atropine 0.02 mg/kg IV/IO (minimum dose 0.1 mg, maximum individual dose 0.5 mg) for bradycardia If the symptoms persist, Glucagon 0.1 mg/kg IV/IO (Maximum dose 1 mg)
Opiates	Naloxone 0.1 mg/kg IV/IO/IN up to 2 mg
Organophosphate & Cholinergic Poisoning	Dyspnea, bronchorrhea, lacrimation, vomiting/diarrhea, weakness, paralysis, seizures: Atropine 0.02 mg/kg IV/IO/IM (minimum dose 0.1 mg), repeat every 2 minutes if needed
Acute Dystonic Reaction	Acute uncontrollable muscle contractions Diphenhydramine (Benadryl) 1 mg/kg IV or IM (maximum dose 25 mg)

Pediatric-Overdose, Poisoning, Ingestion

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Overdose Tricyclic & Tetracyclic

Category	Drugs	Overdose Effects
Tricyclic Antidepressants	<ul style="list-style-type: none"> Amitriptyline (Elavil, Endep, Vanatrip, Levate) Clomipramine (Anafranil) Doxepin (Sinequan, Zonalon, Tridapin) Imipramine (Tofranil, Impril) Nortriptyline (Aventyl, Pamelor, Norventyl) Desipramine (Norpramin) Protriptyline (Vivactil) Trimipramine (Surmontil) Amitriptyline+Chlordiazepoxide (Limbitrol) 	<ul style="list-style-type: none"> Hypotension Anti-cholinergic effects (tachycardia, seizures, altered mental status, mydriasis) AV conduction blocks (prolonged QT interval, wide QRS) VT and VF
Other Cyclic Antidepressants	<ul style="list-style-type: none"> Maprotiline (Ludiomil) Amoxapine (Asenden) Bupropion (Wellbutrin) Trazadone (Desyrel, Trazorel) 	<ul style="list-style-type: none"> Similar to Tricyclics Seizures
Selective Serotonin Reuptake Inhibitors (SSRIs)	<ul style="list-style-type: none"> Citalopram (Celexa) Fluoxetine (Prozac) Fluvoxamine (Luvox) Paroxetine (paxil) Sertraline (Zoloft) 	<ul style="list-style-type: none"> Hypertension, tachycardia, agitation, diaphoresis, shivering Malignant Hyperthermia

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- 12 Lead EKG Procedure [Page 225](#)

E-EMT-Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic-Perform/Confirm All Above Interventions

- Hypotension, Arrhythmias, Wide QRS (>0.12). **Sodium Bi-Carb 1 mEq/kg IV/IO**

Pediatric-Overdose Tricyclic & Tetracyclic

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Overdose Calcium Channel Blockers

Examples of commonly used Calcium Channel Blocker medication:

- Amlodipine (Norvasc)
- Felodipine (Plendil, Renedil)
- Isradipine (DynaCirc)
- Nicardipine (Cardene)
- Nifedipine (Procardia, Adalat)
- Verapamil (Calan)
- Diltiazem (Cardizem)

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- 12 Lead EKG Procedure [Page 225](#)

E-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

- **Calcium Chloride 20 mg/kg** slow IV/IO (maximum dose 1g)

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Overdose Beta Blocker Toxicity

Single Agent Medication	Combination Medication
<ul style="list-style-type: none"> Propranolol (Inderal) Atenolol (Tenormin) Metoprolol (Lopressor, Toprol) Nadolol (Corgard) Timolol (Blocadren) Labetolol (Trandate) Esmolol (Brevibloc) 	<ul style="list-style-type: none"> Corzide (Nadolol/bendroflumethazide) Inderide (Propranolol/HCTZ) Lopressor HCT (Metoprolol/HCTZ) Timolide (Timolo/HCTZ) Ziac (Bisoprolol/HCTZ) Tenoretic (Atenolol/Chlorthalidone)

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- 12 Lead EKG Procedure [Page 225](#)

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

- Bradycardia, hypotension, heart blocks:
 - **Atropine 0.02 mg/kg IV/IO** (minimum dose 0.1 mg, maximum individual dose 0.5 mg) for bradycardia
 - If the symptoms persist, **Glucagon 0.1 mg/kg IV/IO** (Maximum dose 1 mg)

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Overdose Opiates

Single Agent Medication	Combination Medication	Long Acting
<ul style="list-style-type: none"> • Oxycodone • Hydrocodone • Morphine • Heroin • Dilaudid • Fentanyl • Codiene 	<ul style="list-style-type: none"> • Vicodin • Norcodin • Percocet • Darvocet • Vicoprofen 	<ul style="list-style-type: none"> • Oxycontin • MS Contin • Methadone

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- 12 Lead EKG Procedure [Page 225](#)

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

- **Naloxone 0.1 mg/kg** IV/IO/IN up to 2 mg

Pediatric-Overdose Opiates

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Overdose Organophosphate & Cholinergic Poisoning

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)
- Wear protective clothing including masks, gloves and eye protection
 - Toxicity to ambulance crew may result from inhalation or topical exposure
- Supplemental 100% oxygen
- Decontaminate patient
 - Remove all clothing and contain run-off of toxic chemicals when flushing

Basic-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- 12 Lead EKG Procedure [Page 225](#)

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)

Paramedic- Perform/Confirm All Above Interventions

- Dyspnea, bronchorrhea, lacrimation, vomiting/diarrhea, weakness, paralysis, seizures:
 - **Atropine 0.02 mg/kg IV/IO** (minimum dose 0.1 mg), repeat every 2 minutes
- If any of the following conditions occur, refer to the appropriate protocol:
 - Altered Mental Status Protocol [Page 196](#)
 - Seizure Protocol [Page 202](#)

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Overdose Acute Dystonic Reaction

Examples of commonly used medications that may result in acute dystonic reactions:

- Haloperidol
- Prolixin
- Thorazine
- Prochlorperazine (Compazine)
- Promethazine (Phenergan)

Emergency Medical Responder

- Pediatric General Approach Protocol [Page 168](#)

Basic-Perform/Confirm All Above Interventions

A-EMT-Perform/Confirm All Above Interventions

- Blood Glucose Analysis Procedure [Page 242](#)
- 12 Lead EKG Procedure [Page 225](#)

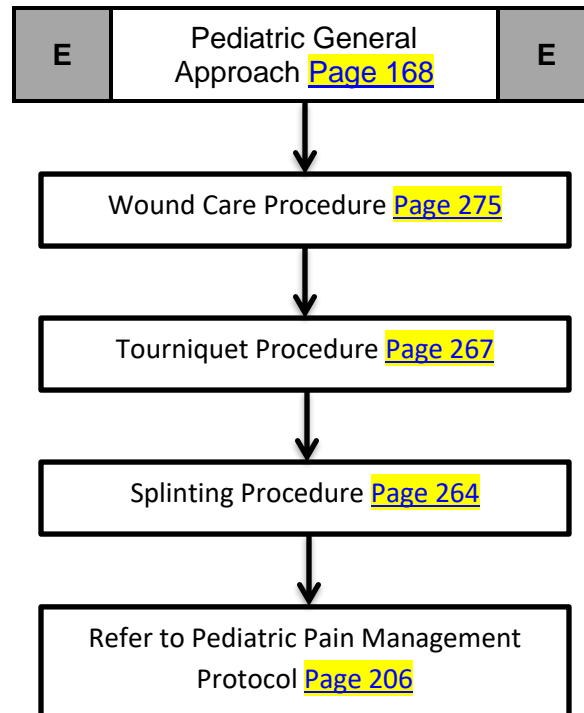
Paramedic- Perform/Confirm All Above Interventions

- Acute uncontrollable muscle contractions
 - **Diphenhydramine (Benadryl) 1 mg/kg IV or IM (maximum dose 25 mg)**

Pediatric-Overdose Acute Dystonic Reaction

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Extremity Trauma



If amputation:

- **Do not delay transport for tissue retrieval**
- Rinse amputated part with sterile (saline or water).
- Wrap part in saline moistened gauze
- Place tissue into plastic bag or container.
- Place bag / container on ice

Transport to the most appropriate facility.

Contact Medical Control

Consider helicopter transport.

Pearls:

- Peripheral neurovascular status should be documented on all extremity injuries and before and after splinting procedures.
- If pulseless extremity a single attempt at realignment may be performed.
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- If an amputation is incomplete, splint affected digit or limb in physiologic position.
- 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 should be evaluated for repair as soon as possible after injury.

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Extremity Trauma

History:

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

Signs & Symptoms:

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

Differential:

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

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

A-EMT- Perform/Confirm All Above Interventions

Paramedic- Perform/Confirm All Above Interventions

- Pediatric General Approach Protocol [Page 168](#)
- Wound Care Procedure [Page 275](#)
- Tourniquet Procedure [Page 267](#)
- Splinting Procedure [Page 264](#)
- Refer to Pain Management Protocol if indicated [Page 206](#)
- **Transport to most appropriate facility. Advise Medical Control**
- **Consider Helicopter**

If amputation:

- **Do not delay transport for tissue retrieval**
- Rinse amputated part with sterile (saline or water).
- Wrap part in saline moistened gauze
- Place tissue into plastic bag or container.
- Place bag / container

Pearls:

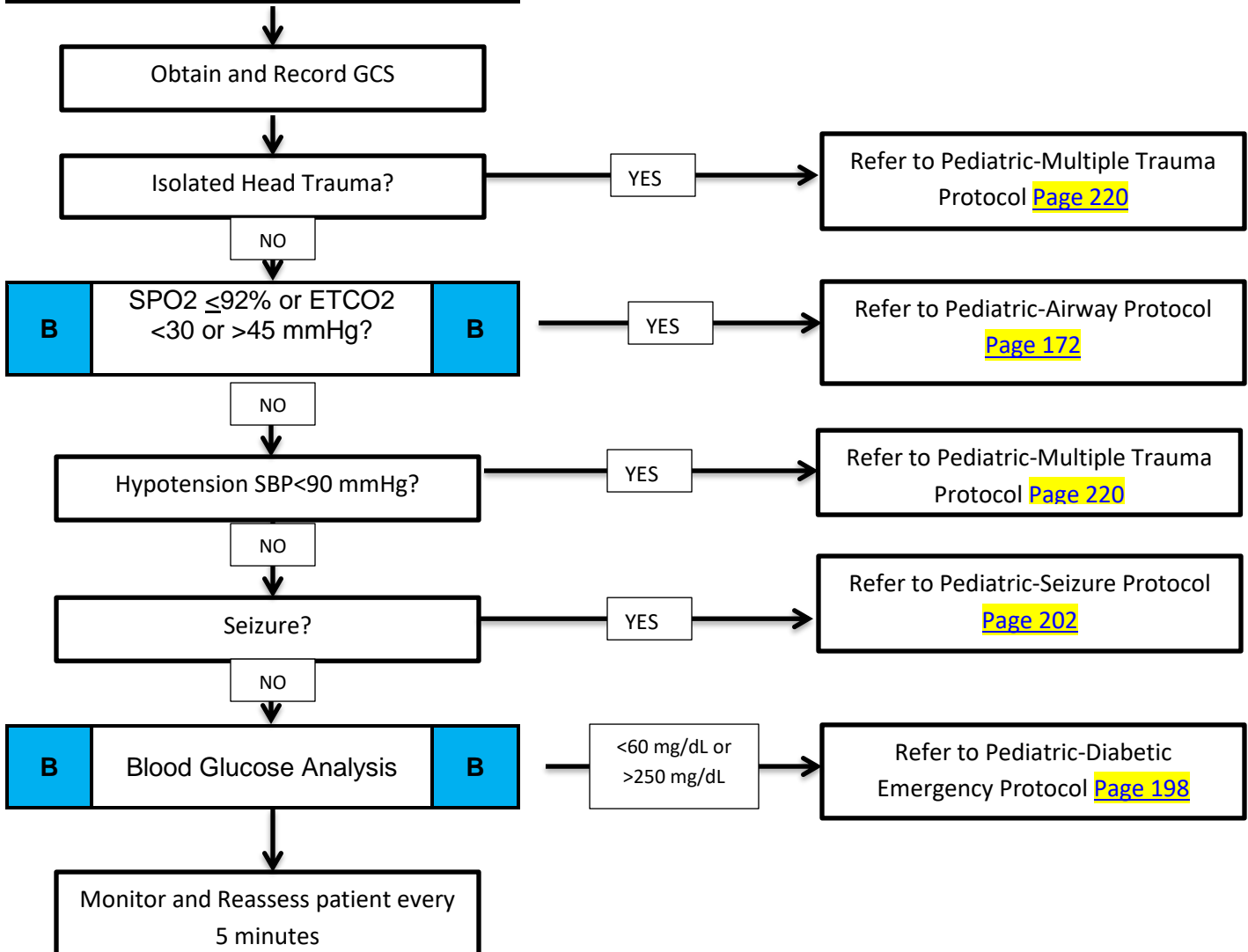
- Peripheral neurovascular status should be documented on all extremity injuries and before and after splinting procedures.
- If pulseless extremity a single attempt at realignment may be performed.
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- If an amputation is incomplete, splint affected digit or limb in physiologic position.
- 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 should be evaluated for repair as soon as possible after injury.

Pediatric-Extremity Trauma

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Head Trauma

E	Pediatric General Approach Page 168	E
B	Spinal Protection Procedure Page 261	B



LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Head Trauma

History:

- Time of injury
- Mechanism: blunt / penetrating
- Loss of consciousness
- Bleeding
- Medical history
- Medications
- Allergies
- Evidence of multi-trauma
- Helmet use or damage to helmet

Signs and Symptoms:

- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Significant mechanism of injury
- Pupillary abnormalities
- CSF leaking from ears, nose, mouth

Differential:

- Skull fracture
- Brain injury (concussion, contusion, hemorrhage, or laceration)
- Epidural/subdural hematoma
- Subarachnoid/intracranial hemorrhage
- Spinal injury
- Abuse

Emergency Medical Responder

- Pediatric General Approach [Page 168](#)

Basic-Perform/Confirm All Above Interventions

A-EMT- Perform/Confirm All Above Interventions

Paramedic- Perform/Confirm All Above Interventions

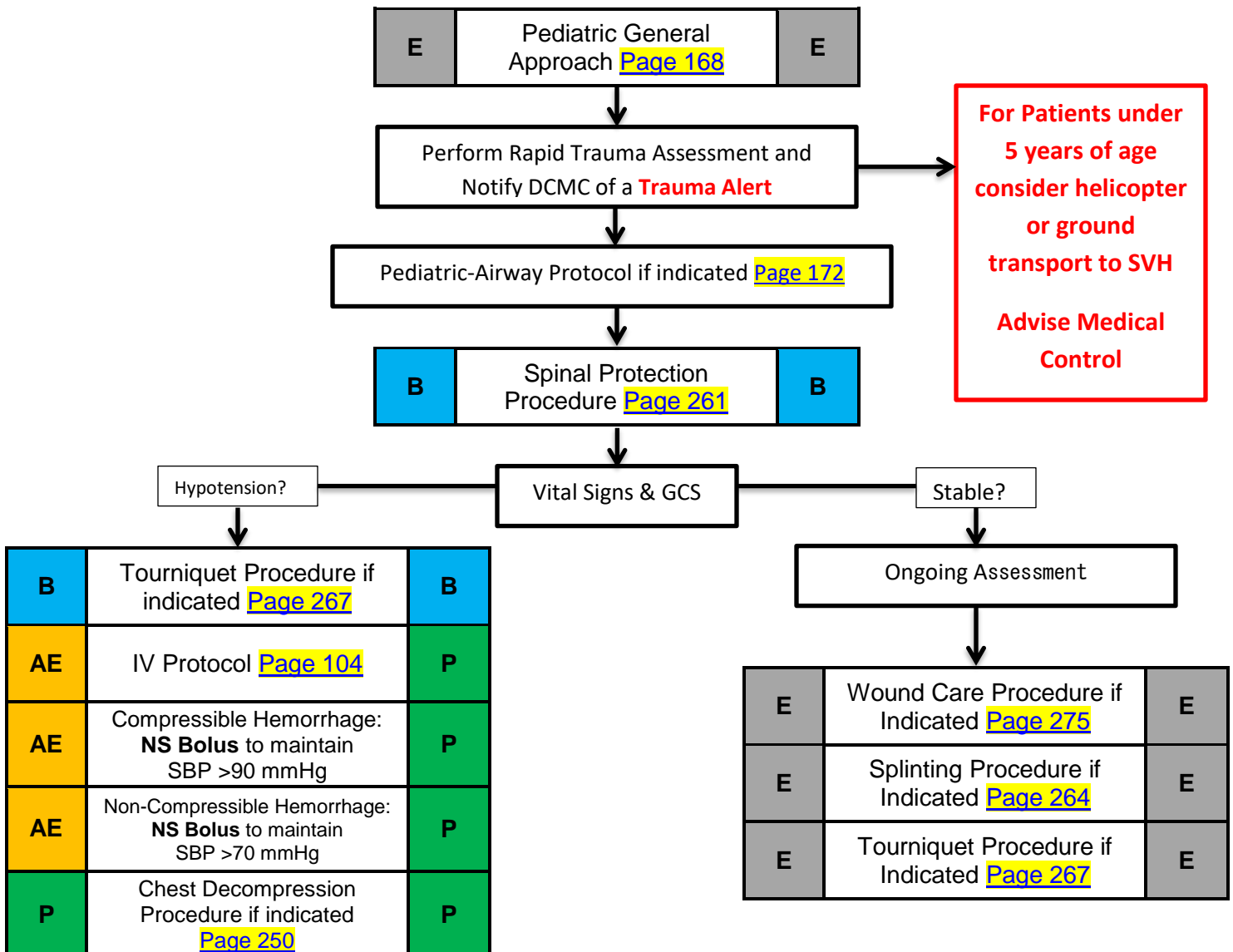
- Obtain and record GCS
- Isolated Head Trauma
 - Refer to Pediatric-Multiple Trauma Protocol [Page 220](#)
- SPO₂ ≤92% or ETCO₂ <30 mmHg or >45 mmHg?
 - Refer to Pediatric-Airway Protocol [Page 172](#)
- Hypotension SBP<90 mmHg?
 - Refer to Pediatric-Multiple Trauma Protocol [Page 220](#)
- Seizure?
 - Refer to Pediatric-Seizure Protocol [Page 202](#)
- Blood Glucose Analysis <60 mg/dL or >250 mg/dL
 - Refer to Pediatric-Diabetic Emergency Protocol [Page 198](#)

- 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-Head Trauma

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Multiple Trauma



LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

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 & Symptoms:

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Cardiac 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

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 $\geq 92\%$
- Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 12 years and older > 90 mmHg.
- Consider Chest Decompression with signs of shock and injury to torso and evidence of tension pneumothorax.
- 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.

For Patients under 5 years of age consider helicopter or ground transport to SVH

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General Approach [Page 168](#)
- Perform Rapid Trauma Assessment
- Notify DCMC of **Trauma Alert**
- Refer to Pediatric-Airway Protocol if indicated [Page 172](#)
- Refer to Spinal Protection Procedure if indicated [Page 261](#)
- Determine if vital signs and GCS are stable or unstable
 - Stable:
 - Conduct ongoing assessment
 - Refer to Wound Care Procedure if indicated [Page 275](#)
 - Refer to Splinting Procedure if indicated [Page 264](#)
 - Refer to Tourniquet Procedure if indicated [Page 267](#)

Pediatric-Multiple Trauma

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric-Multiple Trauma Cont.

Basic-Perform/Confirm All Above Interventions

- Unstable/ Hypotension:
 - Refer to Tourniquet Procedure if indicated [Page 267](#)

A-EMT- Perform/Confirm All Above Interventions

- Unstable/ Hypotension:
 - IV Protocol [Page 104](#)
 - Compressible Hemorrhage:
 - **NS Bolus** to maintain SBP >90 mm/Hg
 - Non-Compressible Hemorrhage:
 - **NS Bolus** to maintain SBP>70 mmHg

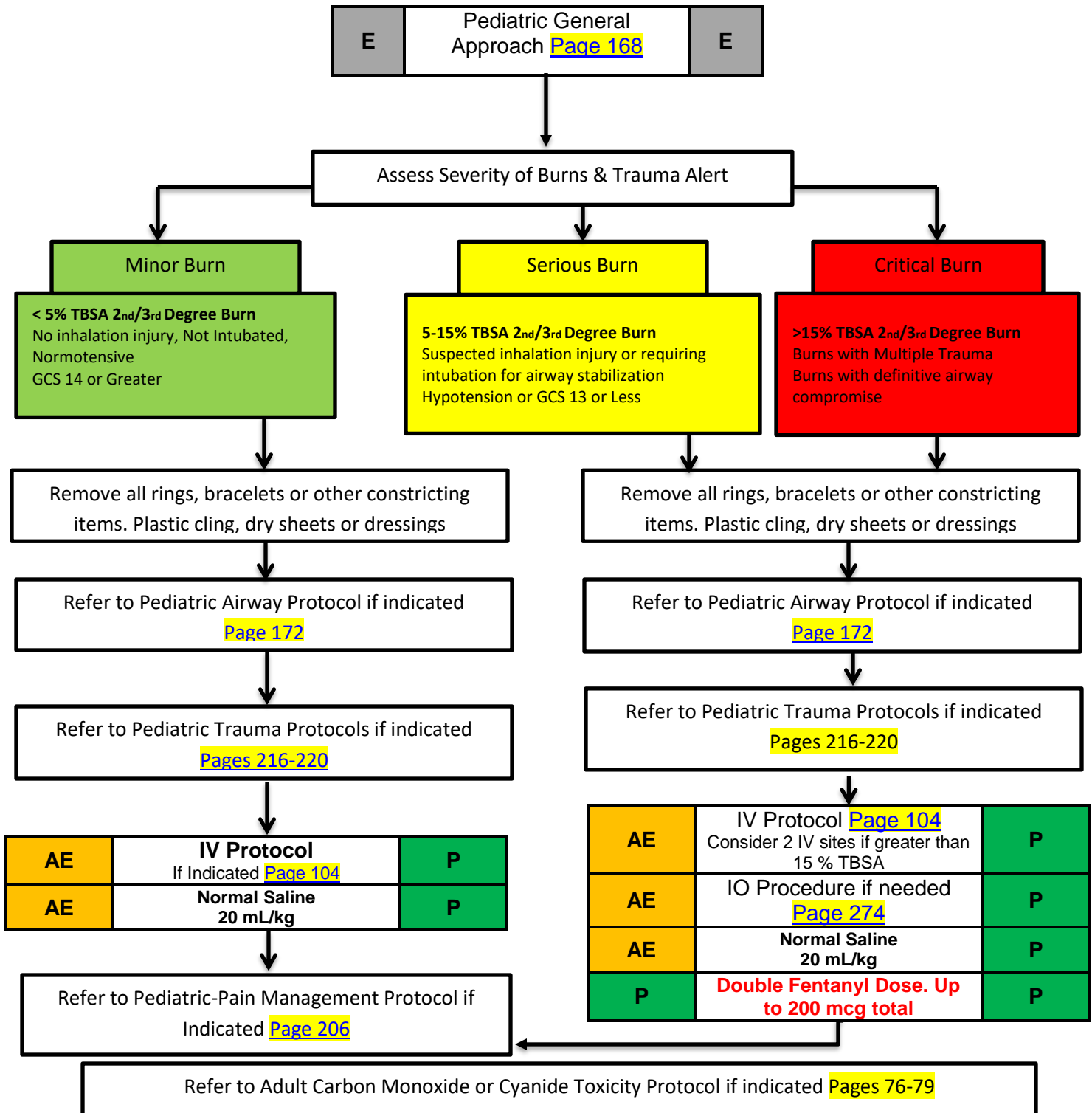
Paramedic- Perform/Confirm All Above Interventions

- Chest Decompression Procedure if indicated [Page 250](#)

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LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Thermal Burn



Pediatric-Thermal Burn

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

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

Emergency Medical Responder

Basic-Perform/Confirm All Above Interventions

- Pediatric General Approach [Page 168](#)
- Remove all clothing, contact lenses and jewelry especially rings
- Maintain core temperature. Keep patient warm and dry with sheets and blankets. Cover burns with plastic wrap, plastic chucks or clean dry dressings.
- If inhalation injury is suspected
 - Monitor ETCO2 continuously (if available)
- Estimate Total Body Surface Area (TBSA)
- Rule of Nines
 - For scattered burns, use the size of patient's hand, including fingers, to equal 1% burn.

A-EMT- Perform/Confirm All Above Interventions

- IV Protocol [Page 104](#)
- Place large bore peripheral IV's in unburned skin if possible
- Refer to IO Procedure if indicated [Page 274](#)
- **NS Bolus 20 mL/kg**
- Observe for signs of impending loss of airway; Refer to the Pediatric-Airway Protocol [Page 172](#) as needed:
 - Hypoxia
 - Poor ventilatory effort
 - Altered Mental status/decreased level of consciousness
 - Inability to maintain patent airway
 - Signs or Symptoms of Inhalation injury
 - Carbonaceous sputum
 - Extensive facial burns or facial edema
 - Hoarseness
 - Singed nasal hairs
 - Agitation, anxiety, cyanosis, stupor or other signs of hypoxia

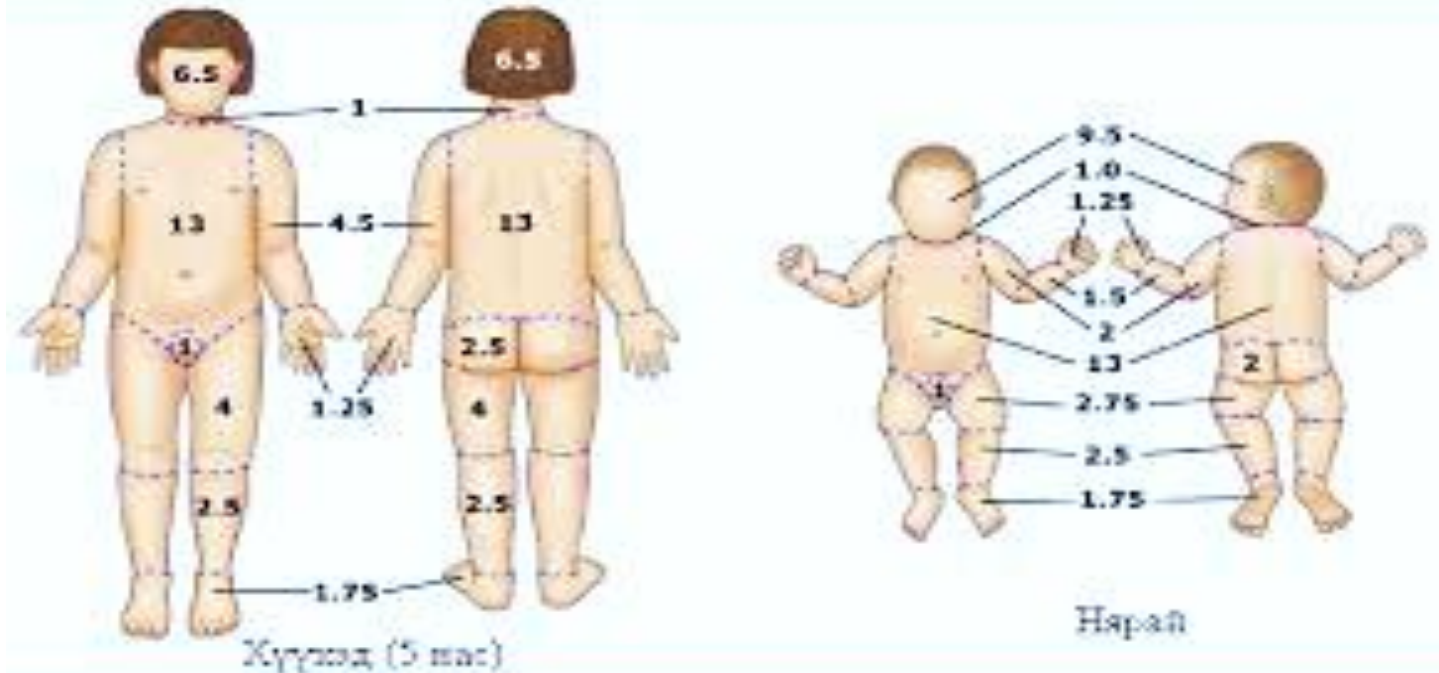
Paramedic- Perform/Confirm All Above Interventions

- **Double Fentanyl Dose. Up to 200 mcg total**
- **Refer to Pediatric Pain Management Protocol [Page 206](#)**
- Refer to Adult Hazmat-Carbon Monoxide Protocol if indicated [Page 78](#)
- Refer to Adult Hazmat-Cyanide Toxicity Protocol if indicated [Page 76](#)

Pediatric-Thermal Burn

LEGEND		
E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P
MC	Medical Control	MC

Pediatric Thermal Burn



Pearls:

- **Evaluate BSA : Use chart or use one side of patients hand = 1% BSA**
- **Critical Burns:**
 - >20% 2° and 3° body surface area (BSA) age > 10;
 - >10% BSA age < 10 or > 50;
 - 3° burns >5% BSA;
 - 2° and 3° burns to face, eyes, hands or feet or genitalia; electrical burns; respiratory burns; deep chemical burns;
 - Burns with extremes of age or chronic disease; and burns with associated major traumatic injury.
- Minor burns (< 5% BSA 2nd and 3rd) not complicated by airway compromise or trauma do not require transport to a trauma center.
- Potential CO exposure should be treated with 100% oxygen.
- Circumferential burns to extremities are dangerous due to potential vascular compromise 2° to soft tissue swelling.
- Burn patients are prone to hypothermia - Never apply ice or cool burns that involve >10% body surface area.
- Do not overlook the possibility of multiple system trauma or child abuse with burn injuries.
- 2nd or 3rd degree burn >10% BSA – Fluid 20 mL/kg

Procedures

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12 Lead EKG

Clinical Indications:

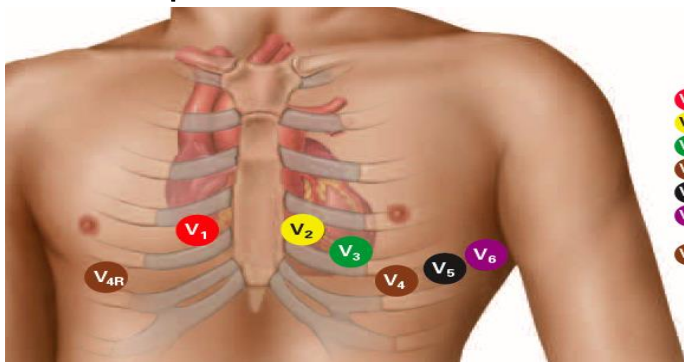
- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope
- CHF
- Abdominal pain above the umbilicus
- Undifferentiated respiratory complaints

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

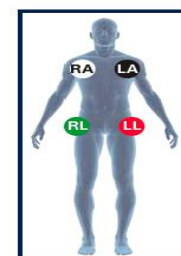
Procedure:

- 1) Assess patient and monitor cardiac status
- 2) If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12-Lead EKG
- 3) Prepare EKG monitor and connect patient cable to electrodes
- 4) Expose chest and prep as necessary. Modesty of the patient should be respected.
- 5) Apply chest leads and extremity leads using the following landmarks:
 - RA: Right arm or as directed by manufacturer
 - LA: Left arm or as directed by manufacturer
 - 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
- 6) Instruct patient to remain still
- 7) Press the appropriate button to acquire the 12-Lead EKG (complete age and gender questions correctly)
- 8) Print data as per guidelines and attach a copy of the 12-Lead to the PCR. Place the name and age of the patient on the paper copy of the EKG

If STEMI identified, notify STEMI Hospital immediately. Report STEMI alert and a detailed report to follow.



- V₁ 4th intercostal space to the right of the sternum
- V₂ 4th intercostal space to the left of the sternum
- V₃ directly between the leads V₂ & 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
(directly under the midpoint of the armpit)
- V_{4R} 5th intercostal space, right midclavicular line



- RA Right Arm
- LA Left Arm
- RL Right Leg
- LL Left Leg

Procedure 1

Airway– Nebulizer Inhalation Therapy

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

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 6 - 10 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. A mask may also be utilized.
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).
10. Along with pulse oximetry, ETCO₂ monitoring should also be considered.

Airway-Bougie (Endotracheal Tube Introducer)

Clinical Indications:

P	PARAMEDIC	P
---	-----------	---

- Patients meet clinical indications for oral intubation
- Initial intubation attempt for medical indication unsuccessful
- Predicted difficult intubation

Contraindications:

- ETT size less than 6.5mm.
- Already failed twice on medical indicated intubation attempts or failed on one trauma intubation attempt DO NOT UTILIZE BOUGIE.

Procedure:

1. Prepare, position, and oxygenate the patient with 100% Oxygen
2. Select proper ET tube without stylette, test cuff and prepare suction
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal ½ 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 consider 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. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth
8. 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)
9. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie
10. Confirm tracheal placement with capnography according to the intubation protocol. Inflate the cuff, auscultate for equal breath sounds and reposition accordingly.
11. When final position is determined secure the ET tube, continuously record and monitor capnography, reassess breath sounds and monitor patient to assure continued tracheal intubation.
12. If there is any question regarding placement of ETT (Esophageal vs. Tracheal) remove immediately and ventilate with BVM.

Airway-Capnography Waveform

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.
- Capnography should also be used on all patients treated with magnesium and/or epinephrine for respiratory distress.

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or any other oxygen delivery device, including bag-valve mask and nasal cannula.
2. Note CO₂ 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 CO₂ 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.

Airway-Continuous Positive Airway Pressure (CPAP)

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

For patients with Acute Bronchospastic Disorders (acute or chronic bronchitis, emphysema, or asthma) or Acute Pulmonary Edema, who have hypoxemia and/or respiratory distress that does not quickly improve with pharmaceutical treatment.

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

1. Awake and able to follow commands
2. Is over 12 years old and is able to fit the CPAP mask
3. Has the ability to maintain an open airway
4. And exhibits two or more of the following;
 - A. a respiratory rate greater than 25 breaths per minute
 - B. SPO2 of less than 94% at any time
 - C. use of accessory muscles during respirations

Exclusion Criteria:

1. Patient is in respiratory arrest/apneic
2. Patient is suspected of having a pneumothorax or has suffered trauma to the chest
3. Patient has a tracheostomy
4. Patient is actively vomiting or has upper GI bleeding
5. Patient has an altered mental status

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. Ensure continuous pulse oximetry is initiated.
7. Initiate procedure with **5 cm H2O of PEEP**.
8. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
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).

Removal Procedure:

1. CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask or experiences respiratory arrest or begins to vomit.
2. Ensure that patient maintains adequate ventilation and if not, consider alternative airway procedure/ protocol.

*****MAY USE E700 AUTOMATIC TRANSPORT VENTILATOR SET TO CPAP MODE AT 5 CM H2O PEEP IN PLACE OF THE FLOW-SAFE CPAP SYSTEM, CONTACT MEDICAL CONTROL IF INCREASE IN PEEP IS NEEDED*****

Procedure 5

Airway-Foreign Body Obstruction

Clinical Indications:

Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

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 may 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, 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).

Procedure 6

Airway-King LTD

Clinical Indication:

To establish control of the patient's airway and to facilitate ventilation for the listed indications.

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Indications:

When an alternative airway device is needed in the management of respiratory failure in patients.

Contraindications:

- Intact gag reflex
- Patients with known esophageal disease
- Patients who have ingested caustic substances
- Patient with known tracheal obstruction
- Patient with a tracheostomy or laryngectomy

Equipment:

- Correctly sized LTA (see chart below)
- Bag valve mask
- Oxygen reservoir
- Suction device
- Bite block and/or endotracheal tube holder (if available)
- Appropriately sized syringes for expanding cuff
- End Tidal CO2 and oxygen saturation monitoring devices

Procedure:

1. Pre-oxygenate patient with 100% Oxygen via Bag Valve Mask or spontaneous ventilation to achieve O2 saturation of >93% if possible
2. Check the integrity of the cuff inflation system and pilot balloon
3. Tightly deflate the cuff with the syringe
4. Lubricate the posterior distal tip of the LTA with a water soluble lubricant
5. Place patient in neutral sniffing position (if no c-spine/spinal injury suspected)
 - For patients with suspected c-spine injury, perform two-person insertion technique
 - One person maintains manual in-line cervical spine stabilization while the other person proceeds with procedure.

Airway-King LTD Cont.

Procedure (Continued):

1. Pull mandible down to open mouth
2. Insert uninflated LTA into oral cavity with midline or a lateral technique
3. Advance the tip behind the base of the tongue while rotating tube back to midline so that the blue orientation line faces the chin of the patient.
4. Without exerting excessive force, advance tube until base of the colored connector is aligned with teeth or gums.
5. Inflate the King with the appropriate volume:
 - If uninflated King Airway insertion is difficult, perform a jaw thrust, pulling the tongue forward. Alternately, a laryngoscope may be used to lift the jaw/mandible to facilitate insertion.
6. Attach the BVM to the King LTSD
7. While bagging the patient, gently withdraw the tube until ventilation becomes easy and free flowing (large tidal volume with minimal airway pressure)
8. Adjust cuff inflation if necessary to obtain a seal of the airway at the peak ventilatory pressure employed.
9. Obtain end-tidal CO₂ (waveform), listen for breath sounds bilaterally, look for chest excursion, and check oxygen saturation
10. Secure in the midline to help maintain a good seal over the Larynx
11. Place bite block, oral airway or endotracheal tube holder (if available) between teeth to prevent biting tube.
12. Ensure c-spine is still immobilized
13. If repeated attempts are made, oxygenate with 100% O₂ for 2 minutes between attempts
14. **Follow manufacturers suggested guidelines at all times**

*****ONCE KING LTD IS CONFIRMED IN CORRECT POSITION WITH GOOD BILATERAL BREATH SOUNDS AND ETCO₂ READING VIA BVM, CREW MAY CHOOSE TO VENTILATE PATIENT USING THE E700 AUTOMATIC TRANSPORT VENTILATOR IN A/CV (ASSIST CONTROL MODE). START WITH PRESET SETTING OF FIO₂ 100%, VT (TIDAL VOL.) 500 AND RATE OF 10. PARAMEDIC MAY ONLY ADJUST FIO₂, TIDAL VOLUME AND RATE IN A/CV MODE IF NEEDED. IF PATIENT DOES NOT TOLERAGE VENTILATOR, DISCONNECT, MANUALLY BAG AND REEVALUATE PATIENT.**

King LTD					
SIZE	2	2.5	3	4	5
Connector Color	Green	Orange	Yellow	Red	Purple
Pt. Criteria	35-45 inches or 12-25 kg	41-51 inches or 25-35 kg	4-5 feet	5-6 feet`	Greater than 6 feet
Cuff Volume	25-35 mL	30-40 mL	45-60 mL	60 -80 mL	70-90 mL

Procedure 7

Airway-Needle Cricothyrotomy

P PARAMEDIC P

Clinical Indications:

- Patients <12 years of age
- With obstructed airway or in whom all conventional methods of oxygenation have failed

Contraindications:

- Anytime a less invasive maneuver would allow oxygenation of the patient
- Tracheal transection

Notes/Precautions:

- Cricothyroid membrane is located by:
 - Palpating the protuberant midline portion of the thyroid cartilage ("Adams apple")
 - Move the fingertip inferiorly until it rests in the soft, flat depression between the thyroid cartilage and the cricoid cartilage
- In order to minimize the risk of dislodgement:
 - The individual completing the procedure should direct any/all patient movement
 - BVM is to be disconnected from the ET tube adapter any patient movement
 - The catheter is to be reassessed following any patient movement
- Appropriate size angiocath is generally 14-18 gauge, depending on size of the child

Procedure:

1. Position patient supine with head slightly extended unless contraindicated due to suspected cervical spine injury.
2. Prepare anterior surface of the neck with Chlorohexadine.
3. Locate the cricothyroid membrane.
4. Place thumb and index finger of non-dominant hand on either side of the tracheal cartilage to stabilize the trachea and anchor and stretch the skin slightly.
5. Connect appropriate sized angiocath to a 12 cc syringe.
6. Pierce the skin and cricothyroid membrane at a 45-degree angle, directing the catheter tip inferiorly while pulling suction on the syringe until air is aspirated freely.
7. Advance the catheter to the skin and withdraw needle.
8. Connect catheter to 3.0 mm pediatric ET tube adapter.
9. With a BVM attached to 100% oxygen begin ventilating and confirm proper placement.
10. With hub of catheter snug against the neck, tape catheter firmly in place.
 - Catheter and ET tube adapter are to be secured at all times by hand
 - Catheter should be secured with tape and benzoin to prevent slipping
11. Providers may continue to use backboards to assist

Airway-Orotracheal Intubation

Clinical Indications:

P	PARAMEDIC	P
---	-----------	---

- Respiratory or Cardiac Arrest
- Inadequate ventilation with Bag Valve Mask
- Impending respiratory failure:
 - Decreased level of consciousness with hypoxia unimproved by 100% oxygen, apnea, and/or respiratory rate <8
 - OR poor ventilatory effort (with hypoxia unresponsive to 100% Oxygen)
 - OR unable to maintain patent airway
- Airway obstruction

Equipment:

- Laryngoscope handle with appropriate size blade.
- Proper size endotracheal tube (ETT) plus back up ETT 0.5-1.0 mm smaller
- Water-soluble lubrication gel, (lubricate distal end of tube at cuff)
- 10cc syringe (larger syringe if low pressure cuff)
- Stylet, (insert into ET tube and do not let stylet extend beyond tip of ET tube)
- Tape or ETT securing device
- Proper size oral pharyngeal airway
- BVM
- Oxygen source
- Suction device
- Stethoscope
- Capnography
- Oxygen saturation monitor

Procedure:

Patient/equipment preparation:

- Maintain cervical alignment and immobilization, as necessary
- Attach proper blade to laryngoscope handle and check light
- Check endotracheal tube cuff
- Raise gurney so that patient's nose is at intubator's xiphoid (if possible)
- Confirm patient attached to cardiac monitor and oxygen saturation monitor
- Ready ETCO2 detection device
- Specify personnel to:
 - apply cricoid pressure
 - maintain cervical alignment and immobilization during procedure
 - watch cardiac and oxygen saturation monitors

Intubation:

- preoxygenate patient with 100% Oxygen (BVM or NRB) before intubation attempt to achieve O2 saturation >93% for 5 minutes or 8 vital capacity breaths. Have assistant apply cricoid pressure (Sellick's maneuver) during entire procedure.
- Remove all foreign objects, such as dentures, oral pharyngeal airways, etc. and suction the patient's airway if needed. (Do not remove an esophageal located ETT if in place from prior attempt)
- Grasp laryngoscope handle in left hand.
- Grasp ET tube in right hand

Airway-Orotracheal Intubation Cont.

- Insert the blade into the right side of the patient's mouth sweeping the tongue to the left side
- Visualize the vocal cords while avoiding any pressure on the teeth
- Insert the endotracheal tube until the cuff passes the vocal cords. (Insert far enough so that at balloon port tubing is even with lips)
- Typical depth = tube size (ID) x3 (example would be tube depth of 24 for a 8.0mm tube)
- Remove the laryngoscope blade
- Inflate the endotracheal cuff with the syringe with 5-10cc of air (low pressure cuff may require larger volume) and remove the syringe from inflation valve
- Confirm tube placement
- Ventilate with BVM and:
 - observe immediate (within 6 breaths) ETCO₂ waveform and number with capnography
 - watch for chest rise AND
 - listen to abdomen to ensure tube is not esophageal
- Then, listen for bilateral breath sounds
- Observe oxygen saturation

Note: regardless of the apparent presence of lung sounds, tube misting and chest rise, or lack of gastric sounds, if ETCO₂ does not indicate proper tube location (alveolar waveform), ETT must be removed.

- If unilateral right sided breath sounds are heard consider:
 - Right mainstem intubation
 - If present, deflate the cuff and withdraw tube 1-2cm
 - Repeat auscultation procedure as above for breath sounds
- If bowel sounds heard with bagging or ETCO₂ device does not indicate proper ETT placement, deflate cuff, remove tube and ventilate with BVM for two minutes
- If intubation attempt unsuccessful, refer to the next step in the Airway, Adult Protocol
- If successful tube placement:
 - Secure tube using an endotracheal securing device
 - Document depth of tube
 - Reassess lung sounds and patient clinical status
 - Insert oral pharyngeal airway, or use ET tube holder with built in bite block (if available)
 - Ensure c-spine is immobilized
 - Continue ventilations
 - Document ETCO₂ waveform and reading continuously at time of EACH patient movement, including waveform and reading at time of transfer of care at the emergency department.

*****ONCE ET TUBE IS CONFIRMED IN CORRECT POSITION WITH GOOD BILATERAL BREATH SOUNDS AND ETCO₂ READING VIA BVM, CREW MAY CHOOSE TO VENTILATE PATIENT USING THE E700 AUTOMATIC TRANSPORT VENTILATOR IN A/CV (ASSIST CONTROL MODE). START WITH PRESET SETTING OF FIO₂ 100%, VT (TIDAL VOL.) 500 AND RATE OF 10. PARAMEDIC MAY ONLY ADJUST FIO₂, TIDAL VOLUME AND RATE IN A/CV MODE IF NEEDED. IF PATIENT DOES NOT TOLERATE VENTILATOR, DISCONNECT, MANUALLY BAG AND REEVALUATE PATIENT. SIMV (SYNCHRONIZED INTERMITTENT MANDATORY VENTILATION) MODE MAY ALSO BE USED IF PREFERRED, BUT PARAMEDIC CANNOT ADJUST ANY SETTINGS IN SIMV MODE.*****

Airway-RSI (Rapid Sequence Intubation)



Indications

- GCS <8 (decreased LOC)
- Potential for airway compromise
- Head-injured patients with airway compromise
- Status epilepticus not responding to anticonvulsants
- Patients unable to protect airway (trauma, CVA, obstruction, overdose, anaphylaxis, etc.)
- Severe Respiratory Distress (COPD, asthma, burns, etc.)
- Insufficient respirations (pulse ox. <85%, shallow respirations, cyanosis, air hunger, etc.)
- Patients with a defined salvage airway plan (BVM, supraglottic airway, or surgical airway)

Contraindications

- Known allergy to necessary medications
- Suspected epiglottitis, edema, or retropharyngeal edema
- Severe oral, mandibular, or anterior neck trauma
- Conscious patient (with stable hemodynamics) who is maintaining an impaired airway
- Age less than 2 years old
- Cricothyrotomy contraindicated (potential contraindication)

PREPERATION (T-8 minutes)

- Monitoring (continuous EKG, SPO2, Blood Pressure)
- Patent IV/IO
- Functioning Laryngoscope and BVM with highflow O2
- Endotracheal tube(s), stylet, syringe(s)
- LTA(s) and appropriate syringe(s)
- Alternative/Rescue Airway and surgical airway kit immediately available
- All medications drawn up and labeled (including post-procedure sedation)
- Suction – turned on and functioning
- End Tidal CO2 device on
- Assess for difficult airway – LEMON

Continued on page 237

Airway-RSI (Rapid Sequence Intubation)

PREOXYGENATE

100% O₂ x5 minutes (NRB) or 8 vital capacity breaths with 100% O₂ (BVM/NRB)

PRETREATMENT (T-2 minutes)

- Evidence of head injury or stroke
- Lidocaine 1.5mg/kg IV/IO (max 150mg)
- All patients < age 12 – Atropine 0.02 mg/kg IV/IO (minimum 0.1 mg)

PARALYSIS and INDUCTION (T=0)

- Ketamine 1 mg/kg IV/IO over 1 minute. If Ketamine is contraindicated see box below in regards to Versed.
 - Versed 2.0 mg IV/IO may repeat 1x
- Succinylcholine 2 mg/kg

Use VERSED when Ketamine is relatively contraindicated. **Examples include:

- Severe Hypertension with cardiac history
- Known increased intracranial or intraocular pressure
- Pregnancy
- Consider the use of versed in a patient in status epilepticus
- Versed may be utilized for continued sedation

PLACEMENT with PROOF (T+30 seconds)

- Place LTA/ETT
- Confirm with:
 - End Tidal CO₂ Waveform
 - Auscultation
 - Physical findings
- Secure device, note position

POST-PLACEMENT MANAGEMENT (T+1 minute)

- Rocuronium 1mg/kg IV/IO
- Fentanyl 50 mcg IV/IO
- After 30 minutes re-sedate Versed 2mg IV/IO

*****ONCE ET TUBE IS CONFIRMED IN CORRECT POSITION WITH GOOD BILATERAL BREATH SOUNDS AND ETCO₂ READING VIA BVM, CREW MAY CHOOSE TO VENTILATE PATIENT USING THE E700 AUTOMATIC TRANSPORT VENTILATOR IN A/CV (ASSIST CONTROL MODE). START WITH PRESET SETTING OF FIO₂ 100%, VT (TIDAL VOL.) 500 AND RATE OF 10. PARAMEDIC MAY ONLY ADJUST FIO₂, TIDAL VOLUME AND RATE IN A/CV MODE IF NEEDED. IF PATIENT DOES NOT TOLERATE VENTILATOR, DISCONNECT, MANUALLY BAG AND REEVALUATE PATIENT. SIMV (SYNCHRONIZED INTERMITTENT MANDATORY VENTILATION) MODE MAY ALSO BE USED IF PREFERRED, BUT PARAMEDIC CANNOT ADJUST ANY SETTINGS IN SIMV MODE.*****

Airway-Suctioning: Advanced

P	PARAMEDIC	P
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Clinical Indications:

Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted with an airway adjunct such as a LTA/LMA, endotracheal tube, tracheostomy tube, or a cricothyrotomy tube.

Procedure:

1. Ensure suction device is in proper working order with suction tip in place
2. Preoxygenate the patient.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. For all devices, use the suprasternal notch as the end of the airway. 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 (ie. BVM) 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. Small volume (<10ml) of normal saline lavage may be used as needed.
9. Reattach ventilation device (ie. BVM) and ventilate or assist the patient.
10. Record the time and result of the suctioning procedure in the patient care report (PCR)

Airway-Suctioning: Basic

Clinical Indications:

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

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.
- 3) Explain the procedure to the patient if they are coherent.
- 4) Examine the oropharynx and remove any potential foreign bodies or material that may occlude the airway if dislodged by the suction device.
- 5) If applicable, remove ventilation devices (ie. BVM) from the airway.
- 6) Use the suction device to remove any secretions, blood, or other substances
The alert patient may assist with this procedure.
- 7) Reattach ventilation device (ie. BVM) and ventilate or assist the patient.
- 8) Record the time and result of the suctioning procedure in the patient care report (PCR)

Airway-Surgical Cricothyrotomy

P

PARAMEDIC

P

Clinical Indications:

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient > 12 years old.

Procedure:

1. Have suction and supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Prep the area with an antiseptic swab (Betadine).
4. Make a 1-inch vertical incision through the skin and subcutaneous tissue above and below the needle using a scalpel. Using blunt dissection technique, expose the cricothyroid membrane. This is a bloody procedure.
5. Make a horizontal stabbing incision approx. 1-inch through the membrane.
6. Using (skin hook, tracheal hook, or gloved finger) to maintain surgical opening, insert the cuffed tube into the trachea. (#6 endotracheal tube is usually sufficient).
7. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
8. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, end-tidal CO₂ detector, etc.) Esophageal bulb devices are not accurate with this procedure.
9. Secure the tube.
10. Apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.

Document ETT size, time, result (success), and placement location by the centimeter marks on/with the patient care report (PCR). Document all devices used to confirm initial tube placement and after each movement of the patient.

It is required that the airway be monitored continuously through waveform Capnography and Pulse Oximetry.

Airway-Video Laryngoscopy

Clinical Indications:

P	PARAMEDIC	P
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- Respiratory or Cardiac Arrest
- Inadequate ventilation with Bag Valve Mask
- Impending respiratory failure:
 - Decreased level of consciousness with hypoxia unimproved by 100% oxygen, apnea, and/or respiratory rate <8
 - OR poor ventilatory effort (with hypoxia unresponsive to 100% Oxygen)
 - OR unable to maintain patent airway
- Airway obstruction
- Rapid Sequence Intubation (RSI)

Equipment:

- Mc Grath ® Video Assisted Laryngoscope (VAL) with appropriate size blade.
- Proper size endotracheal tube (ETT) and back up ETT 0.5-1.0 mm smaller
- Water-soluble lubrication gel, (lubricate distal end of tube at cuff)
- 10cc syringe (larger syringe if low pressure cuff)
- Stylet if compatible with VAL device (insert into ET tube and do not let stylet extend beyond tip of ET tube)
- Tape or ETT securing device
- Proper size oral pharyngeal airway
- BVM
- Oxygen source
- Suction device
- Stethoscope
- Capnography
- Oxygen saturation monitor

Procedure:

Utilize Mc Grath ® Video Assisted Laryngoscope (VAL) with appropriate size blade as primary laryngoscope and have standard issued handle and blades for secondary/ backup. Follow Airway-Orotracheal Procedure.

Blood Glucose Analysis

Clinical Indications:

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Patients with suspected hypoglycemia (diabetic emergencies, altered/change in mental status, bizarre behavior, ect).

Procedure:

1. Gather and prepare equipment
2. Blood samples for performing blood glucose analysis should be obtained simultaneously with intravenous access when possible
3. Place correct amount of blood on test strip per manufacturer's instructions
4. Allow glucometer to analyze sample per manufacturer's instructions
5. Document the glucometer reading and treat the patient as indicated by the appropriate protocol
6. If reading appears incorrect, redraw and repeat analysis
7. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.

Carboxyhemoglobin SPCO Monitoring

Clinical Indications:

Persons with suspected or known exposure to carbon monoxide

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Procedure:

1. Apply probe to patient's middle finger or any other digit as recommended by the manufacturer. If near strobe lights, cover the finger to avoid interference and/or move away from lights if possible.
 2. Where the manufacturer provides a light shield it should be used.
 3. Allow machine to register percent circulating carboxyhemoglobin values
 4. Verify pulse rate on machine with actual palpable pulse of the patient.
 5. Record levels in patient care report or on the scene rehabilitation form.
 - If CO <5%, assess for other possible illness or injury
 - If CO >5% to <15% and symptomatic from Carbon Monoxide – treat per Carbon Monoxide Exposure Protocol
- Signs and Symptoms - Altered mental status / dizziness, headache, nausea/vomiting, chest pain/respiratory distress, neurological impairments, vision problems/reddened eyes, tachycardia/tachypnea, arrhythmias, seizures, coma**
- If CO >15% = Treat per Overdose and Poisoning: Carbon Monoxide Protocol and Transport.
6. Monitor critical patients continuously with pulse ox, SpCO and ETCO₂ until arrival at the hospital.
 7. Document percent of carboxyhemoglobin values every time vital signs are recorded during therapy for exposed patients.
 8. Use the pulse oximetry feature of the device as an added tool for patient evaluation. Treat the patient, not the data provided by the device. Utilize the relevant protocol for guidance.
 9. The pulse oximeter reading should never be used to withhold Oxygen from a patient in respiratory distress
 10. Factors which may reduce the reliability of the reading include:
 - Poor peripheral circulation (blood volume, hypotension, hypothermia)
 - Excessive external lighting, particularly strobe/flashing lights
 - Excessive sensor motion
 - Fingernail polish (may be removed with acetone pad)
 - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
 - Jaundice
 - Placement of BP cuff on same extremity as pulse ox probe

Cardioversion

P	PARAMEDIC	P
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Clinical Indications:

- Unstable patient with tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (pulseless patient requires unsynchronized cardioversion, ie. 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 medication or sedatives per protocol.
- 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 be 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. Follow the procedure for Defibrillation-Manual
- 9) If the patient's condition is unchanged, repeat steps 2-8 above, using escalating energy settings per protocol.
- 10) Repeat per protocol until maximum setting or until efforts succeed.
- 11) Note procedure, response, and times in the PCR.

Cardio Cerebral Resuscitation

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

- Age > 18 years of age (CCR causes worse outcomes in the pediatric population)
- Suspected cardiac cause of arrest (not respiratory-OD, drowning, etc.)

It occurs with Ventricular Fibrillation or Pulseless Ventricular Tachycardia, with PEA and with Asystole. You must assume there is no blood perfusing the brain and heart....which is bad for survival. Your patient needs both a pump (chest compressions) and diastolic pressure support (to perfuse the coronary arteries). Time spent doing other things (such as prolonged airway management) at the expense of not delivering pump support is not good for the patient. Determine as close as possible when the patient collapsed, and document this. Also look for any signs of patient gasping prior to and/or during resuscitation, and document this. If gasping is present, note pupil reaction and document also. It is also important to remember that not all Pulseless patients are the result of cardiac related events. Other mechanisms such as trauma, drowning, hypothermia, choking and other respiratory problems, etc. must be considered as a possible cause for the arrest and should be addressed with immediate, appropriate airway intervention.

Key points in the Cardio Cerebral Resuscitation (CCR) approach:

- Survival is determined by a functional recovery of two organs: the heart and the brain
 - Without adequate blood flow neither organ will survive.
 - that makes properly performed chest compressions (CC) the single most important determinant of survival.
 - Anything that interrupts or otherwise decreases the quality of CC contributes to the death of your patient.
 - This concept – continuous maximal quality CC – must become the foundation of all you think and do during resuscitation.
 - All patients are treated the same during the first two minutes of the code.
 - They get uninterrupted continuous CC (CCC) while other interventions are performed.
 - The cardiac rhythm is irrelevant during this period.
- The cardiac rhythm determines subsequent management.
 - It is analyzed (using manual interpretation) briefly AFTER each set of 200 CCC
 - It is either shockable or non-shockable - don't make it more complicated than that.
- CCCs are to be resumed immediately following a rhythm assessment + shock.
 - The rhythm observed after a shock is not – meaning NOT – to be treated.
 - Otherwise deadly pauses in CCC will be introduced in an attempt to gather information that is irrelevant to survival!
- The initial rhythm (after 200 CCC) determines subsequent treatments:
 - When to initiate invasive airway insertion and positive pressure ventilation.
 - Need for anti-arrhythmic medications
 - How long to remain on scene.
- Success depends on:
 - Leadership
 - Delegation of a limited set of specific tasks
 - Timely focused completion of these specific tasks by rescuers

Continued on page 246

Cardio Cerebral Resuscitation Cont.

- Interventions that are critical to survival **MUST** whenever possible be performed by two persons solely dedicated to that task.
 - One to perform it and a second person to assure quality performance.
 - This applies especially to chest compressions and it is also important in the management of an invasive airway + ventilations.

Code Commander:

- Someone must assume the role of code commander. This person is responsible for delegating tasks, is the only person interpreting the rhythm, and is responsible for monitoring/critiquing the overall performance of the team.
- Other members must work as a team and take direction from the code commander. They must focus on their assigned tasks and let the code commander manage the overall response (in other words, keep their noses out of other rescuers business)

Critical First Tasks: (delegated and performed in first two minutes if at all possible)

- **MCMAID – a prioritized sequence consisting of:**
 - **M** = Metronome (100/min)
 - **C** = Chest compressions (focus on rate, recoil and depth)
 - **M** = Monitor (turn on in defib mode, pads on, joules set at maximum)
 - **A** = Airway (OPA, ensure patency, NRB @ 15/lpm)
 - **I** = Intravenous or Intraosseous access
 - **D** = Drugs (Epi, Amiodarone) (be ready to administer when needed and monitor timing for repeat doses)

Chest Compressions: MCMAID

- Metronome should be turned on to assure a rate of 100/minute.
- CCC should be started ASAP after arrival.
- A two-person task if at all possible
 - Switch compressors rapidly/frequently (every 1-2 minutes)
 - The non-compressor continuously monitors the quality of CCC: rate, depth and recoil
- CCC should be continuous = not interrupted
 - The only valid reasons for interrupting compressions are for analyzing the rhythm and shocking.
 - All other requests to pause CCC must be cleared by the code commander, and the reason and duration documented in the run report.

Monitor/Defibrillator: MCMAID

- Initial:
 - Turn unit on when compressions are started and set mode to defib.
 - Ensure joules are set to maximum allowed
 - Place pads in sternum/apex position without interruption of chest compressions.
- Defibrillation Process:
 - Charge defibrillator during the last 10 seconds of 200 CCC.
 - Ensure all rescuers will be clear if a shock is needed.

Continued on page 247

Cardio Cerebral Resuscitation Cont.

- Pause a few seconds only for analysis – determine if it is shockable or not.
 - If indicated, immediately deliver a single (not stacked) shock at maximum joules.
 - If no shock is indicated, dump the charge by either decreasing the energy level and immediately returning back to maximum energy setting (200J or 360J), OR switching the mode to monitor and then quickly back to defib mode.
- Immediately resume CCC after analysis + shock.
 - The pause from stopping CCC to resumption of CCC should be less than 5 seconds.

Airway: MCMAID

- Initially:
 - Insert OPA, apply NRB @15 lpm (look for misting), ensure patency (listen for exhausted air with compressions. If unsure, give one single breath with BVM, looking for chest rise and fall for compliance).
- When to insert invasive airway depends on the initial rhythm:
 - If non-shockable, initiate immediately after first rhythm analysis.
 - If shockable – ONLY after three cycles (2 min. of CCC + analysis + shock). NOT earlier, even if second rhythm is non-shockable.
- Once the invasive airway is in place, the airway persons sole task is to perform/monitor that task and no other.
- Invasive airway monitoring includes attention to:
 - Proper placement
 - Apply Capnography and verify waveform/presence of ETCO₂.
 - Avoidance of any interruption of CCC
 - Ventilation rate of 6 per minute. Each breath must be timed – aim for 10 seconds between each breath. Excessive ventilation rates are deadly!
 - Volume should be ~500cc.
 - Delivery of breath should be over one second.
- Use an LTA if placing an endotracheal tube is met with any problems or delays.
- If the initial rhythm is shockable, seriously consider using the LTA instead of an ETT because these patient's cannot tolerate even brief periods of less than optimal CCC.
- Assure that oxygen is attached.

*****THE E700 AUTOMATIC TRANSPORT VENTILATOR MAY BE USED IN CPR MODE IN INTUBATED OR MASK VENTILATED MODE. IN MASK VENTILATED MODE THE VENTILATOR CONSISTS OF TIMED CHEST COMPRESSION AUDIBLE PROMPTS AT A RATE OF 30:2. PLEASE ENSURE A TIGHT MASK SEAL AND USE A HEAD TILT CHIN LIFT WHEN VENT IS ADMINISTERING VENTILATIONS. IN ET INTUBATED MODE TIMED CHEST COMPRESSION AUDIBLE PROMPTS WILL CONTINUE WITHOUT INTERRUPTION AND AUTOMATICALLY VENTILATE AT A RATE OF 10 BPM. PARAMEDIC MAY ALSO OPT TO USE VENTILATOR IN A/CV MORE IN INTUBATED PATIENTS ONLY IF AUDIBLE COMPRESSION PROMPTS ARE NOT DESIRED. PARAMEDIC MAY ONLY ADJUST FIO₂, TIDAL VOLUME AND RATE IN A/CV MODE IF NEEDED.*****

Continued on page 248

Procedure 18

Cardio Cerebral Resuscitation Cont.

Intravenous/Intraosseous access: MCMAID

- Consider intraosseous route whenever there are any delays in IV insertion.
- Consider spiking a bag en route and having it ready on arrival.

Drugs: MCMAID

- The individual assigned to the Drug “Task”:
 - Initially ensures medications are available and ready to administer.
 - Is responsible for:
 - The rapid administration when indicated.
 - Re-dosing at appropriate intervals.
 - Detecting when V-Fib is persistent or recurrent, and therefore indicating the use of Amiodarone.
 - Accurate timing of when meds are to be given (to the second – using elapsed time since defibrillator was turned on.)
- Vasopressors should be given ASAP after analysis + shock, so their effect will be seen after the next 200 chest compressions.
- **Epinephrine first!**
 - **The one exception is the patient who you suspect may get return of spontaneous circulation with the first shock. Such patients may include those with short down times or those who have had excellent chest compression generated perfusion. A clue to this is the presence of regular agonal respirations (gasping).
 - Epi dose is 1mg IV/IO. Endotracheal administration is not to be utilized – start an IO instead
 - If repeating doses, administer every other cycle of 200 compressions. (equivalent to every 4 min)
- **Amiodarone** is administered for persistent or recurrent pulseless V-fib/Tach. This should be administered immediately during the next 200 chest compression cycle if a second shock was indicated and delivered at the time of analysis. The Code Commander may visualize return of fibrillation during the 200 CCC and as such may order Amiodarone earlier since it has recurred.
 - Dose is 300mg IV/IO
 - Repeat doses are 150mg IV/IO
- **Additional Treatments to consider:**
 - Consider possible renal failure (hyperkalemia) or suspected Tricyclic antidepressant overdose. If suspected, administer **Sodium Bicarbonate** 1mEq/Kg. If renal failure is suspected, also administer **Calcium Chloride** 1g IVP.
 - If rhythm is persistent shockable V-fib or Pulseless V-Tach, consider the possible use of **Magnesium Sulfate** 2g IVP.

Continued on page 249

Procedure 18

Cardio Cerebral Resuscitation Cont.

- **Additional Treatments to consider (continued):**

- If the patient is successfully converted from V-Fib/Pulseless V-tach to a perfusing sustainable rhythm, consider post resuscitation Amiodarone boluses.
 - **Amiodarone bolus: 150mg**
- If rhythm is a non-shockable Asystole or PEA, seek out and treat any possible contributing factors.

When to stop CCC:

- If the patient shows signs of cerebral activity and the rhythm is non-shockable.
- Use end-tidal CO₂ as a marker for possible ROSC. Look for a dramatic increase.
- Pulse checks are **ONLY** performed during brief rhythm analysis with location of carotid pulse ascertained during chest compressions.
 - This may be modified by the Code Commander if cerebral function signs of life appear
 - The Code Commander is the only individual who can order a pulse check other than that done during rhythm analysis.
 - The Code Commander must ensure the pulse checker is clear if a shock is indicated.

When to move the patient:

- Remember that moving the patient inevitably results in compromised quality of compressions. If crew safety is compromised or inadequate resuscitation space is available, patient should be quickly moved to a safe or larger area. This should be done initially and not after resuscitation efforts have begun.
- Initially shockable patients will live or die in the field!
 - Move is allowed after 3 cycles are completed and a non-shockable rhythm is identified at the 3rd analysis
 - If 3rd analysis is still shockable, continue resuscitation at the scene until a non-shockable rhythm is encountered.
- Initially non-shockable rhythms
 - Medical Control must make this determination, but these patients may deserve at least 3 cycles of treatment with optimal quality compressions.

Avoid Excessive Pauses:

- Rhythm analysis – **ONLY** the Code Commander pays attention to the rhythm (not everyone)
- Resume CCC immediately after analysis + shock. The Code Commander must assure this happens
- Charging – perform during last 10 seconds of 200 chest compressions
- During Intubation – It is responsibility of both the Code Commander and the second airway person to avoid pauses in CCC. This **MUST** be able to be performed without any interruption of compressions! Consider using the LTA if unable to intubate effectively.
- Pulse Checks – only performed during the rhythm analysis pause; must be correlated with rhythm

Chest Decompression

P PARAMEDIC P

Clinical Indications:

Tension pneumothorax should be suspected in patients who exhibit:

- Severe respiratory distress with hypoxia
- Unilateral decreased or absent lung sounds
- Evidence of hemodynamic compromise (Shock, Hypotension, Tachycardia, Altered Mental Status)
- Tracheal deviation away from the collapsed lung field (less reliable than the above)

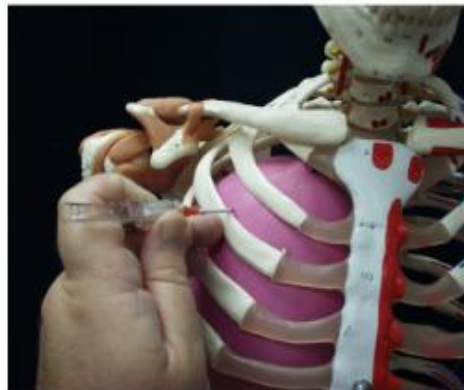
Pleural decompression for tension pneumothorax should only be performed when at least 3 of the above criteria are present.

Equipment:

- 14 gauge 2 inch – 2.5 inch over the needle catheter
- Tape
- Sterile gauze pads
- Antiseptic swabs
- Occlusive dressing

Procedure:

- Locate decompression site
 - Identify the 2nd intercostal space in the mid-clavicular line on the same side as the pneumothorax
- Prepare the site with an antiseptic swab:
 - Firmly introduce catheter immediately above distal rib of selected site.
- Insert the catheter into the thorax until air exits
- Advance catheter and remove needle.
- Secure the catheter taking care not to allow it to kink
- Reassess lung sounds and patient condition
- Dress area with occlusive dressing then cover with sterile gauze pad
- Assess breath sounds and respiratory status.



Procedure 19

Childbirth

Clinical Indications:

Active labor with perineal crowning

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

- Apply personal protective equipment and prepare for childbirth
- Allow head to deliver passively and control delivery by placing palm of hand over occiput.
- Protect perineum with pressure from other hand
- If amniotic sac is still intact, gently pinch and twist to manually rupture.
- Note presence or absence of meconium.
- If meconium is present, see Complication of Childbirth
- Once the head is delivered and passively turns to one side, suction mouth and nose
- If nuchal cord present, gently lift cord from around infant's neck
- Gently apply downward pressure to infant to facilitate delivery of upper shoulder
- Once upper shoulder has delivered, apply gentle upward pressure to deliver lower shoulder
- Grasp the infant as it emerges from birth canal
- Keep infant at level of perineum until cord stops pulsating and cord is clamped.

Care of the Newborn:

- Double clamp cord 10-12 inches from abdomen, once it stops pulsating cut cord.
- Suction mouth and nose
- Dry and warm the neonate. Wrap in blankets
- Stimulate infant by rubbing back or soles of feet
- Refer to Neonatal Resuscitation Protocol if infant is hypoxic, not breathing properly or heart rate <100.

Obtain APGAR Score:

Sign	0	1	2
Appearance	Blue, Pale	Extremities Blue	Pink Throughout
Pulse	0	<100/ minute	>100/ minute
Grimace	None	Movement	Cry
Activity	Limp	Some Flexion	Active Flexion
Respirations	0	Weak Cry	Strong Cry

Post Partum Care:

- Allow placenta to deliver spontaneously while transporting patient to hospital. Do not pull on cord.
- Apply direct pressure to any actively bleeding areas on the perineum
- If blood loss significant or vaginal bleeding continues
 - Fluid bolus as needed
 - Massage top of uterus
 - Allow newborn to nurse / breast feed if stable

Procedure 20

Childbirth Complications

Shoulder Dystocia:

- Place mother in knee-chest position and reattempt delivery
- If delivery fails, support child's airway, provide supplemental oxygen.

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Breech Birth:

- Do not attempt to pull infant by trunk or legs.
- Place mother in knee-chest position
- If head does not deliver, push baby's mouth and nose away from vaginal wall with two gloved fingers.
- Provide supplemental oxygen to infant.

Prolapsed Cord:

- Place mother in knee-chest position
- Do not push cord back into birth canal
- Insert gloved fingers into birth canal and keep pressure off prolapsed cord
- Cover exposed cord with warm moist dressing

Meconium-Stained Amniotic Fluid:

- Suction mouth and nose after delivery
- If baby is vigorous (normal respiratory effort, muscle tone, and heart rate >100), provide supportive care

P PARAMEDIC P

Meconium-Stained Amniotic Fluid:

- *Suction mouth and nose after delivery*
- *If baby is vigorous (normal respiratory effort, muscle tone, and heart rate >100), provide supportive care*
- *If baby is not vigorous (depressed respirations, poor muscle tone, or heart rate <100), perform endotracheal intubation and suction trachea while removing ET tube with meconium aspirator attachment, may repeat one additional time.*
- *Support ventilation and re-intubate with a clean tube*

Procedure 21

CPR-Cardiopulmonary Resuscitation

Clinical Indications:

- Pediatric Arrest
- Suspected non-cardiac arrest/respiratory arrest in adult patients (ie. overdose, drowning)

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Procedure:

- 1) Assess the patient's level of responsiveness (signs of life)
- 2) If no response, open the patient's airway with the head-tilt, chin-lift. 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) If patient is an adult, go to step 4. If no respiratory effort in the pediatric patient, give two ventilations. If air moves successfully, go to step 4. If air movement fails, proceed per AHA obstructed airway guidelines.
- 4) Check for pulse (carotid for adults and older children, brachial or femoral for infants) for at least 10 seconds. If no pulse, begin chest compressions as directed below.

Age	Location	Depth	Rate
Infant	Over sternum, (between inter-mammary line), 2-3 fingers	1.5 inches (1/3 the anterior-posterior chest dimension)	At least 100/minute
Child	Over sternum, between nipples, heel of one (1) hand	2 inches (1/3 the anterior-posterior chest dimension)	At least 100/minute
Adult	Over sternum, just above the xyphoid process, hands with interlocked fingers	At least 2 inches (1/3 the anterior-posterior chest dimension)	At least 100/minute

- 5) Go to Cardiac Arrest protocol
- 6) Chest compressions should be provided in an uninterrupted manner. Only brief interruptions are allowed for rhythm analysis and defibrillation
- 7) Document the time and procedure in the PCR.

*****THE E700 AUTOMATIC TRANSPORT VENTILATOR MAY BE USED IN CPR MODE IN INTUBATED OR MASK VENTILATED MODE. IN MASK VENTILATED MODE THE VENTILATOR CONSISTS OF TIMED CHEST COMPRESSION AUDIBLE PROMPTS AT A RATE OF 30:2. PLEASE ENSURE A TIGHT MASK SEAL AND USE A HEAD TILT CHIN LIFT WHEN VENT IS ADMINISTERING VENTILATIONS. IN ET INTUBATED MODE TIMED CHEST COMPRESSION AUDIBLE PROMPTS WILL CONTINUE WITHOUT INTERRUPTION AND AUTOMATICALLY VENTILATE AT A RATE OF 10 BPM. PARAMEDIC MAY ALSO OPT TO USE VENTILATOR IN A/CV MODE IN INTUBATED PATIENTS ONLY IF AUDIBLE COMPRESSION PROMPTS ARE NOT DESIRED. PARAMEDIC MAY ONLY ADJUST FIO2, TIDAL VOLUME AND RATE IN A/CV MODE IF NEEDED.*****

Procedure 22

Defibrillation-Automated

Clinical Indications:

- Patients in cardiac arrest (pulseless, non-breathing)
- Age <8 years, use pediatric pads if available

Contraindications:

Pediatric patients whose body size is such that the pads cannot be placed without touching one another.

Procedure:

- 1) If multiple rescuers available, one rescuer should provide uninterrupted chest compression while the AED is being prepared for use.
- 2) Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICD's) occupy preferred pad positions.
- 3) Remove any medication patches on the chest and wipe off any residue
- 4) If necessary, connect defibrillator leads: per manufacturer recommendations.
- 5) Activate AED for analysis of rhythm
- 6) Stop chest compressions and clear the patient for rhythm analysis. Keep interruption in chest compressions 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/CCR immediately after the delivery of the shock beginning with chest compressions.
- 9) After 2 minutes of CPR/CCR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
- 10) If "no shock advised" appears, perform CPR/CCR for two minutes and then reanalyze.
- 11) Transport and continue treatment as indicated.
- 12) Keep interruption of compressions as brief as possible. Adequate CPR/CCR is a key to successful resuscitation.

If pulse returns: See Post-Resuscitation Protocol

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Defibrillation-Manual

P

PARAMEDIC

P

Clinical Indications:

Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

Procedure:

- 1) Ensure chest compressions are adequate and interrupted only when necessary
- 2) Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation
- 3) Apply hands-free pads to the patient's chest in the proper position
- 4) Charge the defibrillator to the maximum energy level. Continue chest compressions while the defibrillator is charging.
- 5) Pause compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.
- 6) Deliver the shock by depressing the shock button for hands-free operation.
- 7) Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR/CCR, analyze rhythm and check for pulse only if organized rhythm.
- 8) Repeat the procedure every two minutes as indicated by patient response and EKG rhythm.
- 9) Keep interruption of compressions as brief as possible. Adequate compressions are the key to successful resuscitation.

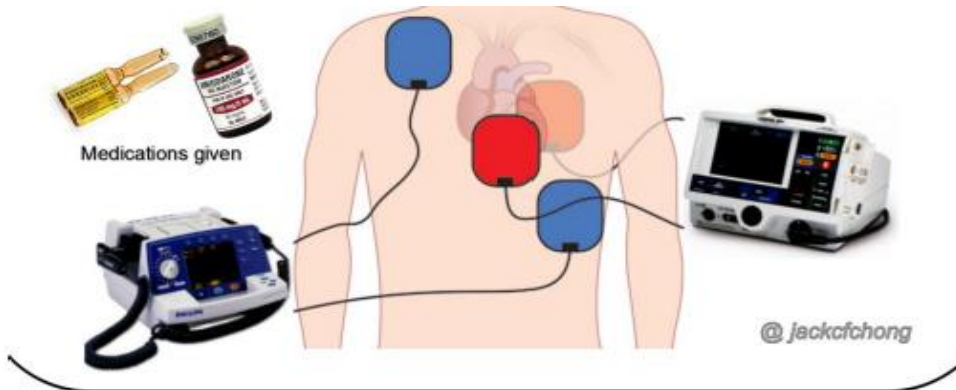
If pulse returns: See Post-Resuscitation Protocol

Defibrillation – Double Sequential

Clinical Indications:

P PARAMEDIC P

Any patient who has persisted in ventricular fibrillation/tachycardia, without even transient interruption of fibrillation, as per the persistent VF/VT protocol. Refractory ventricular fibrillation or pulseless ventricular tachycardia where ≥ 3 shocks delivered. At least one shock was delivered using different pads applied so as to produce a different current vector than the first set.



Procedure:

3. Ensure ongoing high quality CPR that is interrupted only when absolutely necessary.
 - Consider alternate pad placement prior to Dual or Double Defibrillation
 - Maximize pressure on pads with hands when defibrillating.
4. Prepare sites for second pad set attachment and apply defibrillation pads.
 - Pads: First defibrillator pads preferred in AP position, with anterior pad just to patient's left of sternum (red pads in diagram)
 - Pads: Second defibrillator pads in AL position, with anterior pad to patient's right of sternum and lateral pad at the patients left anterior axillary line (blue pads in diagram)
 - Ensure pads are not in contact with one another. For patients with implanted pacers/defibrillators: Avoid placing paddles or pads directly above device.
5. Set the appropriate energy level and assure controls for both defibrillator/monitors are accessible to provider performing defibrillation.
6. Follow procedure outlined in the VF/VT protocol. If refractory or persistent VF/VT continues:
*Charge the defibrillators to the selected energy level; Continue chest compressions while the defibrillator is charging.
7. When both monitor/defibrillators have reached selected energy setting: *Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient. Push both defibrillator shock buttons simultaneously.
*****ONE PERSON SHOULD BE PUSHING BOTH SHOCK BUTTONS SEQUENTIALLY*****
8. 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.
9. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm, as per VF/VT protocol.
10. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

External Cardiac Pacing

P PARAMEDIC P

Clinical Indications:

- Monitored heart rate less than 60 per minute with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
 - Severe chest pain
 - Hypotension
 - Pulmonary edema
 - ALOC, disorientation, confusion, etc
- 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 left mid posterior back next to spine
- 3) Set pacing option to 50 mA
- 4) Adjust heart rate to 100 BPM for an adult, 100 BPM for pediatric patients
- 5) Note pacer spikes on EKG screen
- 6) Slowly increase output of 10 mA 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) Mechanical capture occurs when paced electrical spikes on the monitor correspond with palpable pulse
- 10) Consider the use of sedation and analgesia if patient is uncomfortable, per protocol
- 11) Document the dysrhythmia and the response to external pacing with EKG strips in the PCR.

Injectons-Subcutaneous and Intramuscular

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	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).

MAD-Mucosal Atomizer Device

Purpose:

Administration of medication via a non-invasive route

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

- Altered mental status, presumed or possible opiate overdose
- Seizures
- Pain management

Contraindications:

DO NOT USE on patient if:

- Severe nasal/facial trauma
- Active nasal bleeding or discharge

Procedure for medication administration via the MAD®:

- 1) Determine appropriate dose of medication per protocol
- 2) Draw medication into syringe and dispose of the sharps (add an additional 0.1 ml of medication due to dead space), do not administer more than 1 ml per nostril.
- 3) Attach Mucosal Atomizer Device (MAD) to syringe
- 4) With one hand, control the patient's head
- 5) Gently introduce MAD into nare, stop when resistance is met.
- 6) Aim slightly upwards and toward the ear on the same side.
- 7) Briskly compress the syringe to administer one-half of the medication, repeat the procedure with the remaining medication on the other nare.
- 8) Document the results in the PCR.

Pulse Oximetry

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

Patients with suspected hypoxemia, altered level of consciousness respiratory issues, or as specified in protocol.

Procedure:

- 1) Apply probe to patient's finger, toe or ear or 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 PCR
- 4) Verify pulse rate on machine or with actual manual pulse check 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 93% 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.
- 10) Factors which may reduce the reliability of the pulse oximetry reading include:
 - 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

Spinal Protection (Backboard Reduction)

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Indications:

Long spine boards (LSB) have both risks and benefits for patients and have not been shown to improve outcomes. The best use of the LSB may be for extricating the unconscious patient, or providing a firm surface for compressions. However, several devices may be appropriate for patient extrication and movement, including the scoop stretcher and soft body splints. Utilization of the LSB should occur in consideration of the individual patient's benefit vs. risk.

Whether or not a LSB is utilized, spinal precautions are **STILL VERY IMPORTANT** in patients at risk for spinal injury. Adequate spinal precautions may be achieved by placement of a hard cervical collar and ensuring that the patient is secured tightly to the stretcher, ensuring minimal movement and patient transfers, and manual in-line stabilization during any transfers.

Procedure:

- In a patient with a potential spinal injury, if the following elements can be confirmed, cervical spinal immobilization is **NOT** indicated.
 - The patient is > 5 and < 65 years old.
 - The patient is conscious, alert, and able to fully cooperate with examination.
 - The patient is not intoxicated. (No alcohol, drugs, etc.)
 - The patient does not have a distracting injury.
 - The patient has no neurologic deficits. (Transient or sustained.)
 - The patient has no midline spinal tenderness, deformity, or pain with ranging.
 - There is no other reason to suspect a cervical spinal injury.
- Mechanisms suggestive of a potential spinal injury include, but are not limited to:
 - Fall from any height with evidence of striking head.
 - Fall from a height > 2X patient's height.
 - Blunt trauma.
 - MVC with > 30mph velocity differential.
 - Any trauma where patient was thrown (Auto vs. pedestrian, explosion, etc.)
 - Lightning or high voltage electrical injury.
 - Axial loading injury (Swimming, diving, etc.)
- Distracting injury:
 - Any pain sufficient to interfere with the patient's ability to cooperate with assessment, including both medical and traumatic etiologies.

WHEN IN DOUBT ALWAYS IMMOBILIZE!!

Spinal Immobilization-Football Players

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

EMS providers must use extreme caution when evaluating and treating an injured football player, especially when the extent of the injury remains unknown. Suspect any unconscious football player to have an accompanying spinal injury until proven otherwise. If the football player isn't breathing or the possibility of respiratory arrest exists, it's essential that certified athletic trainers and EMS providers work quickly and effectively to remove the face mask and administer care. In most situations, the helmet **should not** be removed in the field. Proper management of head and neck injuries includes leaving the helmet and shoulder pads in place whenever possible, removing only the face mask from the helmet and developing a plan to manage head-and-neck injured football players using well-trained sports medicine and EMS providers.

Guidelines and Recommendations:

The following guidelines and recommendations were developed by the Inter-Association Task Force for the Appropriate Care of the Spine-Injured Athlete:

- General Guidelines for Care Prior to Arrival of EMS
 - The Emergency Medical Services system should be activated.
 - Any athlete suspected of having a spinal injury should not be moved and should be managed as though a spinal injury exists.
 - The athlete's airway, breathing and circulation, neurological status and level of consciousness should be assessed.
 - The athlete should NOT be moved unless absolutely essential to maintain airway, breathing and circulation
 - If the athlete must be moved to maintain airway, breathing and circulation, the athlete should be placed in a supine position while maintaining spinal immobilization
 - When moving a suspected spine injured athlete, the head and trunk should be moved as a unit. one accepted technique is to manually splint the head to the trunk.
- Face Mask Removal
 - The face mask should be removed prior to transportation, regardless of current respiratory status (see figure 1)



- Those involved in the pre-hospital care of injured football players must have the tools for face mask removal readily available.

Procedure 31

Spinal Immobilization-Football Players Cont.

Indications for Football Helmet Removal:

- The athletic helmet and chin straps should only be removed if:
 - The helmet and chin strap do not hold the head securely, such that immobilization of the helmet does not also immobilize the head
 - The design of the helmet and chin strap is such that even after removal of the face mask the airway cannot be controlled, or ventilation be provided.
 - The face mask cannot be removed after a reasonable period of time
 - The helmet prevents immobilization for transportation in an appropriate position.

Helmet Removal:

- If it becomes absolutely necessary, spinal immobilization must be maintained while removing the helmet.
 - Helmet removal should be frequently practiced under proper supervision by an EMS supervisor or Training Division.
 - Due to the varying types of helmets encountered, the helmet should be removed with close oversight by the team athletic trainers and/or sports medicine staff
 - In most circumstances, it may be helpful to remove cheek padding and/or deflate air padding prior to helmet removal.

Spinal Alignment:

- Appropriate spinal alignment must be maintained during care and transport using backboard, straps, tape, head blocks or other necessary equipment.
 - Be aware that the helmet and shoulder pads elevate an athlete's trunk when in the supine position
 - Should either be removed, or if only one is present, appropriate spinal alignment must be maintained.
 - The front of the shoulder pads can be opened to allow access for CPR and defibrillation.

Splinting

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

Immobilization of an extremity for transport, either due to suspected fracture, sprain or injury.

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 (ie. 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, reposition the splint and reassess. If no improvement, remove splint.
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, place a traction splint
8. Consider pain management per protocol
9. Document the time, type of splint, and the pre and post assessment of pulse, sensation and motor function in the PCR.

Stroke Screen

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

Suspected stroke patient.

Procedure:

- 1) Assess and treat suspected stroke patients as per protocol
- 2) The LA Stroke Screen should be completed for all suspected stroke patients
- 3) Establish the “time last normal” for the patient. This will be the presumed time of onset.
- 4) Perform the screen through physical exam:
 - Look for facial droop by asking the patient to smile
 - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes, and turn their palms upward. Assess for unilateral drift of an arm.
 - Have the person say, "You can't teach an old dog new tricks," or some other simple, familiar saying. Assess for the person to slur the words, get some words wrong, or inability to speak.
- 5) One of these exam components must be positive to answer “yes”
- 6) Evaluate Blood Glucose level results
- 7) If the “time last normal” is less than 24 hours, blood glucose is between 60 and 400, and at least one of the physical exam elements is positive, follow the Suspected Stroke Protocol, alerting the receiving hospital of a possible stroke patient as early as possible and to initiate CODE STROKE.
- 8) All sections of the LA screen must be completed.
- 9) The complete screening should be documented in the PCR.

Temperature Measurement

B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation.

Procedure:

- 1) If clinically appropriate, allow the patient to reach equilibrium with the surrounding environment.
- 2) Leave the device in place until there is indication of an accurate temperature acquisition (per the “beep” or other indicator specific to the device)
- 3) Record time, temperature, method (tympanic, rectal or oral), and scale (C° or F°) in PCR

Tourniquet

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

- Life threatening extremity hemorrhage that cannot 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
7. If one tourniquet is not sufficient or not functional to control hemorrhage, consider the application of a second tourniquet more proximal to the first.

Venous Access-External Jugular

P

PARAMEDIC

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. Consider IO access in addition to or instead of an EJ attempt.

External jugular cannulation may 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. Compressing 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).



Procedure 36

Venous Access-Extremity

Clinical Indications:

- Patients requiring IV medications or fluids
- Patients with any potential for deterioration (ie. seizures, altered mentation, trauma, chest pain, difficulty breathing)

AE	A-EMT	AE
P	PARAMEDIC	P

Contraindications:

Child with partial airway obstruction (ie. Suspected epiglottitis) – when agitation from performing procedure may worsen respiratory difficulty.

Equipment:

- Appropriate tubing or IV lock
- #16-#24 catheter over the needle, or butterfly needle
- Venous tourniquet
- Antiseptic swab
- Gauze pad or adhesive bandage
- Tape or other securing device

Procedure:

- 1) Saline locks may be used as an alternative to IV tubing and fluid at the discretion of the paramedic
- 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:
 - Normal Saline with a macro drip (10-gtt/cc) for medical/trauma conditions.
 - Normal Saline with a micro drip (60gtt/cc) for medication infusions or for patients where fluid overload is of concern.
- 5) Assemble IV solution and tubing:
 - Open IV bag and check for clarity, expiration date, etc.
 - Verify correct solution
 - Open IV tubing
 - Assemble IV tubing according to manufacturer's guidelines

Continued on page 270

Venous Access-Extremity Cont.

6) Insertion

- Explain to the patient that an IV is going to be started.
- Place the tourniquet around the patient's arm proximal to the IV site, if appropriate
- Palpate veins for resilience
- Clean the skin with the antiseptic swab in an increasing sized concentric circle and follow it with an alcohol swab
- Stabilize the vein distally with the thumb/fingers
- Enter the skin with the bevel of the needle facing upward
- Enter the vein, obtain a flash, and advance the catheter into the vein while stabilizing the needle.
- Remove the needle while compressing the proximal tip of the catheter to minimize blood loss
- Remove the tourniquet
- Connect IV tubing to the catheter, or secure the IV lock to the catheter and flush with appropriate solution (normal saline)
- Open the IV clamp to assure free flow
- Set IV infusion rate.

7) Secure the IV:

- Secure the IV catheter and tubing
- Recheck IV drip rate to make sure it is flowing at appropriate rate.
- Troubleshooting the IV, (if the IV is not working well):
 - Make sure the tourniquet is off
 - Check the IV insertion site for swelling
 - Check the IV tubing clamp to make sure it is open
 - Check the drip chamber to make sure it is half full
 - Lower the IV bag below IV site and watch for blood to return into the tubing

Venous Access-Intraosseous Proximal Humerus

Clinical Indications:

Patients where rapid, regular IV access is unavailable with any of the following:

- Cardiac Arrest
- CCR – IO is preferable
- Multisystem trauma with severe hypovolemia
- Severe dehydration with vascular collapse and/or loss of consciousness
- Respiratory failure/respiratory arrest
- Inability to establish peripheral venous access in a timely manner

AE	A-EMT	AE
P	PARAMEDIC	P

Contraindications:

- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site
- Previous intraosseous insertion or joint replacement at the selected site.

Landmark Instructions:

- Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated)



- Place your palm on the patient's shoulder anteriorly
 - The area that feels like a "ball" under your palm is the general target area
 - You should be able to feel this ball, even on obese patients, by pushing deeply
- Place the ulnar aspect of your hand vertically over the axilla
- Place the ulnar aspect of your other hand along the midline of the upper arm laterally



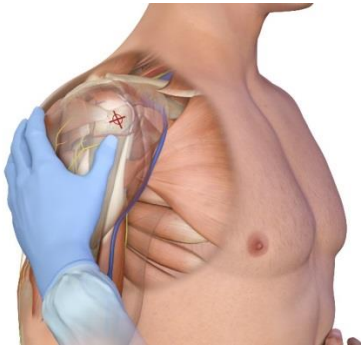
- Place your thumbs together over the arm
 - This identifies the vertical line of insertion on the proximal humerus



Procedure 38

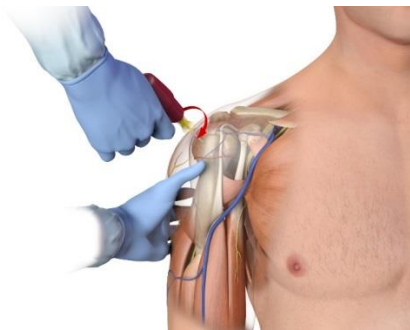
Venous Access-Intraosseous Proximal Humerus Cont.

- Palpate deeply up the humerus to the surgical neck
 - This may feel like a golf ball on a tee – the spot where the “ball” meets the “tee” is the surgical neck
 - The insertion site is 1 to 2cm above the surgical neck, on the most prominent aspect of the greater tubercle



Insertion Technique:

- Prepare the site by using antiseptic of your choice
- Use a clean, “no touch” technique
- Remove the needle set cap
- Point the needle set tip at a 45-degree angle to the anterior plane and posteromedial



- Push the needle set tip through the skin until the tip rests against the bone
- The 5mm mark must be visible above the skin for confirmation of adequate needle set length
- Gently drill into the humerus 2cm or until the hub is close to the skin
 - The hub of the needle set should be perpendicular to the skin
- Hold the hub in place and pull the driver straight off
- Continue to hold the hub while twisting the stylet off the hub with counter clockwise rotations
 - The catheter should feel firmly seated in the bone (1st confirmation of placement)
- Place the stylet in a sharps container
- Place the EZ-Stabilizer™ dressing over the hub
- Attach a primed extension set to the hub, firmly secure by twisting clockwise
- Pull the tabs off the EZ-Stabilizer dressing to expose the adhesive, apply to the skin
- Aspirate for blood/bone marrow (2nd confirmation of placement)
- Secure the arm in place across the abdomen

Pain Management:

- Prime extension set with lidocaine
- *Note that the priming volume of the extension set is approximately 1.0mL*
- Slowly infuse lidocaine 40mg IO over 120 seconds. Allow lidocaine to dwell in IO space 60 seconds
- Flush with 5 to 10mL of normal saline
- Slowly administer an additional 20mg of lidocaine IO over 60 seconds. Repeat PRN
- Consider Comfort Management Protocol for patients not responding to IO lidocaine

Venous Access-Intraosseous Distal Tibia

P PARAMEDIC P

Clinical Indications:

Patients where rapid, regular IV access is unavailable with any of the following:

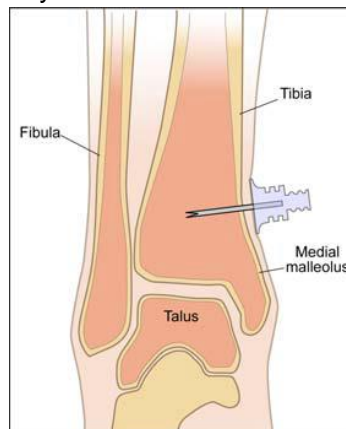
- Cardiac Arrest
- CCR – IO is preferable
- Multisystem trauma with severe hypovolemia
- Severe dehydration with vascular collapse and/or loss of consciousness
- Respiratory failure/respiratory arrest
- Inability to establish peripheral venous access in a timely manner

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:

11. Insertion site is located approximately 3cm (2 finger widths) proximal to the most prominent aspect of the medial malleolus. Palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone.
12. Cleanse the site
13. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60-90° 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.



4. Remove the stylette and place in an approved sharps container
4. Attach a 12cc syringe filled with 5cc NS; aspirate bone marrow to verify correct placement, then inject 5cc of NS to clear the lumen of the needle.
5. Attach the IV line. Use a pressure bag
6. Stabilize and secure the needle with dressings and tape
7. Paramedics may administer 20-40 mg (1-2cc) of 2% Lidocaine in adult patients who experience infusion related pain. May repeat 20 mg of Lidocaine. Refer to Comfort Control Protocol if indicated.
8. Following the administration of IO medications, flush the IO line with 10cc of IV fluid to expedite medication absorption.
9. Document the procedure, time, and result (success) on/with the PCR

Procedure 39

Venous Access-Intraosseous Proximal Tibia

Clinical Indications:

AE	A-EMT	AE
P	PARAMEDIC	P

Patients where rapid, regular IV access is unavailable with any of the following:

- Cardiac Arrest
- CCR – IO is preferable
- Multisystem trauma with severe hypovolemia
- Severe dehydration with vascular collapse and/or loss of consciousness
- Respiratory failure/respiratory arrest
- Inability to establish peripheral venous access in a timely manner

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. 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.
2. Cleanse the site
3. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60-90° 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.
4. Remove the stylette and place in an approved sharps container
5. Attach a 10cc syringe filled with 5cc NS; aspirate bone marrow to verify correct placement, then inject 5cc of NS to clear the lumen of the needle.
6. Attach the IV line. Use a pressure bag
7. Stabilize and secure the needle with dressings and tape
8. Paramedics may administer 10-20mg (1-2cc) of 2% Lidocaine in adult patients who experience infusion related pain.
9. Following the administration of IO medications, flush the IO line with 10cc of IV fluid to expedite medication absorption.
10. Document the procedure, time, and result (success) on/with the PCR.

Wound Care

E	EMR	E
B	EMT	B
AE	A-EMT	AE
P	PARAMEDIC	P

Clinical Indications:

Protection of open wounds prior to and during transport

Procedure:

- 1) 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.
- 2) Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control).
- 3) Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
- 4) Monitor wounds and/or dressing throughout transport for bleeding
- 5) Consider tourniquet use as indicated in protocol/procedure
- 6) Document the wound assessment and care in the PCR

ADENOSINE (ADENOCARD)

Class

Antiarrhythmic

Pharmacology and Actions

- A. Adenosine is an endogenous nucleoside with antiarrhythmic activity.
- B. Because of its short plasma half-life (less than 10 seconds with IV doses), the clinical effects of adenosine occur rapidly and are very brief.
- C. Produces a transient slowing of the sinus rate
- D. Has a depressant effect on the AV node.

Indications

- A. For termination of episodes of acute supraventricular tachycardia involving the AV-node.

Contraindications

- A. Second or third-degree heart block
- B. Sick sinus syndrome
- C. Known hypersensitivity to drug

Precautions

- A. Adverse effects include hypotension, flushing, dyspnea, chest pain, anxiety, and occasionally, hemodynamic disturbances - all of which are of short duration.
- B. Transient arrhythmias including asystole and blocks are common at the time of chemical cardioversion.

Administration

- A. Direct rapid intravenous bolus over 1-2 seconds of 6mg initially, followed immediately by 20mL saline flush. A second dose of 12 mg may be given after an interval of 1-2 minutes if the tachycardia persists.
- B. Pediatric dose: rapid IV 0.1 mg/kg initial dose followed immediately with a saline flush (greater than 5mL). Second dose 0.2 mg/kg rapid IV if SVT persists. Maximum first dose is 6 mg. Maximum second dose is 12mg.

Side Effects and Notes

- A. Whenever possible, establish the IV at the antecubital
- B. Adenosine is safe in patients with Wolff Parkinson-White Syndrome.
- C. Concomitant use of dipyridamole (Persantine) enhances the effects of adenosine. Smaller doses may be required.
- D. Caffeine and theophylline antagonize adenosine's effects. Larger doses may be required.
- E. Warn patients to expect a brief sensation of chest discomfort.
- F. If patient becomes hemodynamically unstable, see appropriate tachycardia algorithm.
- G. Stable, asymptomatic patients, without a history of PSVT, may not need to be treated.
- H. Any patient receiving adenosine must be on a monitor and a 12-lead EKG should be performed and documented, if available.

ALBUTEROL (PROVENTIL, VENTOLIN)

Class

Sympathomimetic (B₂Selective)

Pharmacology and Actions

- A. Has selective beta-adrenergic stimulating properties resulting in potent bronchodilation.
- B. Rapid onset of action (under 5 minutes), and duration of action between 2 - 6 hours.

Indications

- A. For relief of bronchospasm in patients with obstructive airway disease (asthma, emphysema, COPD) or allergic reactions.

Contraindications

- A. Symptomatic tachycardia
- B. Known hypersensitivity to drug

Precautions

- A. Albuterol sulfate has sympathomimetic effects. Use with caution in patients with known coronary disease. Monitor pulse, blood pressure, and cardiac monitor, in CAD patients.
- B. When inhaled, albuterol sulfate can result in paradoxical bronchospasm, which can be life threatening. If this occurs, the preparation should be discontinued immediately.

Administration

- A. For nebulizer use only
 - 1. For adults and children: place 2.5 mg/3mL albuterol into an oxygen-powered nebulizer and run at 6-8 LPM. Deliver as much of the mist as possible by nebulizer over 5-15 minutes.
 - 2. Endotracheal intubated patients may be given albuterol sulfate by attaching the nebulizer in-line.
 - 3. Patients placed on CPAP may be given albuterol sulfate by attaching the nebulizer in-line.

Side Effects and Special Notes

- A. Monitor blood pressure and heart rate closely and contact medical control if any concerns arise.
- B. Medications such as MAO inhibitors and tricyclics may potentiate tachycardia and hypertension.

AMIODARONE (CORDARONE)

Class

Antiarrhythmic agent

Pharmacology and Actions

- A. Suppresses ventricular ectopy and increases ventricular fibrillation threshold.
- B. Noncompetitive blocker of alpha and beta adrenergic receptors which can cause:
 - 1. Negative chronotropic effects
 - 2. Negative inotropic effects (the effect on cardiac output by the negative inotropic effect is balanced by a decrease in afterload and increase in coronary blood flow, which in turn improves cardiac performance [especially for patients with left ventricular failure]).
 - 3. Peripheral vasodilation (reduces afterload).
 - 4. Coronary vessel dilation
- C. Prolongs duration of cardiac potential and prolongs effective refractory period

Indications

- A. Shock resistant ventricular fibrillation or pulseless ventricular tachycardia
- B. Unstable ventricular tachycardia
- C. May be used for rate control in treatment of symptomatic atrial fibrillation or flutter when other therapies are ineffective.

Contraindications

- A. None in cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia
- B. 2nd or 3rd degree heart block in the absence of functioning pacemaker
- C. Marked bradycardia
- D. Cardiogenic shock
- E. Known hypersensitivity

Precautions

- A. Increased hypotension and bradycardia can occur when given with other beta-blockers or calcium channel blockers.
- B. May prolong QT interval. Do not administer with other medications that prolong QT interval (e.g., procainamide).
- C. Use with caution if renal failure is present, terminal elimination of amiodarone is extremely long (half-life can last up to 40 days).

Administration

- A. Pulseless VT / VF: 300 mg IV push. Consider repeating 150 mg IV/IO push in 3-5 minutes (Maximum cumulative dose is 2.2 grams IV over 24 hours).
- B. Unstable VT: 150 mg IV diluted in NS over 10 minutes. Consider repeating at same dose.

Side Effects and Special Notes

- A. Medication must be carefully and slowly drawn from vial to avoid excess air bubbles.
- B. The most commonly reported side effects include hypotension, bradycardia, AV block, PEA, and hepatotoxicity.

AMIODARONE DRIP (post-conversion)	
150 mg in 100 mL NS	
RATE (mL/hr)	DOSE (mg/min)
40	1

ASPIRIN (ASA)

Class

Platelet inhibitor/Anti-inflammatory

Pharmacology and Actions

- A. ASA inhibits blood clotting. It inhibits the formation of thromboxane A₂, a platelet aggregating, vasoconstricting prostaglandin. ASA in low doses, however, inhibits the production of thromboxane A₂ in the platelet more than it does the production of prostacyclin in the endothelial cells.
- B. Platelet aggregation has been implicated in the pathogenesis of atherosclerosis contributing to the acute episodes of TIA's, unstable angina, and acute myocardial infarction.
- C. Unstable angina is precipitated by a sudden fall in coronary blood flow. One possible mechanism is platelet aggregation.
- D. ASA has been shown to be beneficial in decreasing sudden cardiac death and myocardial infarction in patients with unstable angina.
- E. ASA has been shown to be of added benefit in maintaining vessel patency after thrombolytic therapy.

Indications

- A. Patients with chest pain or other symptoms, which may be of cardiac origin.
- B. ASA is not to be used for analgesia (i.e. headache).

Contraindications

- A. Children under 12 years of age
- B. Known hypersensitivity to drug, especially allergy induced asthma
- C. Current ulcer or GI bleed

Administration

- A. Chew four 81 mg ASA chewable tablets (324 milligrams total) if the patient is able to swallow voluntarily.

Side Effects and Special Notes

- A. ASA is one of the few interventions that has been shown to improve mortality and therefore should be considered early in the care of the patient.
- B. Patients taking Coumadin may receive aspirin.

ATROPINE

Class

Parasympatholytic (anticholinergic)

Pharmacology and Actions

- A. Increases heart rate (by blocking vagal influences).
- B. Increases conduction through AV node.
- C. Reduces motility and tone of GI tract.
- D. Reduces action and tone of urinary bladder (may cause urinary retention).
- E. Dilates pupils

Note: This drug blocks cholinergic (vagal) influences already present. If there is little cholinergic stimulation present, effects will be minimal.

Indications

- A. To counteract excessive vagal influences responsible for some bradyarrhythmias.
- B. To increase heart rate in hemodynamically significant bradycardia.
- C. To improve conduction in AV heart block at the nodal level. Will not be effective when intranodal (Mobitz type II) block is suspected.
- D. As an antidote for some insecticide exposures (organophosphate poisoning) and nerve gases with symptoms of excess cholinergic stimulation: salivation, constricted pupils, bradycardia, tearing, diaphoresis, vomiting, and diarrhea.

Precautions

- A. Bradycardias in the setting of an acute MI are common and may be beneficial. Do not treat them unless there are signs of poor perfusion (low B/P, mental confusion). If in doubt, consult with the base physician.
- B. People do well with chronic 2^d and 3^d degree block. Symptoms occur mainly with acute change. Treat the patient, not the arrhythmia.
- C. Pediatric bradycardias are most commonly secondary to hypoxia. Correct the ventilation first, and only treat the rate directly if that fails. Epinephrine is almost always the first-line medication for bradycardia in pediatric patients.

Administration

- A. Hemodynamically unstable bradycardia:
 - 1. Adult: 0.5 mg IV/IO, repeated if needed at 3-5 minute intervals to a dose of 3mg. (Stop at ventricular rate which provides adequate medication and B/P).
 - 2. Pediatric: 0.02 mg/kg IV, minimum 0.1 mg.
- B. May be given through the ET tube at 2 times the IV dose. Maximum ET dose is 6 mg.
- C. For symptomatic insecticide/organophosphate poisoning exposures: Usually begin with 2 mg IV/IO and titrate (2 mg q 5 min) until secretions are dried. Total required dose may be massive.

Side Effects and Special Notes

Remember in cardiac arrest situations that atropine dilates the pupils

ATROVENT (IPATROPIUM)

Class

Anticholinergic

Pharmacology and Actions

- A. Bronchodilation
- B. Dries respiratory tract secretions

Indications

- A. Bronchospasm related to asthma, chronic bronchitis, or emphysema

Contraindications

- A. Hypersensitivity to this drug, atropine, soy, or peanuts.

Precautions

- A. Should not be used as the primary agent for treatment of bronchospasm
- B. Use with caution in patients with coronary artery disease
- C. Pulse, blood pressure, and EKG must be monitored.

Administration

- A. Adult and Pediatrics (>2 years) dosage: place 500 mcg into an oxygen-powered nebulizer and run at 6-8 LPM. Deliver as much of the mist as possible by nebulizer over 5-15 minutes.

Side Effects and Special Notes

- A. Palpitations, dizziness, anxiety, tremors, headache, nervousness, and dry mouth
- B. Can cause paradoxical bronchospasm, if this occurs discontinue treatment.

CALCIUM CHLORIDE

Class

Cation

Pharmacology and Actions

- A. Calcium ions increase the force of myocardial contraction and thus act to increase cardiac output.
- B. Stabilizing effect on cardiac cell membranes when dangerously high potassium levels make the heart at risk for fibrillation.

Indications

- A. Hyperkalemia associated with ECG disturbance
- B. Hypocalcemia (known)
- C. Calcium channel blocker toxicity with hemodynamic compromise
- D. Magnesium (MgSO₄) toxicity

Contraindications

- A. Cardiac arrest not associated with one of the above

Precautions

- A. Cautious use in patient receiving Digoxin
- B. Do not mix with Sodium Bicarbonate, it will precipitate

Administration

- A. Cardiac Arrest:
 - Adult: 1g (10cc of 10% solution) IV/IO
- B. Calcium Channel Blocker Overdose:
 - Adult: 1 gm (10 cc of 10% solution) IV/IO over 20 minutes
 - Pediatric: 20 mg/kg slow IV/IO (maximum dose 1g)

Side Effects and Special Notes

- A. Bradycardia, usually caused by rapide administration
- B. Arrhythmias especially in patients on Digoxin
- C. Sclerosis of veins (if IV infiltrates)

DEXTROSE 50%

Class

Carbohydrate

Pharmacology and Actions

- A. Glucose is the body's basic fuel and is required for cellular metabolism. A sudden drop in blood sugar levels will result in disturbances of normal metabolism, manifested clinically as a decrease in mental status, sweating, and tachycardia. Further decreases in blood sugar may result in coma, seizures, and cardiac arrhythmias. Serum glucose is regulated by insulin, which stimulates storage of excess glucose from the blood stream, and glucagon, which mobilizes stored glucose into the bloodstream.

Indications

- A. Hypoglycemic states (i.e., insulin shock in the diabetic).
- B. The unconscious patient with an unknown history. Any patient with focal or partial neurologic deficit or altered state of consciousness, which may be due to hypoglycemia.
- C. Blood glucose test < 60 mg/dL if clinically indicated.
- D. In children with alcohol exposure, suspected sepsis, hypoperfusion or altered mental status.

Precautions

- A. In patients with clinical findings suggestive of a CVA, caution should be used when considering dextrose unless the patient has a measurable hypoglycemia.
- B. Draw appropriate blood tubes for blood sugar determination prior to administering dextrose.
- C. Extravasation of glucose can cause tissue necrosis. Ensure IV patency before and during dextrose infusion.

Administration

- A. Adult dose: 1 (one) 50 mL amp of D₅₀, IV into a secure vein (D₅₀ is 25 grams of dextrose per 50 mL).
- B. In patients older than 2 years: 1 mL/kg of D₅₀
- C. In patients 3 months to 2 years: 1mL/kg of D₂₅
- D. In patients less than 3 months: 1 mL/kg of D_{12.5}
- E. May give oral glucose preparations if the patient is awake and able to swallow effectively.

Side Effects and Special Notes

- A. One bolus should raise the blood sugar 50-100 mg/dL and, therefore, will be adequate for most patients.
- B. Effect may be delayed in elderly patients with poor circulation.
- C. Dextrose should be diluted 1:1 with normal saline (to create D₂₅W) for patients 2 years and younger.
- D. Do not withhold dextrose in a patient suspected of being hypoglycemic.

Dextrose Administration Summary Table			
Age	Threshold Glucose	Dosage	Dextrose Solution
Neonate (< 1 months)	< 60	2cc/kg	12.5%
1 months – 2 years	<60	2cc/kg	25%
> 2 years	<60	2cc/kg	50%
Adult	<70	12.5 – 25g	50%

DILTIAZEM (CARDIZEM)

Class

Calcium channel blocking agent

Pharmacology and Actions

- A. Slows AV nodal conduction
- B. Increases AV nodal refractoriness
- C. Diltiazem inhibits the influx of calcium ions during membrane depolarization of cardiac and vascular smooth muscle, i.e. it slows AV nodal conduction time and prolongs AV nodal refractoriness. Diltiazem slows the ventricular rate in patients with a rapid ventricular response during atrial fibrillation/flutter, converts PSVT to NSR and decreases total peripheral resistance in both SBP and DBP. Diltiazem is a negative inotropic agent (less potent than Verapamil) and causes a reduction in myocardial oxygen consumption.

Indications

- A. Narrow complex atrial fibrillation/flutter with rapid ventricular rate (>150)
- B. PSVT refractory to adenosine (MEDICAL CONTROL ONLY)

Contraindications

- A. Patients with impaired LV function or heart failure
- B. Complete heart block
- C. Hypotension (SBP<80), or Cardiogenic shock
- D. Recently (within past 1 hour) received IV B-blocker
- E. Patients with rapid Atrial fibrillation/flutter with history of Wolff-Parkinson-White Syndrome
- F. Sick sinus syndrome
- G. Ventricular tachycardia or wide complex tachycardia

Precautions

- A. Cautious use in patients with congestive heart failure, and patients who are already taking antihypertensive medications
- B. Monitor closely for signs of developing CHF or hypotension
- C. Monitor BP closely

Administration

- A. Adult: 10 mg slow IV bolus over 5 minutes
 - Repeat 10 mg after 15 minutes

Side Effects and Special Notes

- A. Hypotension
- B. Bradycardia
- C. Heart block

DIPHENHYDRAMINE (BENADRYL)

Class

Antihistamine

Pharmacology and Actions

- A. An antihistamine that blocks action of histamine released from the cells during an allergic reaction.
- B. Direct CNS effects, which may be a stimulant or, more commonly, a depressant, depending on individual variation.
- C. Anticholinergic, antiparkinsonian effect, which is used to treat acute dystonic reactions to antipsychotic drugs (Haldol, Thorazine, Compazine, etc.). These reactions include oculogyric crisis, acute torticollis, and facial grimacing.

Indications

- A. Moderate allergic reaction.
- B. The second-line drug in anaphylaxis and severe allergic reactions (after epinephrine).
- C. To prevent or counteract extrapyramidal reactions from antipsychotic medications.
- D. For use in intractable vomiting.

Contraindications

- A. Asthma (relative)
- B. Nursing mothers

Precautions

May have additive effect with alcohol or depressants.

Administration

- A. Adult: 25 mg slow IV push or 50 mg IM
- B. Children 8 years and younger: 1 mg/kg slow IV (not to exceed 25 mg total).

Side Effects and Special Notes

- A. May cause CNS stimulation in children.
- B. Side effects include dry mouth, dilated pupils, flushing, and drowsiness.
- C. Diphenhydramine should be used with caution in patients with asthma/COPD, glaucoma, and bladder obstruction, as all of these conditions can be exacerbated by its administration.
- D. If an IV has been or will be established for other reasons, the IV route is preferred over the IM route.

DOPAMINE (INTROPIN)

Class

Sympathetic Agonist

Pharmacology and Actions

- A. Dopamine is a chemical precursor of epinephrine. It occurs naturally in humans.
- B. Dopamine has the following dose-related effects:
 - 1. 2-10 mcg/kg/min: beta effects on heart, usually increases cardiac output without increasing heart rate or blood pressure.
 - 2. 10-20 mcg/kg/min: alpha peripheral effects cause peripheral vasoconstriction and increased blood pressure.

Indications

- A. Symptomatic hypotension from causes other than hypovolemia; such as cardiogenic shock, neurogenic shock, septic shock, and anaphylactic shock.

Contraindications

- C. Pheochromocytoma (a tumor of the adrenal gland)

Precautions

- A. Dopamine is contraindicated in hypovolemic shock. Pressor agents worsen tissue hypoxia in the presence of hypovolemia from diuretics and poor intake, careful differentiation is necessary. Invasive monitoring is often the only way to differentiate forms of shock in the elderly, and treatment with dopamine is therefore indicated in the field only in severely unstable patients with evidence of increased venous pressure.
- B. Dopamine may induce tachydysrhythmias. If the heart rate exceeds 140, the infusion should be stopped.
- C. At low doses, decreased blood pressure may occur due to peripheral vasodilatation. Increasing infusion will correct this.
- D. Should not be added to Sodium Bicarbonate or other alkaline solutions, since dopamine will be inactivated at higher pH.
- E. Tissue extravasation at the IV site can cause skin sloughing due to vasoconstriction. Be sure to make emergency department personnel aware if there has been any extravasation of dopamine-containing solutions, so that proper treatment can be instituted.
- F. Can cause hypertensive crisis in susceptible individuals.

Administration

- A. The initial infusion rate is from 5-20mcg/kg/min; expect to start at 10 mcg/kg/min this may be increased until blood pressure improves.

Side Effects and Special Notes

- A. Consultation with medical control is strongly recommended with any dosage changes.
- B. Dopamine can cause nervousness, headache, dysrhythmias, palpitations, chest pain, dyspnea, nausea and vomiting. Many of these effects are dose-related.

DOPAMINE DRIP CHART

400 mg/250 mL

DOSE (mcg/kg/min)	2	3	4	5	6	7	8	9	10	15	20
Weight (lbs. & kg)	RATE (mL/hr or gtt/min)										
	Note: Doses in the highlighted areas require a pump to deliver dose accurately										
22 lbs/10kg	1	1	2	2	2	3	3	3	4	6	8
26 lbs/12kg	1	1	2	2	3	3	4	4	4	7	9
30 lbs/14kg	1	2	2	3	3	4	4	5	5	8	10
35 lbs/16kg	1	2	2	3	4	4	5	5	6	9	12
40 lbs/18kg	1	2	3	3	4	5	5	6	7	10	14
44 lbs/20kg	2	2	3	4	5	5	6	7	8	11	15
48 lbs/22kg	2	2	3	4	5	6	7	7	8	12	16
53 lbs/24kg	2	3	4	4	5	6	7	8	9	14	18
57 lbs/26kg	2	3	4	5	6	7	8	9	10	15	20
62 lbs/28kg	2	3	4	5	6	7	8	9	10	16	21
66 lbs/30kg	2	3	5	6	7	8	9	10	11	17	22
70 lbs/32kg	2	4	5	6	7	8	10	11	12	18	24
75 lbs/34kg	3	4	5	6	8	9	10	11	13	19	26
79 lbs/36kg	3	4	5	7	8	9	11	12	14	20	27
84 lbs/38kg	3	4	6	7	9	10	11	13	14	21	28
88 lbs/40kg	3	5	6	8	9	11	12	14	15	22	30
99 lbs/45kg	3	5	7	8	10	12	14	15	17	24	34
110 lbs/50kg	4	6	8	9	11	13	15	17	19	28	38
121 lbs/55kg	4	6	8	10	12	14	17	19	21	31	41
132 lbs/60kg	4	7	9	11	14	16	18	20	22	34	45
143 lbs/65kg	5	7	10	12	15	17	20	22	24	37	49
154 lbs/70kg	5	8	11	13	16	18	21	24	26	39	52
165 lbs/75kg	6	8	11	14	17	20	23	25	28	42	56
176 lbs/80kg	6	9	12	15	18	21	24	27	30	45	60
187 lbs/85kg	6	10	13	16	19	22	26	29	32	48	64
198 lbs/90kg	7	10	14	17	20	24	27	30	34	51	68
209 lbs/95kg	7	11	14	18	21	25	29	32	36	53	71
220 lbs/100kg	8	11	15	19	23	26	30	34	38	56	74
231 lbs/105kg	8	12	16	20	24	28	32	35	39	59	79
242 lbs/110kg	8	12	17	21	25	29	33	37	41	62	82
253 lbs/115kg	9	13	17	22	26	30	35	39	43	65	86
264 lbs/120kg	9	14	18	22	27	32	36	41	45	68	90
275 lbs/125kg	9	14	19	23	28	33	37	42	47	70	94
286 lbs/130kg	10	15	19	24	29	34	39	44	49	73	98
292 lbs/135kg	10	15	20	25	30	35	40	45	51	76	101
308 lbs/140kg	10	16	21	26	31	37	42	47	52	79	105
319 lbs/145kg	11	16	22	27	33	38	43	49	54	82	109
330 lbs/150kg	11	17	22	28	34	39	45	51	56	84	112
341 lbs/155kg	12	17	23	29	35	41	46	52	58	87	116
352 lbs/160kg	12	18	24	30	36	42	48	54	60	90	120
363 lbs/165kg	12	19	25	31	37	43	49	56	62	93	124
374 lbs/170kg	13	19	25	32	38	45	51	57	64	96	128

EPINEPHRINE

Class

Sympathomimetic

Pharmacology and Actions

- A. Catecholamine with alpha and beta effects
- B. Cardiovascular: Increased heart rate, increased blood pressure, arterial vasoconstriction, increased myocardial contractile force, increased myocardial oxygen consumption, and increased myocardial automaticity and irritability
- C. Pulmonary: Potent bronchodilator

Indications

- A. Medical cardiac arrest, including:
 - 1. Ventricular fibrillation and pulseless ventricular tachycardia, asystole, and PEA
- B. Bradycardia:
 - 1. Pediatric patients with signs of poor perfusion.
- C. Asthma
- D. Mild to moderate allergic reactions, anaphylaxis or severe angioedema
- E. Life-threatening airway obstruction suspected secondary to croup or epiglottitis.

Contraindications

- A. Epinephrine 1:1000:
 - 1. Hypertension
 - 2. Pregnancy
 - 3. Patients with tachyarrhythmias
- B. Epinephrine 1:10,000 is for intravenous or endotracheal use; it should not be used in patients who do not require extensive resuscitative efforts.

Precautions

- A. Do not add to solutions containing bicarbonate.
- B. Increase in myocardial oxygen consumption can precipitate angina or MI in patients with coronary artery disease.
- C. Use with caution in patients with hypertension, hyperthyroidism, peripheral vascular disease, or cerebrovascular disease or any patient over the age of 50.
- D. Asthma is not the only cause of wheezing. Epinephrine is contraindicated in pulmonary edema.
- E. Anaphylaxis is a systemic allergic reaction with cardiovascular collapse. Angioedema involves swelling of mucous membranes; potential exists for airway compromise. Mild or moderate allergic reactions with urticaria or wheezing may progress to anaphylaxis or severe angioedema. Monitor patient carefully and treat according to patient status.
- F. Epinephrine comes in two strengths. Use of the wrong formulation will result in a ten-fold difference in dosage. Be sure to use the right one.

EPINEPHRINE CONTINUED

Administration

A. Adult

1. Cardiac arrest
 - a. 1.0 mL (10 mL of 1:10,000 solution) IV every 3-5 minutes
2. Moderate or severe allergic reactions
 - a. 0.3 (0.3 mL of 1:1000 solution) SQ/IM
3. Anaphylaxis
 - a. Consider administration of Epinephrine 0.1 mL of 1:1,000 solution or 1 mL of 1:10,000 solution IV for refractory anaphylactic shock. Dilute with 9-10 mL NS or administer with IV running wide open
4. Asthma
 - a. 0.3 (0.3 mL of 1:1000 solution) SQ/IM

B. Pediatric

1. Cardiac arrest
 - a. IV/IO dose: 0.01 mg/kg (0.1 mg/kg of 1:10,000 concentration). Administer every 3 to 5 minutes during arrest.
 - b. All tracheal doses: 0.1 mg/kg (0.1mL/kg of 1:1000 concentration). Note: Administer every 3-5 minutes of arrest until IV/IO access achieved; then begin with first IV dose.
2. Symptomatic Bradycardia
 - a. All IV/IO doses: 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration).
 - b. All tracheal doses: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
3. Mild or Moderate allergic reactions
 - a. 0.01 mg/kg (0.01 mL/kg of 1:1000 solution) SQ/IM
4. Anaphylaxis (**Contact medical control**)
 - a. 0.01 mg/kg (0.1 mL/kg of 1:10,000 solution) IV.
5. Asthma
 - a. 0.01 mg/kg (0.1 mL/kg of 1:1000 solution) SQ/IM

C. IV doses may be given through ET at 10 times the IV dose.

D. Epi Infusion:

1. Mix 2 mg of Epi 1:1,000 in 500 mL of NS. using 60 drop micro set. Concentration is 4 mcg/mL
2. Dosage is 2-10 mcg/min per protocol

	Dose in mcg/min								
Micrograms per minute	2	3	4	5	6	7	8	9	10
Drops of 60 gtt tubing per minute	30	45	60	75	90	105	120	135	150

E. Push Dose Epi:

1. Items needed:
 - a. Epi 1:10,000 prefilled syringe (cardiac dose)
 - b. 1 normal saline flush
 - c. 1 needle to draw medication
2. Mixing Instructions:
 - a. Take a 10 mL NS flush and waste 1 mL of saline so you are left with 9 mL
 - b. With this syringe of 9 mL of NS, draw up 1 mL of Epi 1:10,000 from the prefilled syringe
 Now you will have 10 mL of Epi with a concentration of 10 mcg/mL
3. Onset: 1 minute, Duration: 5-10 minutes
4. Dosing/administration:
 - a. 0.5 to 2 mL every 2-5 minutes (2-10 mcg)

Side Effects and Special Notes

- A. Anxiety, tremor, palpitations, vomiting, and headache are common.

ETOMIDATE (AMIDATE)

Class

Non-barbiturate hypnotic

Pharmacology and Actions

- A. Depresses cerebral metabolism
- B. Lacks analgesic activity
- C. Etomidate has minimal respiratory and myocardial depression

Indications

- A. Induction agent for RSA/RSI

Contraindications:

- A. Hypersensitivity
- B. Possibly sepsis/septic shock

Precautions

Administration

- A. Adult: 20 mg IV/IO
- B. Pediatric: 0.3 mg/kg IV/IO (max dose 20 mg)

Side Effects and Special Notes

- A. Depresses the respiratory drive producing apnea, requiring ventilation
- B. Hypotension
- C. Adrenal suppression
- D. Myoclonic jerks (mimics seizures)
- E. Pain at injection site
- F. On hypotensive patients use a reduced dose of 0.15 mg/kg

FENTANYL (SUBLIMAZE)

Class

Narcotic analgesic

Pharmacology and Actions

- A. Potent synthetic narcotic analgesic with actions similar to those of morphine, but action is more prompt and less prolonged
- B. The emetic effect is less than morphine.

Indications

- A. Adult and pediatric pain management
- B. Chest pain
- C. STEMI
- D. RSI (Rapid Sequence Intubation) Post placement pain management

Precautions

- A. Contraindicated in patients taking MOA inhibitors
- B. Myasthenia gravis
- C. Use with caution with head injuries, ICP, elderly, COPD, liver and kidney dysfunction, and bradydysrhythmias.

Administration

- C. Adult Pain Management
 - 1. 100 mcg slow IV/IO/IN over 2 – 3 minutes; additional dose of 50 mcg may be administered IV provided systolic BP remains above 100 mm Hg for a total max dose of 150 mcg
- D. Pediatric Pain Management
 - 1. 1 mcg/kg mixed in 5 mL normal saline and given IV push over 2-4 minutes to a maximum single dose of 100 mcg IV. Reassess patient vital signs and pain scale after 5 minutes.
- E. Chest Pain/STEMI
 - 1. 50 mcg slow IV/IO over 2 – 3 minutes; may be repeated to a total dose of 150 mcg.
- F. RSI/ Post placement pain management
 - 1. 50 mcg IV/IO up to 150 mcg total and SBP>100 mmHg

Side Effects and Special Notes

- A. Sedation, euphoria, dizziness, and diaphoresis.
- B. Seizures with high doses.
- C. Nausea and vomiting.
- D. Bronchoconstriction, respiratory depression or arrest if given as a rapid IV infusion.
- E. Can be reversed with Narcan.

GLUCAGON

Class

Hormone (antihypoglycemic agent)

Pharmacology and Actions

- A. Increases blood sugar concentration by converting liver glycogen to glucose.
- B. Relaxes smooth muscle of the GI tract.
- C. Increases heart rate and cardiac contractility.

Indications

- A. Symptomatic hypoglycemia when IV access is unsuccessful.
- B. Hypotension from beta-blocker or calcium channel blocker overdose unresponsive to normal saline bolus.
- C. Suspected symptomatic esophageal foreign body.

Contraindications

- A. Hypersensitivity to the drug

Precautions

- A. Use with caution in patients with a history of cardiovascular disease, renal disease, pheochromocytoma or insulinoma.

Administration

- A. Hypoglycemia: Adult dose; 1 mg IM
- B. Beta blocker / Ca ++ Channel Blocker OD - Contact medical control
 - 1. Adult Dose: 2mg IV
 - 2. Pediatric Dose: 0.1 mg/kg IV (max dose is 1 mg).

Side Effects and Special Notes

- A. Nausea, vomiting, and headache.
- B. When glucagon is given for hypoglycemia the patient should receive glucose as soon as possible after the administration of glucagon.

GLUCOSE (ORAL)

Class

Monosaccharide (antihypoglycemic agent)

Pharmacology and Actions

- A. Provides calories for metabolic needs
- B. Spares body proteins and loss of electrolytes

Indications

- A. Hypoglycemia

Contraindications

- A. Inability to self-administer due to altered level of consciousness

Precautions

- A. Aspiration risk in patients with altered level of consciousness

Administration

- A. Adult: Glucose paste 15 g or other oral glucose containing agent (e.g. orange juice, soda) if patient alert enough to self-administer oral agent
- B. Pediatric: 15 g is age appropriate

Side Effects and Special Notes

HALOPERIDOL (HALDOL)

Class

Major tranquilizer

Anti-psychotic

Pharmacology and Actions

- A. Appears to block dopamine receptors in the brain associated with mood & behavior
- B. Has antiemetic properties
- C. Produces mild alpha adrenergic blockade (Hypotension).
- D. May have CV side effects including QT prolongation and Torsades.
- E. May reduce seizure threshold

Indications

- A. Sedation to facilitate restraint of combative patient without IV access

Contraindications

- A. Known allergy
- B. Parkinsons disease
- C. Should not be given if other sedatives are present
- D. Should not be administered for altered behavior is a result of Talwin as sedation and anesthesia may ensue
- E. Seizure
- F. Cocaine overdose

Precautions

- A. May impair mental & physical abilities
- B. Orthostatic hypotension may result if other sedatives are used in conjunction
- C. Administer with caution when patients are taking anticoagulants
- D. Extrapyramidal or dystonic reactions may occur following administration
- E. Antihypertensive drugs may increase the likelihood of developing hypotension
- F. Should be used with extreme when patients are taking lithium
 - 1. Irreversible brain damage (encephalopathic syndrome) has been reported

Administration

- A. 5 mg I.M.

Side Effects and Special Notes

- A. EPS – extrapyramidal symptoms or dystonic reaction
- B. Restlessness or drowsiness
- C. Seizures
- D. Respiratory depression
- E. Dry mouth
- F. Hypotension
- G. Tachycardia

KETAMINE (KETALAR)

Class

Dissociative Anesthetic, NMDA receptor antagonist
Schedule III controlled substance

Pharmacology and Actions

- A. Dissociates
- B. Analgesia with minimal respiratory depression
- C. Sedation
- D. Adrenergic support, including bronchodilation
- E. Patient appears awake, but amnestic and unresponsive
- F. Excellent Safety Profile

Indications

- A. Analgesia, sedation, and dissociation for management of pain or behavior
- B. Precursor to painful procedure or airway support in bronchospasm
- C. Sedative and analgesic for Rapid Sequence Intubation (RSI)

Contraindications

- A. Pregnancy
- B. Known hypersensitivity to drug
- C. Age < 3 months

Precautions

- A. Coronary Artery Disease
- B. Uncontrolled Hypertension or Stroke
- C. Glaucoma or acute globe injury (conditions of IOP)

Administration

- A. Adult Pain: 0.5 mg/kg IV/IO, 1 mg/kg IN or 4 mg/kg IM
- B. Peds Pain: 0.25 mg/kg IV/IO/IN or 0.5 mg/kg IM
- C. Adult/Peds Sedation: 1mg/kg IV/IO over one minute

Side Effects and Notes

- A. Hypertension
- B. Tachycardia
- C. Laryngospasm
- D. Vomiting
- E. Excessive salivation
- F. Tremors
- G. Diplopia
- H. Emergence delirium in 12% (treat with benzodiazepine)

KETOROLAC (TORADOL)

Class

Non-steroidal anit-inflammatory drug (NSAIDS)

Pharmacology and Actions

- A. Acts by inhibiting the bodily synthesis of prostaglandins chemical cells of the immune system that cause redness, fever, and pain of inflammation.
- B. Lacks the sedative and anti-anxiety of Fentanyl, Morphine or Versed
- C. Used for treating inflammation and moderate to severe pain

Indications

- A. Moderate to severe pain
- B. Kidney stones/abdominal pain

Contraindications

- A. Hypersensitivity or allergies to ASA, other NSAIDS
- B. Taking Warfarin/Coumadin
- C. History of asthma
- D. GI bleeds, bleeding problems, hemophilia
- E. Hypotension
- F. >2nd trimester of pregnancy/breastfeeding mothers

Precautions

- A. Reduces the ability of blood to clot and therefore increases bleeding after an injury
- B. Use with caution in renal impairment
- C. Use with caution in patients >65 years old

Administration

- A. 30 mg over 1 minute IV
- B. 60 mg IM

Side Effects and Notes

- A. Anaphylaxis
- B. Edema
- C. Hypotension
- D. Drowsiness
- E. Rash
- F. Nausea/Vomiting
- G. Headache
- H. Bleeding disorders (prolonged bleeding time)

LABETALOL (TRANDATE)

Class

Selective dual alpha-1 & non-selective beta adrenergic blocker

Pharmacology and Actions

- A. Used to treat high blood pressure.
- B. Works by blocking these adrenergic receptors, which slows sinus heart rate, decreases peripheral vascular resistance, and decreases cardiac output.

Indications

- A. Sever hypertensive crisis

Contraindications

- A. Asthma
- B. Cardiogenic shock
- C. Cocaine induced hypertension
- D. Bradycardia/hypotension
- E. 2nd & 3rd degree heart blocks

Precautions

Administration

- A. 10 mg IV **SLOWLY**
- B. Contact medical control for second dose

Side Effects and Notes

- A. Mild & transient hypotension
- B. Postural hypotension if patient allowed upright in the first 3 hours
- C. IV push dosage MUST be administered slowly (over 2 minutes) with frequent vital checks.

LEVALBUTEROL (XOPENEX)

Class

Beta-2 adrenergic agonist

Pharmacology and Actions

- A. Relaxes the smooth muscles of all airways

Indications

- A. Acute bronchospasm
- B. Obstructive airway disease

Contraindications

- A. Known hypersensitivities
- B. Paradoxical bronchospasms

Precautions

Administration

- A. Adult/Pediatric: 1.25mg/3cc administered via nebulization
- B. Single dosage only

Side Effects and Special Notes

- A. Central Nervous System: nervousness, dizziness, tremor
- B. Cardiovascular: tachycardia, hypertension
- C. Gastrointestinal: nausea, vomiting
- D. Hypokalemia
- E. May mix with Atrovent

LIDOCAINE (XYLOCAINE)

Class

Antiarrhythmic

Pharmacology and Actions

- A. Cardiovascular
 - 1. Increased ventricular fibrillation threshold
 - 2. Decreased conduction rate and myocontractility (at toxic levels)
- B. CNS
 - 1. Stimulation
 - 2. Decreased cough reflex

Indications

- A. Pediatric cardiac arrest from VT/VF
- B. Sustained VT with a pulse
- C. Prior to intubation in head trauma (suspected increased intracranial pressure)

Contraindications

- A. Known hypersensitivity to lidocaine

Precautions

- A. High grade AV block is a relative contraindication. Do not treat ventricular escape beats or accelerated idioventricular rhythm with lidocaine.
- B. Lidocaine is metabolized in the liver, elderly patients and those with liver disease or poor liver perfusion secondary to shock or CHF are more likely to experience side effects.
- C. Side effects include drowsiness, confusion, convulsion, hypotension, bradycardia, and tachycardia.
- D. Head trauma requires careful airway management. If endotracheal intubation is appropriate, pretreatment with lidocaine may help avoid further ICP.

Administration

- A. Pediatric cardiac Arrest from VF/VT
 - 1. Initial dose of 1.0 mg/kg IV/IO
- B. Adults: Sustained ventricular tachycardia with a pulse
 - 1. 0.5 mg/kg IV/IO over 2 minutes and may be repeated in 5 – 10 minutes
- C. Pediatrics: Sustained ventricular tachycardia with a pulse
 - 1. 1 mg/kg IV/IO over 2 minutes
- D. Head Trauma
 - 1. 1.0 mg/kg IV/IO bolus: no additional bolus is required

Side Effects and Special Notes

- A. PVCs **should not** be treated with lidocaine. Hypoxia can generate PVCs and lidocaine will not help; treat the cause. Patients with PVCs and active chest pain should have their pain treated aggressively with oxygen, aspirin, and pain medications.
- B. Best available evidence currently indicates that prophylactic lidocaine (in the setting of MI without PVCs) may actually increase mortality.

LIDOCAINE DRIP CHART	
2 grams in 500 mL (4 mg/mL) titrated to effect	
RATE (mL/hr)	DOSE (mg/min)
15	1 mg/min
30	2 mg/min
45	3 mg/min
60	4 mg/min

Note with microdrip tubing mL/hr = gtt/min

LORAZEPAM (ATIVAN)

Class

Benzodiazepine

Pharmacology and Actions

- A. Sedative/hypnotic
- B. Depresses the limbic system, thalamus, and hypothalamus resulting in calming effects.
- C. Produces an amnesic effect and is also a skeletal muscle relaxant.

Indications

- A. Status epilepticus
- B. Cocaine (sympathomimetic) toxicity
- C. Behavioral emergencies in patients with severe agitation or aggressive behavior resulting in interference with patient care/crew safety
 - a. May be adjunctive treatment with haloperidol
- D. Acute anxiety states

Contraindications

- A. Acute alcohol intoxication
- B. Pregnancy (EXCEPT in Eclamptic Seizures)
- C. Respiratory insufficiency
- D. Hypotension (SBP <90 mmHg)
- E. Known hypersensitivity to benzodiazepines

Precautions

Administration

- A. Adult: 1-2 mg IV/IO/IM
 - a. May be repeated
 - b. Max dose 2 mg
 - i. *See specific protocol for a more specific dosage*
- B. Pediatric: 0.1 mg/kg IV or IM (maximum single dose 2 mg)
 - a. May be repeated after 5 minutes

Side Effects and Special Notes

- A. Central Nervous System: Confusion, drowsiness, slurred speech, muscular weakness, blurred vision
- B. Respiratory depression
- C. Hypotension (related to rapid IV administration)
- D. IV route should be administered slowly and diluted

MAGNESIUM SULFATE

Class

Anticonvulsant / Antiarrhythmic

Pharmacology and Actions

- A. Cardiac: stabilizes potassium pump, correcting repolarization. Shortens the QT interval in the presence of ventricular arrhythmias due to drug toxicity or electrolyte imbalance.
- B. Obstetrics: controls seizures by blocking neuromuscular transmission. Also lowers blood pressure and decreases cerebral vasospasm.

Indications

- A. Cardiac:
 - 1. Recommended for use in cardiac arrest only if torsades de pointes or suspected hypomagnesemia is present.
 - 2. Refractory VF (after lidocaine).
 - 3. Torsades de pointes with a pulse
- B. Obstetrics: Pregnancy >20 weeks with signs and symptoms of pre-eclampsia, defined as:
 - 1. Blood pressure > 180 mm systolic or > 120 mm diastolic with altered mental status, or,
 - 2. Seizures

Precautions

- A. AV block
- B. Decrease in respiratory or cardiac function
- C. Use with caution in patients taking digitalis

Administration

- A. Torsades de pointes (not in cardiac arrest): Loading dose of 1 gram infused slowly over 60 minutes.
- B. In pre-eclampsia/eclampsia patients, 2 grams diluted in 100 mL of normal saline over 5-20 minutes. May repeat to a total dose of 6 grams.

Side Effects and Special Notes

- A. Principle side effect is respiratory depression. Ventilatory assistance may be needed.
- B. Magnesium sulfate is very irritating when administered IV, thus dilution is always recommended.

METHYLPREDNISOLONE (SOLUMEDROL)

Class

Steroid

Pharmacology and Actions

- A. Potent anti-inflammatory properties with onset of action in several hours.

Indications

- A. Acute exacerbation of asthma/COPD
- B. Anaphylaxis/Acute allergic reactions

Contraindications

- A. Systemic fungal infections
- B. Known hypersensitivity

Precautions

- A. The rubber top of the Mix-O-Vial must be pressed so that the diluent mixes with the powder and dissolves it. Shake the mixture vigorously so that all the powder dissolves. The resulting solution must be clear in order to administer to a patient.

Administration

- A. Adult: 125 mg IV bolus over 2 minutes

Side Effects and Special Notes

- A. Adverse effects with single bolus use of Solu-Medrol are uncommon, although patients on chronic steroids are at risk for a multitude of adverse reactions.

MORPHINE

Class

Narcotic analgesic

Pharmacology and Actions

- A. Depresses the central nervous system and suppresses pain via binding at opioid receptors of the brain.
- B. Increases venous capacitance, decreases venous return and produces mild peripheral vasodilation.
- C. Increases myocardial oxygen demand.

Indications

- A. Chest pain associated with suspected myocardial ischemia
- B. Hypertension associated with chest pain and/or pulmonary edema
- C. Severe pain
- D. Thermal burns
- E. Frostbite
- F. Premedication for cardioversion or transcutaneous pacing

Contraindications

- A. Hypotension (SBP <100 mmHg) or volume depletion
- B. Head trauma
- C. Acute alcohol intoxication
- D. Acute exacerbation of asthma
- E. Known hypersensitivity

Precautions

- A. Morphine is detoxified by the liver
- B. It is potentiated by alcohol, antihistamines, barbiturates, phenothiazines and other sedatives

Administration

- A. Adult chest pain: 2-4 mg slow IVP every 5 minutes until pain relief
- B. Adult pain (other causes): 2-4 mg slow IVP every 2 minutes until pain relief
 - a. Maximum standing dose 10 mg
- C. Pediatric: 0.1 mg/kg IV/IO

Side Effects and Special Notes

- A. Central Nervous System: Euphoria, drowsiness, pupillary constriction, respiratory arrest
- D. Cardiovascular: Bradycardia, hypotension
- E. Gastrointestinal: Decreases gastric motility, nausea and vomiting
- F. Genitourinary: Urinary retention
- G. Respiratory: Bronchoconstriction, decrease cough reflex

VERSED (MIDAZOLAM)

Class

Benzodiazepine, Sedative and Hypnotic

Pharmacology and Actions

- A. CNS depressant leading to sedation and amnesia
- B. Versed is 3 to 4 times more potent than Diazepam
- C. Like other benzodiazepines, it has no effect on pain

Indications

- A. Sedation for cardioversion or transcutaneous pacing (TCP)
- B. Used with succinylcholine for rapid sequence intubation (RSI)
- C. Continued sedation of the intubated patient

Contraindications

- A. Patients with a history of hypersensitivity to benzodiazepines
- B. Narrow angle glaucoma

Precautions

- A. Can cause significant respiratory depression, apnea, and hypotension. Especially when used in combination with other sedatives such as alcohol or narcotics. Continuous pulse oximetry and cardiac monitoring are mandatory. Resuscitative equipment must be immediately available.
- B. Consider lower doses for elderly patients; significant respiratory depression, apnea, and hypotension are more frequently encountered.

Administration

- A. RSI: 2 mg IV/IO, may repeat one time if inadequate sedation obtained.
- B. Cardioversion: 2 mg slowly IV/IO if indicated; May repeat to max dose of 4 mg
- C. Pediatric maximum dosage is 10 mg.
- D. Behavioral Emergencies: 2 mg slowly IV/IO/IN if indicated; May repeat to max dose of 4 mg

Side Effects and Special Notes

- A. Hypotension
- B. Respiratory depression
- C. Amnesia

NARCAN (NALOXONE)

Class

Narcotic antagonist

Pharmacology and Actions

A. Narcan is a narcotic antagonist which completely binds to narcotic receptor sites, but which exhibits almost no pharmacological activity of its own. Duration of action: 1-4 hours.

Indications

- A. Reversal of narcotic effects, particularly respiratory depression, due to narcotic drugs ingested, injected, or administered in the course of treatment. Narcotic drugs include morphine, fentanyl, meperidine (Demerol), heroin, hydromorphone (Dilaudid), oxycodone (Percodan, Percocet), codeine, propoxyphene (Darvon), pentazocine (Talwin).
- B. Diagnostically in coma or altered mental status of unknown etiology, to rule out (or reverse) narcotic respiratory depression.
- C. Seizures of unknown etiology, to rule out narcotic overdose (particularly propoxyphene).

Precautions

- A. In patients physically dependant on narcotics, frank and occasionally violent withdrawal symptoms may be precipitated. Be prepared to restrain the patient. Titrate the dose slowly to reverse cardiac and respiratory depression, but to keep the patient groggy.
- B. May need large doses to reverse propoxyphene (darvon) overdose.

Administration

- A. Adult: 2.0 mg IV/IO/IN/IM for narcotic overdose case; May repeat 3 times.
- B. If no response is observed, this dose may be repeated after 3 minutes, if narcotic overdose is strongly suspected.
- C. May be given through ET tube at 2 times the IV dose.

Side Effects and Special Notes

- A. This drug is remarkably safe and free from side effects. Do not hesitate to use if indicated.
- B. The duration of some narcotics is longer than narcan and the patient must be monitored closely. Repeated doses of narcan may be required. Patients who have received this drug must be transported to the hospital because coma may reoccur when the narcan wears off.
- C. With an endotracheal tube in place and assisted ventilation, narcotic overdose patients may be safely managed without narcan. Think twice before totally reversing coma; airway may be lost, or (worse) the patient may become violent and may refuse transport.

NITROGLYCERIN

Class

Vasodilator

Pharmacology and Actions

- A. Cardiovascular effects include:
 - 1. Reduced venous tone, causes blood pooling in peripheral veins, decreasing venous return to the heart.
 - 2. Decreased peripheral resistance
 - 3. Dilatation of coronary arteries (if not already at maximum) and relief of coronary artery spasm.
- B. Generalized smooth muscle relaxation

Indications

- A. Angina
- B. Chest, arm, or neck pain caused by coronary ischemia
- C. Patients with 12-lead evidence of acute MI, with / without chest pain
- D. Cardiogenic pulmonary edema: to increase venous pooling, lowering cardiac preload and afterload.

Contraindications

- A. Children younger than 12 years of age.
- B. Patients currently using Viagra or similar drugs (male or female).

Precautions

- A. Generalized vasodilation may cause profound hypotension and reflex tachycardia.
- B. Use with extreme caution in hypotensive patients.
- C. Use with caution in patients with EKG evidence of a right ventricular infarct.

Administration

- A. Oral: 0.4 mg tablet / spray sublingually, may repeat every 3-5 minutes as needed for effect.

Side Effects and Special Notes

- A. Common side effects include throbbing headache, flushing, dizziness, and burning under the tongue (if given orally), these side effects may be used to check potency.
- B. Less common: orthostatic hypotension, sometimes marked.
- C. NOTE: Therapeutic effect is enhanced, but adverse effects are increased when patient is upright.
- D. Because nitroglycerin causes generalized smooth muscle relaxation, it may be effective in relieving chest pain caused by esophageal spasm.
- E. May be effective even in patients using paste, discs, or oral long-acting nitrate preparation.
- F. Patients taking Viagra or similar drugs should not be given nitroglycerin.

NITROGLYCERIN DRIP CHART	
25 mg Nitroglycerin in 250 mL of 5% Dextrose (100 mcg/mL)	
RATE (mL/hr)	DOSE (mcg/min)
3	5
6	10
9	15
12	20
15	25
18	30
21	35
24	40
27	45
30	50
33	55
36	60
39	65
42	70
45	75
48	80
51	85
54	90
57	95
60	100
63	105
66	110
69	115
72	120

ONDANSETRON (ZOFRAN)

Class

Antiemetic

Selective antagonist of the serotonin receptor subtype

Pharmacology and Actions

- A. Very effective antiemetic
- B. Action is not known, probably due to the selective antagonist receptors on neurons located in either the peripheral or central nervous systems or both

Indications

- A. Nausea and vomiting

Contraindications

- A. Known sensitivity to the drug.

Precautions

- A. Not effective in preventing motion-induced nausea and vomiting

Administration

- A. 4 mg IV/IO/PO, may repeat 4 mg if symptoms persist

Side Effects and Special Notes

- A. Headache
- B. Constipation
- C. Dizziness
- D. Musculoskeletal pain
- E. Drowsiness
- F. Fatigue
- G. Urinary retention
- H. Chest pain (rarely)

ROCURONIUM (ZEMURON)

Class

Skeletal muscle relaxant, neuromuscular blocking agent

Pharmacology and Actions

- A. Non-depolarizing neuromuscular blocking agent with intermediate to rapid onset
- B. Acts by competitive inhibition of cholinergic receptors at the motor end-plate
- C. Higher doses produce a longer duration of action

Indications for Use:

- A. Facilitate endotracheal intubation. Should be the second choice paralytic in RSI (Rapid Sequence Intubation)
- B. Provide skeletal muscle relaxation for mechanical ventilation

Contraindications

- A. Known hypersensitivity to Rocuronium
- B. Myasthenia gravis

Precautions

- A. Severe liver disease.
- B. Vancomycin and tetracycline antibiotics prolong the effects.
- C. Tegretol and Dilantin decrease the effects and duration.

Side Effects:

- A. Cardiovascular: arrhythmias, tachycardia
- B. Respiratory: bronchospasm, hiccups
- C. Dermatologic: rash, itching, injection site edema
- D. Gastrointestinal: nausea, vomiting

Administration:

- A. Rapid Sequence Intubation Dose: 1 mg/kg IVP, may repeat one time after 2 minutes if inadequate response is obtained.

Side Effects and Special Notes:

- A. Duration of effect is slightly increased in patients > 65 year
- B. Compatible with all IV solutions

SODIUM BICARBONATE

Class

Alkalinizing agent

Pharmacology and Actions

Sodium bicarbonate is an alkalotic solution, which neutralizes acids found in the body. Acids are increased when body tissues become hypoxic due to cardiac or respiratory arrest.

Indications

- A. Tricyclic overdose with arrhythmias, widened QRS complex, hypotension, and seizures.
- B. Consider in patients with prolonged cardiac arrest.
- C. Consider in dialysis patients with cardiac arrest (presumed secondary to hyperkalemia).

Contraindications

- A. Alkalotic states

Precautions

- A. Addition of too much sodium bicarbonate may result in alkalosis. Alkalosis is very difficult to reverse and can cause as many problems in resuscitation as acidosis.
- B. Not to be given with catecholamines or calcium
- C. May increase cerebral acidosis

Administration

- A. Contact medical control with any questions or concerns.
- B. For cardiac arrest / tricyclic overdose:
 - 1. Adult: 1 mEq/kg IV.
 - 2. Pediatric: 1 mEq/kg
 - 3. Neonatal: 1 mEq/kg

Side Effects and Special Notes

- A. Sodium bicarbonate administration increases CO₂ which rapidly enters cells, causing a paradoxical intracellular acidosis.
- B. Hyperosmolality of the blood can occur, resulting in cerebral impairment.
- C. Sodium bicarbonate's lack of proven efficacy and its numerous adverse effects have lead to the reconsideration of its role in cardiac resuscitation. Effective ventilation and circulation of blood during CPR are the most effective treatments for academia associated with cardiac arrest.
- D. Administration of sodium bicarbonate has not been proven to facilitate ventricular defibrillation or to increase survival in cardiac arrest. Metabolic acidosis lowers the threshold for the induction of ventricular fibrillation, but has no effect on defibrillation threshold.
- E. The inhibition effect of metabolic acidosis on the actions of catecholamines has not been demonstrated at the pH levels encountered during cardiac arrest.
- F. Metabolic acidosis from medical causes (e.g. diabetes) develops slowly, and field treatment is rarely indicated.
- G. Sodium bicarbonate may be considered for the dialysis patient in cardiac arrest due to suspected hyperkalemia.

SUCCINYLCHOLINE (ANECTINE)

Class

Short duration, depolarizing neuromuscular blocker

Pharmacology and Actions

- A. Succinylcholine is a short-acting, depolarizing skeletal muscle relaxant.
 - 1. Like acetylcholine, it combines with cholinergic receptors in the motor nerves to cause depolarization.
 - 2. Neuromuscular transmission is thus inhibited, which renders the muscles unable to be stimulated by acetylcholine.
- B. Following IV injection, complete paralysis is obtained within 60-90 seconds and persists for approximately 4 to 5 minutes.
 - 1. Effects then start to fade, and a return to normal is usually seen within 6 minutes.
 - 2. Muscle relaxation begins in the eyelids and jaw.
 - 3. It then progresses to the limbs, the abdomen, and finally the diaphragm and intercostals.
- C. It has no effect on consciousness.

Indications

- A. Succinylcholine is indicated in RSI (Rapid Sequence Intubation) to achieve temporary paralysis when endotracheal intubation is indicated and muscle tone or seizure activity prevents it.

Contraindications

- A. Penetrating eye injury
- B. Patients at risk for hyperkalemia (e.g., patients with crush or burn injuries greater than 24 hours old, severe renal failure)
- C. Known hypersensitivity to the drug.

Precautions

- A. Succinylcholine should not be administered unless personnel skilled in endotracheal intubation are present and ready to perform the procedure.
- B. Cardiac arrest and ventricular arrhythmias can occur when Succinylcholine is administered to patients with severe burns and severe crush injuries.

Administration

- A. Adult: 100 mg IV push

Side Effects and Special Notes

- A. Oxygen therapies and suction should be readily available, as should all emergency resuscitative drugs and equipment.
- B. This agent has no effect on consciousness, cerebration or pain threshold. Thus, it is crucial that an analgesic or sedative is administered prior to Succinylcholine.
- C. When the airway is secured after Succinylcholine administration and intubation, and further need for neuromuscular blockade is indicated, consider the administration of rocuronium (Zemeron).
- D. This agent may increase intragastric pressure, which could result in vomiting and possible aspiration of stomach contents.
- E. Lidocaine administration, prior to paralytic administration, reduces the rise in ICP associated with paralytic endotracheal intubation. This is especially important if there is already the possibility of ICP secondary to a head injury.

TETRACAINE (PONTOCAINE)

CLASS:

Ophthalmic anesthetic.

Pharmacology and Actions:

- A. Ester Compound
- B. Produces effects by interfering with nerve permeability to sodium.
- C. Temporary relief of pain due to corneal abrasion, foreign body or burns to eye.

Indications:

- A. Ophthalmic anesthesia for eye irrigation

Contraindications:

- A. Known globe rupture
- B. Known hypersensitivity

Precautions:**Administration:**

- A. 1-2 gtts to affected eye prior to irrigation (0.5% solution)
- B. May repeat in 5-10 minutes x4

Side Effects and Special Notes:

- A. Once drops are placed, be sure patient does not rub eyes.

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)

Approved Medical Abbreviations

D5W	- 5% dextrose in water
DBP	- diastolic blood pressure
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
L-SPINE	- lumbar spine
L/S-SPINE	- lumbar-sacral spine
L&D	- labor and delivery
LAT	- lateral
lb	- pound
LLQ	- left lower quadrant
LMP	- last menstrual period
LOC	- level of consciousness (loss of consciousness)
LR	- lactated ringers

Appendix A

Approved Medical Abbreviations

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
RLQ	- right lower quadrant
RUQ	- right upper quadrant
Rx	- medicine
RXN	- reaction
SBP	- systolic blood pressure
S/P	- status post
SOB	- shortness of breath
SQ	- subcutaneous
ST	- sinus tachycardia
SVT	- supraventricular tachycardia
Sx	- symptom
SZ	- seizure

Appendix A

Approved Medical Abbreviations

T-SPINE	- thoracic spine
T	- temperature
TIA	- transient ischemic attack
TKO	- to keep open (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)
+	- positive
-	- negative
?	- questionable
~	- approximately
>	- greater than
<	- less than
=	- equal
A	- before
p	- after
c	- with
s	- without
L	- left
R	- right
1°	- primary
2°	- secondary

Appendix A