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~ INTRODUCTION ~

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Purpose

The goal of any emergency medical services system is to provide the finest out of hospital care to all the citizens of its response area in a timely and efficient manner. In this regard, the EMS system clearly functions with the intent to prevent and limit further complications from illness or injury during the critical time prior to arrival at the hospital. The treatment guidelines found in this text are designed to immediately and definitively manage emergent patient illnesses and injuries.

Guideline Intent

These guidelines are intended to outline initial patient management for selected clinical situations. The use of standing orders under these guidelines should reduce the number of early calls to establish Medical Control. We hope this will reduce scene and transport times and expedite patient care.

These guidelines are not intended to be exhaustive. Whenever possible, options have been included to allow flexibility in patient management. Unique emergency situations require the paramedic to react quickly and judiciously with appropriate clinical interventions. However, paramedics must receive approval from Medical Control for treatment modalities not included in these guidelines. Deviations from these suggested guidelines will be reviewed by Medical Control. Paramedics are strongly encouraged to carry a copy of the William W. Backus Hospital Paramedic Guidelines on their transport vehicle.

Guideline Structure

Each guideline begins with a brief explanatory narrative that addresses clinically important parameters for that particular injury or illness being managed in the field. This narrative format was used to ensure completeness and attention to detail such that these guidelines may serve as a reference text when needed by paramedics. In this fashion, the paramedic has the immediate reference, if he/she wishes, to access the potentially important aspects of the patient’s overall management. The next section of the guideline is an algorithm designed to emphasize the assessment and treatment priorities for each injury or illness being addressed. This section clearly states those treatment measures surrounding a particular illness or injury that may be the most important aspect of patient management. This allows for a quick reference for the paramedic. In several guidelines, reference to other guidelines or appendices in the text may be made. However, the need for this type of cross-reference was kept to a minimum in order to make each guideline more complete and user friendly. Providers of emergency care should view an algorithm as a summary and memory aid. Algorithms, by nature, oversimplify. The effective care provider will use them wisely, not blindly. Some algorithms do not replace clinical understanding.

Medical Control

The following guidelines and algorithms are intended to be used by credentialed paramedics under the Medical Control of The William W. Backus Hospital. It is understood that these guidelines and algorithms are general guidelines and that treatment of individual clinical situations requires specific insight and flexibility under some circumstances.

After completion of patient assessment, appropriate treatment guidelines on standing orders should be followed to the point of the establishment of medical control. Paramedics are encouraged to establish medical control as early as possible. If unable to establish medical control while en route, the paramedic may intervene as necessary for the management of the patient. Upon arrival at the Hospital, the paramedic must explain the situation to the receiving physician and any treatment administered or withheld. An incident report detailing the communications failure must be completed and accompany the run form for further review by Medical Control within 24 hours of the incident. Departing from these guidelines without prior medical control approval is grounds for the immediate suspension or withdrawal of medical control sponsorship.

Patient Care Responsibility

The paramedic is ultimately responsible for all patient care. The paramedic reserves the right to take over patient care as the situation warrants. The paramedic may ask questions of the patient, family or other responders as necessary to acquire any information they feel is required for patient care. Never argue in the presence of a patient, other responders, family or staff.
Standard of Care
The standard of care is the basis for evaluating a claim of negligence. The paramedic is expected to act within the generally accepted standard of care. A deviation may be by action (e.g. administering the wrong medication) or by omission (failing to administer a necessary medication). What constitutes the standard of care is determined by what any reasonably prudent paramedic of similar training, skill and experience would do in like or similar circumstances. The paramedic is not held to a standard of perfection or performance in ideal circumstances. However, the paramedic is expected to perform in a reasonable and prudent manner, with due regard and consideration of the reasonably foreseeable consequences of the action taken. Anything less is considered substandard and is therefore considered a deviation from the standard of care.

Confidentiality
The patient’s right to privacy and confidentiality must be respected at all times. Everything seen and heard must be regarded as confidential and should only be discussed with those who need to know about the patient or the call. Never discuss your patient by name with anyone who does not absolutely need to know. Any documentation that has pertinent patient information is not to be taken home.

Unsafe and/or Unprofessional Practices
Anytime a paramedic is found practicing in an unsafe or unprofessional manner, he or she may be suspended from practicing as a paramedic pending further investigation from Medical Control. A written report and documentation of the incident must be submitted as soon as possible to the Prehospital Medical Director and the appropriate services’ Medical Director's office. The Prehospital Medical Director will investigate and determine the proper course of action to follow. The paramedic may not practice during this time.

Responsibilities of Paramedic Providers
- The paramedic must understand the regional EMS system in which they provide service.
- The paramedic must understand these guidelines.
- Proper use of communication equipment is essential to effective system operation. Early, accurate, brief and well-organized radio communication and notification with the hospital are of great importance. Early and concise reports are strongly urged.
- A properly completed patient care report for each patient management situation is mandatory. This report is to be completed prior to leaving the hospital unless another emergency dictates otherwise.
- The paramedic may request physician medical direction on any call in order to facilitate patient care.
- Physician medical direction must be obtained for all procedures outside established standing orders.

Conclusion
The guidelines established in this text are designed to facilitate out of hospital treatment of patients in The William W. Backus Hospital catchment area. They are not a substitute for a textbook or a training curriculum. The use of a narrative format combined with an algorithm format is designed for completeness, ease of learning and retention. We believe these to be the most comprehensive and up to date guidelines available at this time. As new treatment and patient management modalities are developed, they will be reviewed and added to the guidelines.
~ GENERAL PRACTICE GUIDELINES ~

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ROUTINE PARAMEDIC CARE

Routine paramedic care consists of all physical, emotional and cognitive preparations a paramedic must make before, during and after patient care. Paramedics must respond to the scene in a safe but timely fashion. Upon arrival consider personal safety, crew safety and the safety of other responders, bystanders and the patient. The paramedic must perform a patient assessment quickly to recognize the injury or illness so that priorities of care and transportation can be established. The paramedic must develop a treatment plan demonstrating consistent critical thinking abilities and carry it out in a timely manner. The paramedic must be able to communicate effectively in both verbal and written forms. In General routine paramedic care consists of the following:

1. Body substance isolation
2. Assuring scene safety
3. Protect EMS providers and the patient from undue exposure to communicable diseases
4. Airway- assess, maintain and protect
5. Breathing- assess, support and assist as necessary
6. Circulation- assess, support, begin CPR if necessary
7. Patient assessment-initial and focused physical exam
8. Patient past medical history-includes medications currently being taken
9. Vital Signs- pulse rate, respiration rate, blood pressure, skin color/temp/moisture, O2 saturation. Should be recorded as follows:
   - After every medication administration
   - Every 5 minutes for abnormal vital signs
   - Every 15 minutes for normal vital signs
10. Cervical spine immobilization whenever indicated.
11. Oxygen-as required to maintain O2 saturations of 96 – 100%
12. Cardiac and pulse oximetry monitoring. 3 lead EKG monitoring for all patients requiring advanced life support.
   12 Lead EKG for the following patients:
   - Chest discomfort (of suspected cardiac ischemic origin)
   - Epigastric pain
   - Dyspnea (when suspected to be cardiac related)
   - CHF/Pulmonary edema
   - Cardiogenic shock
   - Diaphoresis disproportionate with surrounding environment
   - Syncope or near syncope
   - Chest trauma
   - Altered mental status (when suspected to be cardiac related)
   - Electric shock / lightning injuries
   - Known or suspected cardiac dysrhythmia
   - Before and after cardioversion
   - Suspected CVA
13. Capnography monitoring is required for all advanced airways (ie: ET, LMA, King.)
14. Transport in a timely fashion to the nearest appropriate medical facility
15. Communicate early with Medical Control as necessary, preferably minimum 5 minutes notice when possible.
16. Place the patient in the position of comfort unless otherwise contraindicated.
17. Consider and, if appropriate, establish IV access. IV access may not be appropriate for every patient.
   Paramedics are encouraged to consider the rationale for the IV start. Likewise, it may be appropriate to start
   only a saline lock rather than hang a continuous infusion. However, an IV start should be attempted on any
   patient receiving a medication, even aspirin.
18. A properly completed patient care record for each patient management situation is mandatory. This report is to
   be completed prior to leaving the hospital unless another emergency dictates otherwise. In any event, even in
   those cases it should be completed no more than 100 minutes after the call to allow for physicians (ED &
   consultants) to review the information.
TIME CONSTRAINTS

Proper time and scene management are of paramount importance for successful patient outcomes. Paramedics are encouraged to document the time they make patient contact in addition to the time their vehicle arrives on scene. The time difference may be substantial. The on scene clock starts when the paramedic makes patient contact. Documentation is the key to justifying long scene times or delays in treatment. In addition to vital sign times, the following scene timelines should be adhered to. Any deviations from these times must be recorded on the run form.

- **5 minutes** on scene for intercepts, including trauma and cardiac arrest
- **10 minutes** on scene for trauma calls
- **15 minutes** on scene for medical calls
- **20 minutes** on scene for cardiac arrests
- **Cardiac Arrests:**
  - **3 minutes** to first defibrillation, if applicable.
  - **8 minutes** to administration of first medication.

PATIENT ASSESSMENT and HISTORY

Prehospital advanced life support often combines initial assessment and evaluation with immediate treatment. Performing a thorough patient assessment should not preclude the simultaneous establishment of treatment priorities and timely medical intervention.

Initial Assessment

Initial assessment includes the determination of the level of consciousness, patency of airway and adequacy of breathing and circulation. Treatment must address these issues first. The focused physical exam includes a rapid head to toe examination of the patient.

General appearance

- Level of consciousness
- Age, sex, approximate weight (1 kg = approximately 2.2 lbs.)
- Amount of distress (none apparent, mild, moderate, severe)

Physical Examination

Vital signs

- Pulse- rate and quality of radial pulses
- Blood pressure
- Skin- color, temperature, moisture
- Neurological status
- Glasgow coma scale (GCS 3-15)
- Pupils-equal, round, reactive to light (PERRL)
- Trauma score if indicated (see Appendix F)
- Stroke scale if indicated (see CVA/TIA guideline)
Assessment (Medical or Trauma)
- Onset: when did the symptoms begin and what was the patient doing at the time?
- Provocation: activities that change the pain/complaint
- Quality: sharp, dull, throbbing, crushing, constant vs. intermittent
- Radiation: yes/no and to where?
- Severity: rate on a scale of 1 to 10
- Time: how long has the pain/complaint lasted?

Detailed Trauma Assessment
Check for the presence of:
- Deformities
- Contusions
- Abrasions
- Punctures/penetrations
- Burns
- Tenderness
- Lacerations
- Swelling

History
- Signs and symptoms of present illness/injury
- Allergies: medications and environmental
- Medications: prescribed, illicit and over the counter
- Past Medical History
- Last Oral intake
- Events leading to the current illness/injury

DOCUMENTATION
A properly completed run form for each patient management situation is mandatory. This report is to be completed prior to leaving the hospital unless another emergency dictates otherwise. This must be the exception and not the rule.

AVOIDING DOCUMENTATION/MEDICATION ERRORS

Use Modified Soap Narratives
Write the narrative in a standard medical format of chief complaint, history, physical examination, diagnostic evaluations and interventions. Avoid placing historical items in the middle of interventions or physical examination findings following several interventions. Avoid the tendency to jump around as things enter one’s mind. Document a thorough Review of Systems, which should be a focused pertinent positive/negative list that addresses the patient’s chief complaint. Example for SOB: “Denies fever, cough, sputum, recurrent URI, sick contacts, chest pain, palpitations, dizziness/weakness.” Also document a full assessment of the net change/final update of the patient’s chief complaint. ie: “Upon turnover to RN at Bed 9, patient now A&Ox3, speaking in full sentences, RR 16 with SaO2 98% on 2 l. Neb # 2 completed.”

Stick to the Facts
Avoid sweeping statements such as “no other injury found,” “vitals normal,” “secondary unremarkable”. A well-written patient care report is objective instead of subjective. This means that your charts should stick to the facts, and leave out the personal interpretations and “spin.” For instance, don’t say your patient simply was “intoxicated.” Instead, document the facts that lead you to that conclusion, such as “patient’s speech was slurred”; “odor of alcohol on patient’s breath;” “patient admitted drinking 8 beers in the past hour” and other such objective facts.
Abandon Home-Grown Abbreviations and Filler

Many EMS providers utilize homegrown abbreviations. Reading their patient care reports can be challenging. Abbreviations are fine, but stick to ones that are common and accepted in the healthcare professions. Use only standard, acceptable medical abbreviations in your patient care reports. Use the word “patient” as few times as possible. The reader knows you are referring to the patient. For example, “pt boarded and collared, pt loaded into ambulance, pt reassessed, pt has no change in vitals” should be written as “pt boarded and collared, loaded and reassessed without change in VS”. Avoid writing vital signs in the narrative unless they lead to an intervention, critical decision or are relative to the turnover report. Vital signs should always be written in the appropriate boxes or graphic with times taken.

Spelling Counts

Finally, we know that this is a tough one, and not everyone has top-notch spelling skills, but proper spelling and grammar is important. Remember, if a jury looks at your chart someday, and your chart is full of errors, it may lead a jury to conclude you are as sloppy at patient care as you are at documentation. Nobody’s perfect in this department, and medical terminology can be especially tricky to spell properly.

Documenting Medications Administered

Care must be taken in documenting medications that you administer. Each medication should be documented separately and include dose, route of administration and time administered. Properly documenting medication doses can be tricky, so here are some helpful hints:

- Use “units”, avoid “U”
- Use “1”, avoid “1.0” (never use trailing zeros)
- Use “0.1”, avoid “.1” (always use a zero before the decimal point)

Completing the Document

A properly completed run form for each patient management situation is mandatory. This report is to be completed prior to leaving the hospital unless another emergency dictates otherwise.
~ OPERATIONAL CONFLICT GUIDELINES ~

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Responsibility for Care at the Scene

The medical care provided at the scene is the responsibility of the highest-level EMS provider who has responded by usual dispatch systems to that scene. Passers-by who stop to help, even though more highly trained than the system responders, may not assume responsibility but may be allowed to help in care at the discretion of the EMS responders.

Patient/Family Compliance Issues

Responsible, competent adults are felt to have the personal right to refuse treatment. When the patient’s judgment is impaired and/or if the patient is truly critical, treat the patient unless DNR policy is applicable. Every effort should be made to enlist family assistance in gaining patient compliance. Where refusal continues, documentation of refusal with signatures of available witnesses should be done as stated in Refusal of Care Policy to follow.

Parents who refuse treatment for a child should be continuously informed of the problem and, if there is a serious threat to the child, the police should be informed.

Where there is reasonable doubt as to the competence of the refusing patient or parent, act in the best interest of the patient using your best judgment.

Refusal of Care

There are countless reasons why a competent adult patient refuses treatment or transport when in need of medical attention. This may be one of the most challenging and perhaps the most frustrating encounters in the prehospital provider’s care of a patient. Express yourself clearly. Document your efforts fully.

All competent adults have the right to decide whether to accept or reject treatment. In every situation when a competent adult patient refuses either partial or complete medical assistance or transportation, the following steps are necessary to document a patient’s refusal of care:

Clearly advise the patient of your proposed mode of treatment and the necessity of such treatment. Make certain the patient understands this. Ask the patient if he/she fully understands your instructions. Often patients refuse without fully understanding their true medical condition as a need for immediate treatment.

Advise family members as well and try to enlist their support to encourage the patient to accept treatment and/or transport.

DO NOT BE HASTY! Patients often refuse aid initially and shortly thereafter change their minds. Once you have determined that the patient is mentally competent to sign a refusal, and all efforts to encourage him/her have otherwise failed, obtain his/her signature for refusal of care.

There should be two witnesses to the release form, if possible. Preferably witnesses should be a family member, friend, bystander, or police officer. If this is unobtainable, then the second signature should be one of the paramedics assigned to the unit. In addition to these two signatures, the signature of the paramedic obtaining the refusal form needs to be present. Whenever possible, names and addresses of witnesses should be placed on the chart in case you should need to contact them at a later date.

Document that the patient was explained the risks of refusing care and understood them.

Destination Hospital

It is the policy of OEMS that patients transported via ambulance responding to an EMS call will be taken to a general hospital with an emergency service or to an emergency facility that is recognized by OEMS and is organizationally accountable to a general hospital. A patient will be delivered to the facility that is best suited to meet the needs of the patient’s illness or injury. Patients, HMOs or private physicians often request transportation to a particular facility. While such requests can be considered, providers must also consider the medical appropriateness of the requested destination as well as the impact on service area coverage if the requested facility is located a significant distance away. In situations in which there is a life threatening condition the patient should be
transported to the nearest medical facility for stabilization before being transported to the preferred hospital. If in doubt, medical direction must be consulted.

**Ambulance Diversion**

When the hospital determines critical resources are insufficient to provide safe and timely care to additional patients, diversion of ambulances en route to the emergency department may be considered. It is the policy of Backus Hospital not to divert trauma patients that meet our trauma alert criteria except in cases of extremis. Examples of extremis may include situations in which the emergency department or the operating room encounters a hostage situation, hazardous materials contamination, fire, radiological emergency, bomb threat, overwhelmed trauma/surgical resources, etc.

Once notified of diversion status the ambulance crew or paramedic must establish early communication with the on-duty medical control physician at the diverting hospital.

If Backus Hospital is the closest facility, or the patient requests transport to Backus Hospital while on diversion status, the ambulance shall contact medical control. It is the function of medical control to determine the appropriate destination for the patient. All patients who are unstable, in the opinion of the ambulance crew, will be transported to the nearest appropriate facility regardless of diversion status. Any patient arriving at the hospital via ambulance while on diversion cannot be turned away.

Diverted ambulances are responsible to notify the new receiving hospital of all pertinent patient information.

**Physician on Scene**

Control of the medical emergency scene is the responsibility of the responding individual who is most appropriately trained and knowledgeable in providing prehospital emergency stabilization and transport.

When an EMS service under medical direction arrives at the scene of an emergency, “a doctor/patient” relationship has been established between the patient and the physician providing medical direction. The EMS provider acts as the agent of Medical Control.

A paramedic at the scene of an emergency should relinquish responsibility for patient management when the licensed physician has identified himself/herself, and has demonstrated his/her willingness to assume responsibility, accompany the patient to the hospital in the ambulance, and document on the run form and/or medical record his/her intervention.

When this occurs the paramedic should:

- Have the physician at the scene talk to the Medical Control physician.
- Follow the physician’s orders, if the treatment at the emergency scene differs from usual protocols, but is known acceptable medical treatment.
- Contact medical control and repeat all treatment over the radio for purpose of recording and documentation.

When the physician orders treatment that may be harmful to the patient, the paramedic should:

- Voice his/her objection.
- Offer no assistance with patient care that may be harmful, and document the objection.
- Immediately put the physician at the scene in contact with the medical control physician. Medical Control will explain that he/she disagrees with the treatment. It should also be stated and documented that the licensed physician must accompany the patient to the hospital.

In cases where disagreement cannot be resolved, paramedics are to follow the directive of the medical control physician.
DISASTER OPERATIONS

Service area
Many ambulances are called to the scene, often outside their primary service area. This is necessary and appropriate but requires invoking mutual aid agreements to assure provision of emergency care for the service area left without its usual providers.

Communication
The amount of information given over the radio is greatly diminished. Radio time is precious. Patients are identified only by degree of illness or injury and general class of injury, e.g. critical head injury, or minimal injury-stable-contusions. More specifics may be requested but unless that is done, details should be minimal.

Contact may be possible from an ambulance to central communication points only, rather than ambulance to hospital.

Destination hospital
Will be directed in most instances depending on type of injury and saturation of hospitals. Patients choice or nearest hospital will not be a determinant.

Care at the scene
The usual effort is to get patients away from the scene as quickly as possible. Assessments are brief with stabilization of the ABC’s and prompt transport. This is not to imply that there is a place for neglect or sloppiness but there is simply not enough time for all routines. Providers must concentrate on critical aspects of care.

“Triage” in a mass casualty scenario effects changes that include spending no time on dead victims and taking the most serious out first. At times taking more than one patient in a vehicle will conserve resources. BLS transport of patients with IV’s will free up resources to patients with more serious needs.

In the situation where transportation is significantly delayed (terrain, weather, power loss, traffic, etc.) scene care may be expanded with authorization of procedures beyond the usual. This may include medical direction by radio or dispatch of medical teams to the scene. It is expected that patients will have:
- Airway control
- Ventilation assisted, as needed
- Bleeding controlled
- Splints, boards, collars applied to limit of available supply.
- Immediate life threats managed (tension pneumothorax, sucking chest wound)
- Wounds covered and protected.

Medical Control
Standing orders may become automatically effective. Usual sponsor hospital and receiving hospital responsibilities for real time medical direction diminish significantly and providers are directed from either scene Medical Control point or Medical Control at the central communication point. In the disaster setting, the best medical direction is the use of common sense and reasonable judgment.

Records
In most areas, a brief note on the “triage tag” used will be the only record feasible at the scene or en route. The “tags” are numbered, color coded (some to denote degree or urgency) and contain writing space sufficient only for one or two comments. Where time permits, documenting patients name on the tag is helpful. It is important to briefly note treatment provided in the field.

In every instance, time and resources should be conserved reasonably.
HAZARDOUS MATERIAL INCIDENT

Introduction
This guideline assumes that you are the first and only unit to arrive on the scene. Should there already be other units on the scene, the Incident Commander’s instructions should be strictly adhered to in conjunction with this guideline.

En route and approaching the scene
1. If hazardous material involved in the incident is known while responding to the scene, began to research the hazardous material using appropriate reference material:
   - Manufacturer Safety Data Sheets (M.S.D.S.)
   - D.O.T. Emergency Guidebook
2. Approach incident from uphill and upwind if at all possible.
3. Stop your vehicle at least 1000 feet from the incident or “Safe Distance” (the distance from the incident that is considered to be free from hazard).
4. If a fire unit has not been dispatched, notify your dispatcher to do so.
5. Begin to don the proper level of protective clothing and equipment if available and trained to its use.

Arrival at the incident scene
1. Position the ambulance vehicle outside the “Hot Zone” at a safe distance.
2. Immediately establish a “hot“ zone and deny access by anyone into that area. Upon arrival of additional units, stage as necessary and establish “warm” and “cold” zones as appropriate.
3. Evaluate the magnitude of the incident and gather as much specific information as possible on the hazardous material involved without endangering personnel.
4. Coordinate closely with other responding units and/or agencies. Confirm hazardous material involved, advise best route of travel.

Decontamination
1. Further decontamination should be completed based upon the patient’s condition, environmental conditions, and resources available.
2. Isolate patient from the environment to prevent the spread of any remaining contaminants.
3. Transfer patient to a “clean, protected” crew for transport if resources are available.

Patient assessment
1. Refer to Patient Assessment Protocol on page 16.
2. In multiple patient situations, begin proper triage procedures.
PATIENT RESTRAINTS

PURPOSE
To establish a standard/guideline to be utilized only when necessary and in those situations where the patient is exhibiting behavior that the pre-hospital care provider believes presents a danger to the patient and/or others. This procedure applies to patients being treated under implied consent, Police Emergency Exam Request, Court Decree of Incapacity or as Authorized by Medical Direction. Patients who are refusing treatment should not be subjected to this procedure unless police are on scene.

STATEMENT
Use of a physical restraint on patients is permissible if the patient poses a danger to himself or others. Only the minimum amount of force necessary to control the patient and prevent harm to the patient or others is allowed. The use of a chemical restraint on a patient is indicated where safe physical restraint poses a risk of injury to the providers and/or the patient AND where the patient continues to fight against physical restraints.

INDICATIONS
Restraints are to be applied to patients only in limited circumstances:
- Behavior or threats that create or imply a danger to the patient or others.
- Safe and controlled access for medical procedures.
- Changes in mental status that impede the treatment of the patient.
- Involuntary evaluation or treatment of incompetent combative patients.
- Either a written order by the Physician ordering the transfer or an “Online Medical Direction” order allowing the restraints to be utilized in the pre-hospital arena.
- The patient is being transported in the custody of the Police Department and the arresting Officer is in the presence of the patient.

PRECAUTIONS
1. Restraints shall be used only when necessary to prevent a patient from seriously injuring him/herself or others. They MUST NOT be used as a punishment or for the convenience of the ambulance crew, but for the provision of safe transportation and treatment.
2. Any attempt to restrain a patient involves risk to the patient and the pre-hospital provider. Efforts to restrain a patient shall be done only when there is adequate assistance present.
3. During restraint procedures, every attempt should be made to avoid positions that may be associated with traumatic asphyxia.
4. Patients must have a physical examination performed (if permitted) prior to applying restraints. They should be assessed for extremity injury and for any neurological, metabolic or traumatic injury. Pre existing conditions, such as but not limited to: hypoxia, hypoglycemia, narcotic overdose, should be treated utilizing the appropriate patient care guideline.
5. A post restraint physical examination must be performed. Assessment and documentation of pulses, motor and sensation distal of each restraint and any injuries that may have occurred during the restraint process must be included.
6. Ensure that law enforcement personnel have searched the patient for weapons.
7. In the case of a violent or threatening patient, immediately contact the local Police Department for assistance.
8. Any patient in hand cuffs, shackles or “in custody” must have law enforcement, Department of Corrections or State Marshals with the patient at all times, including the patient compartment of the ambulance during transport.

VERBAL DE-ESCALATION PROCEDURE
Guidelines
1. Make every attempt not to aggravate or worsen pre-existing injuries or medical conditions
2. Attempt to control the patient with non-violent crisis intervention techniques

Procedure
1) Be aware of Proxemics
   a) Avoid invasion of the patient’s personal space
   b) Maintain a safe distance and refrain from touching
2) Be aware of Kinesics
   a) Do not use intimidating body language
   b) Keep your hands in front of your body in a non-threatening manner
   c) Use a supportive body stance while protecting your exits
3) Use Empathic Listening techniques
   a) Use therapeutic rapport
   b) Listen to patient’s concerns
   c) Only one provider should communicate with the patient
   d) Empathize, use positive feedback
4) Be aware of your Paraverbal Communications
   a) Maintain a soothing tone of voice
   b) Control your Tone, Volume and Cadence of speech
5) Set Limits as needed
   a) Limits should be simple, clear, reasonable and enforceable
   b) Limit the number of choices
   c) Calmly set boundaries of acceptable behavior

Patient Capacity Issues
1) Medical decision-making capacity is defined as the ability to give informed consent to go through a particular medical test or intervention or the ability to refuse such intervention.
2) When tasked to determine the mental capacity of a patient to refuse treatment, ask yourself these questions about your patient:
   a) Is the patient in danger of hurting himself or others?
   b) Is there or could there be an underlying medical emergency that may lead to death or worsen considerably if not treated soon?
   c) Is there an emergency medical intervention that must be made to avoid a worsening in your patient's condition?
   d) Does your patient understand the risks of refusing these treatments or interventions? Have you made those clear?
   e) These questions apply only to the patient's immediate situation, not to long-term medical care.

PHYSICAL RESTRAINT GUIDELINES
1) Use the minimum physical restraint required to accomplish necessary patient care and ensure safe transportation:
   a) If law enforcement or additional personnel are needed, call for it prior to attempting restraint procedures
   b) Do not endanger yourself or your crew
   c) Patients that are actively seizing should never be restrained.
2) The acceptable physical restraints are soft in nature and pose no threat to the patient’s extremities and/or physical presentation. These devices should be used to restrain the patient and not injure.
3) Avoid placing restraints in such a way as to preclude evaluation of the patient's medical status (airway, breathing, and circulation). Consider whether placement of restraints will interfere with necessary patient care activities or will cause further harm.
4) Patient will be restrained in a face up position.

Restraint Types
1) The recommended Physical Restraint Device is a medical soft restraint. Other acceptable means may be a tied (not taped) pillowcase or towel.
2) Only the extremities shall be restrained and these restraints must be assessed every five minutes.
3) If necessary, use cervical spine precautions (CID) to control violent head or body movements
4) Place padding under patient's head and wherever else needed to prevent the patient from further harming him/herself or restricting circulation
5) Medical Direction MUST approve any variation of a restraint device.
6) Unacceptable Device/Methods: Some unacceptable means of restraint are:
   a) Leather restraints, oxygen tubing, tape, string/rope
   b) Handcuffs (if not in the custody of an accompanying Law Enforcement Officer.)
   c) Any restraint tied around the head, neck or chest.
d) Restraining a patient’s hands and feet together behind the patient (hog-tying) is not allowed.
e) “sandwich” between Long Board and Scoop is not allowed.
f) **Restraining in the prone position is NOT ALLOWED.** This position has been associated with traumatic asphyxia and death.
g) Any position that may limit breathing, airway management or treatment/evaluation of the patient.

7) Any patient in handcuffs, shackles or “in custody” must have law enforcement, Department of Corrections or State Marshals in the patient compartment of the ambulance during transport.

**Complications of Restraints:**
1) Aspiration can occur, particularly if the patient is supine. It is the responsibility of the EMS provider to continually monitor the patient’s airway and level of consciousness.
2) Nerve injury or soft tissue damage may occur from restraints that are applied tightly.
3) Traumatic Asphyxia.

**Pediatric Considerations**
EMS personnel should attempt to notify and coordinate with parents when restraining children, if time permits and the situation is appropriate.

**Pregnancy Considerations**
Pregnant women should be restrained in a semi-reclining or left lateral recumbent position.

**CHEMICAL RESTRAINT GUIDELINES**
Sedative agents may be used to provide a safe, humane method of restraining the violently combative patient who presents a danger to themselves or others and to prevent the violently combative patient from further injury while secured by physical restraints. These patients may include but are not limited to the following:
- Alcohol and or drug-intoxicated patients
- Restless, combative head-injury patients
- Mental illness patients
- Physical abuse patients
- Physically restrained patients who continue to fight against restraints.

**Chemical Restraint Procedure**
1. Assess the possibility of using physical restraint first; evaluate the personnel needed to safely attempt to restrain the patient
2. Use of sedation for **adults** is an off-line Medical Control procedure. On-line Medical Direction is required prior to administration of sedatives to a **pediatric** patient. Clearly state the need for sedation if you think it is necessary for safety or patient care.

**Use of MIDAZOLAM (VERSED)**
1. **ADULT:** Midazolam (Versed) 2 to 4 mg IV, IM or appropriate weight based intranasal dose\(^1\).
2. **PEDIATRIC:** Contact Medical Control for Midazolam (Versed) 0.1 mg/kg IV or appropriate weight based intranasal dose\(^1\).
3. **CONTACT MEDICAL DIRECTION FOR REPEAT DOSAGES**
4. Prepare for possible hypotension and respiratory depression side effects
5. Vital signs should be assessed within the first five minutes and thereafter as appropriate
6. The violently combative patient stands a lesser chance of injury when sedated

**NOTES**
\(^1\) To determine the appropriate weight based dose of versed review the Intranasal Midazolam Protocol in the Medication appendix on page 125.
TREATMENT of POST POLICE NON-LETHAL DEVICE USE

1) OC, Capsicum, Mace, etc.
   a) Move patient to open space
   b) Allow time for substance to dissipate
   c) Decon and irrigate with water
   d) DO NOT use NS, LR or soap

2) TASER
   a) Evaluate for fall injuries
   b) Evaluate for Cardiac Dysrhythmias
   c) Evaluate for trauma from TASER Darts
   d) TASER darts may be removed by a trained police officer. EMS Providers, including Paramedics may not remove TASER darts.

3) Bean Bag Round
   a) Evaluate for trauma at impact site
   b) Impact sites of head, abdomen and chest have high incidence of serious injury and should receive extra assessment and treatment if needed.

4) Document device(s) used, impact sites and any trauma inflicted on PCR

Required Documentation (Minimum)
- An emergency existed
- The need for treatment was explained to the patient (regardless of competence)
- The patient refused treatment or was unable to consent to treatment
- Evidence of the patient’s incompetence to refuse treatment
- Failures of less restrictive methods of control (such as VERBAL DE-ESCALATION)
- The restraints were used for the safety of the patient or others
- The reasons for restraint were explained to the patient (regardless of competence)
- The type/method of restraint used and which limbs were restrained
- Injuries that occur during the restraint procedure
- Which agency(s) placed the restraints
- The ongoing assessment of PMS (distal to the restraints) and the patient’s ability to breathe
- Any assistance used for restraining (i.e.: PD, FD, Etc.)

SPECIAL NOTES:
- Constant evaluation of your patient's airway status and documentation of such is extremely important.
- The use of SaO2 monitoring may be useful in assessing distal circulation, but does not take the place of Pulses, Motor and Sensation checks.
- Law Enforcement Officials should be involved, if available, when restraining patients.
PRESUMPTION OF DEATH

Consistent with the State of CT Determination of Death/Discontinuation of Pre-Hospital Resuscitation for Adults Age 18 and Over, dated June 7, 2010, any patient found to be pulseless and breathless shall be presumed dead and no resuscitation initiated if any one or all of the following criteria apply:

I. Traumatic injury or body condition clearly indicating biological death (irreversible brain death), limited to:
   a. Decapitation: the complete severing of the head from the remainder of the patient’s body.
   b. Decomposition or putrefaction: the skin is bloated or ruptured, with or without soft tissue sloughed off, or there is the odor of decaying flesh. The presence of at least one of these signs indicated death occurred at least 24 hours previously.
   c. Transection of the torso: the body is completely cut across below the shoulders and above the hips through all major organs and vessels. The spinal column may or may not be severed.
   d. Incineration: 90% of body surface area has 3º burns as exhibited by ash rather than clothing and complete absence of body hair with charred skin.

Section (e) & (f) require additional assessment and/or confirmation*
   e. Dependent lividity with rigor mortis (when clothing is removed there is a clear demarcation of pooled blood within the body, and the body is generally rigid.) **Does NOT apply to victims of lightning strikes, drowning, or hypothermia.**
   f. Injuries incompatible with life (such as massive crush injury, complete exsanguination, severe displacement of brain matter.)

*In cases of dependent lividity with rigor mortis or in cases of injuries incompatible with life, the condition of clinical death must be confirmed by observation of the following:
   a. Reposition the airway and look, listen, and feel for at least 30 seconds for spontaneous respirations; respiration is absent.
   b. Palpate the carotid pulse for at least 30 seconds; pulse is absent.
   c. Examine the pupils of both eyes with a light; both pupils are non-reactive
   d. Lack of cardiac activity noted with a cardiac monitor in at least 2 leads.

**If all of the above components (a-d) are confirmed no resuscitation is required. Medical Control will be contacted and provided all of the above information for their approval of withholding resuscitation.**

If CPR has been initiated but all the components above have been subsequently confirmed, CPR may be discontinued and medical direction contacted and provided all of the above information for their approval of withholding resuscitation.

. **Note:** For scene safety and/or family wishes CPR may be initiated even if all criteria above have been met.

II. Pronouncement of death at the scene by a licensed Connecticut physician or authorized Registered Nurse. (An authorized Registered Nurse is from a home health care or hospice agency, who has an ongoing relationship with the patient, and is operating under orders from the patient’s private physician.)

III. Valid State of Connecticut DNR (CGS 19a-580d.) Valid means: Conforms to State specifications for color & construction, is intact, is on the wrist or ankle, and displays the patient’s name and the physician’s name. For valid appearing MA, RI, or other non-CT DNR bracelet/order, contact Medical Control immediately for authorization to withhold resuscitation.
In cases of decapitation, decomposition, transection of the torso, or incineration, the condition of clinical death must be determined by noting the nature and extent of the condition of the body as defined above. No CPR need be performed and medical direction need not be notified.

Whenever any likelihood of survival exists, resuscitation should proceed unless the patient has clearly been identified as not to receive extraordinary means of resuscitation (e.g. Valid DNR). Victims suspected of hypothermia should be administered emergency care unless Medical Control directs otherwise.

Family comfort should be considered before any such requests are made. Sometimes BLS intervention only may be appropriate with concurrence from medical control.

Documentation of a presumed death must include a complete physical assessment and physician signature.
DO NOT RESUSCITATE ORDERS

The purpose of this guideline is to provide a verification/authentication of DNR orders at the scene and/or during transport, and to clarify the role and responsibilities of EMS personnel for situations when resuscitation should not be initiated.

Whenever any likelihood of survival exists, resuscitation should proceed unless the patient has clearly been identified as not to receive extraordinary means of resuscitation (State of CT DNR). In any situation when pre-hospital personnel have a good faith basis to doubt the continued validity of the DNR order, resuscitative measures must be initiated. Patients suspected to be hypothermic should be administered emergency care unless any of the other criteria apply or Medical Control advises otherwise.

Medical Control should be contacted and briefed as to the circumstances and findings of the event. Documentation of a presumed death should include an ECG of three different leads or a Medical Control physician’s order to withhold resuscitation. The physician’s name and order must be documented and the signature of that physician must be obtained.

DNR with Signs of Life: If there is a valid DNR bracelet or DNR transfer form and there are signs of life (puls & respiration), EMS providers should provide standard appropriate treatment under existing guidelines matching the patient's condition. To request permission to withhold treatment under these conditions for any reason, contact Medical Control.

Do Not Intubate (DNI) Advanced Directive: If there is documentation of a Do Not Intubate (DNI) directive, the patient should receive full treatment per guidelines with the exception of intubation. If for any reason intubation is being considered in a patient with a documented DNI directive, Medical Control must be contacted.

Revocation of the DNR: When EMS providers are providing care in pre-hospital emergency settings, a patient or authorized representative may revoke a DNR order by removing a DNR bracelet from a patient’s extremity or by telling the EMS provider. If the EMS provider is told to revoke the DNR, the provider documents the request or causes the request to be documented in the patients permanent medical record and notifies the attending physician and the physician that issued the DNR order. CGS 19a-580d-7.

In the event that the EMS provider cannot verify the DNR status, the patient should be transported with normal care guidelines followed.

The State of Connecticut has developed a policy and procedure related to do not resuscitate orders. Medical Control endorses these and encourages each provider to become familiar with them.
# Cardiac Emergencies

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ALGORITHMIC APPROACH TO EMERGENCY CARDIAC CARE

Providers of emergency care should view an algorithm as a summary and memory aid. Algorithms, by nature, oversimplify. The effective care provider will use them wisely, not blindly. Algorithms do not replace clinical understanding.

The following clinical recommendations apply to all treatment algorithms:

- First, treat the patient, not the monitor.

- Algorithms for cardiac arrest presume that the condition under discussion persists and that CPR is always performed. CPR is the priority intervention. Interruptions in performing chest compressions shall be kept to a minimum. Push hard and push fast (100 compressions/min) while allowing the chest to fully recoil.

- Apply different interventions whenever appropriate indications exist.

- Adequate airway, ventilation, oxygenation, chest compressions and defibrillation are more important than administration of medications and take precedence over initiating IV’s or injecting medications.

- ETT administration of medications is not recommended. Intraosseous (EZ-IO) is the preferred secondary administration route. Any medication that can be given IV can be administered via intraosseous.

- With few exceptions, IV medications should always be given rapidly in bolus.

- After each IV medication, give 20-30cc bolus of IV fluid and immediately elevate the extremity. This will enhance the delivery of drugs to the central circulation, which may take 1-2 minutes.

- Consider the possible causes of the arrest: hypovolemia, hypoxia, acidosis, hyperkalemia, hypokalemia, hypothermia, drug overdose, cardiac tamponade, pneumothorax, acute myocardial infarction, hypoglycemia, trauma and pulmonary embolus. Not all of these would cause cardiac arrest but cardiac arrest may occur as a result of a deteriorating condition.

- Last, treat the patient, not the monitor.
UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE

PATIENT /SCENE ASSESSMENT

ASSess RESPONSiveness

RESPONSIVE

UNRESPONSIVE

ROUTINE PARAMEDIC CARE:
- Patient assessment
- Vital Signs
- History
- Oxygen
- Cardiac/SpO2 Monitoring
- Establish IV access

ASsess BREATHING
(OPEN THE AIRWAY: LOOK, LISTEN, FEEL)

BREATHING

NOT BREATHING

GIVE 2 VENTILATIONS THAT MAKE THE CHEST RISE.
ASSESS CIRCULATION

PULSE

No PULSE

START CPR
GIVE 5 CYCLES OF 30 COMPRESSIONS AND 2 BREATHS UNTIL
defibrillator arrives
PUSH HARD AND FAST (100/MIN) AND RELEASE COMPLETELY

VFib/VTach?

NO

YES

Intubate, start IV, continue CPR, determine Rhythm

Electrical Activity?

NO

YES

Give 1 Shock
resume CPR immediately
for 5 cycles

Suspected cause?

Dysrhythmia
Hypotension
Acute Coronary Syndrome
CHF/PE
Shock
See appropriate guideline

Go to Asystole Guideline p.26

Go to PEA Guideline p. 31.
ACUTE CORONARY SYNDROME (ACS)

Chest pain is often the presenting complaint of patients experiencing acute coronary syndromes, such as, cardiac ischemia, angina or a myocardial infarction. ACS is characterized in variety of ways, most commonly, squeezing, dull pressure and pain radiating down the arms or jaw. It may be associated with diaphoresis, difficulty breathing, anxiety, feeling of impending doom, irregular pulse rate, abnormal blood pressure, epigastric pain, and nausea/vomiting. All ACS patients must be carefully monitored until a definitive diagnosis can be made at the hospital.

**HISTORY** should include:
- **Provocation:** What caused the event?
- **Quality:** What does it feel like?
- **Recurrence:** Has this happened before?
- **Radiation:** Does the pain go anywhere?
- **Region:** Where does it hurt?
- **Severity:** Can you rate it on a 1-10 scale?
- **Time:** When did this start?
- **Pertinent positives/negatives:** Signs/symptoms patient does or does not have.

**ROUTINE PARAMEDIC CARE:**

**GENERAL PRACTICE, p 5.**

**ASPIRIN**

324 mg PO
May be withheld if the patient takes ASA regularly

**NITROGLYCERINE**

0.4 mg SL Tablet or Spray
May be repeated every 3 – 5 min.
As long as B/P > 90 mmHg
Max Admin: 3 doses

If chest pain unrelieved after 3 NTG doses and B/P > 90 mmHg:

**MORPHINE SULFATE**

2-5 mg IVP
May be repeated after 5 min.

**MAX DOSE Morphine on standing order:**

10 mg IVP

**FENTANYL**

1 mcg/kg SIVP(Max dose 50 mcg)
If age ≥ 65 divide dose into 2 doses 5 min apart
May be repeated after 10 min.

If patient develops nausea, you may administer

**ONDANSETRON 4 mg IVP**

**ESTABLISH MEDICAL CONTROL**

**NOTES**

1. If there is any question as to whether or not the patient takes ASA daily, give full 324 mg dose. Give ASA regardless of patient’s COUMADIN or PLAVIX status.

2. NITROGLYCERINE should not be withheld if the patient’s systolic B/P is > 90 mmHg. NTG may be administered without an IV established if the patient’s systolic B/P is > 90 mmHg. Attempts at securing an IV must be made.

3. If chest pain once resolved with NTG returns or if the patient demonstrates relief from the NTG, and B/P >90 mmHg administration may continue every 3-5 minutes as necessary.

4. Administration of NTG is CONTRAINDIATED if the patient has taken VIAGRA™, OR LEVITRA™, within the last 24 hours. Contact Medical Control prior to the administration of NTG.
   - If the patient has taken CIALIS™ within the last 48 hours, contact Medical Control prior to the administration of NTG.

5. MORPHINE SULFATE may cause respiratory depression. Be prepared to manage the patient’s airway as indicated.

6. FENTANYL should always be administered slowly.
ST ELEVATION MI's (STEMI)

1) Active chest pain or equivalent symptoms (nausea, SOB)
2) 12-lead ECG of good quality showing STEMI:
   i) ST-elevation
      (a) 2 mm in ≥2 contiguous leads (V1-V4) and/or
      (b) 1 mm in ≥2 contiguous leads (limb, lateral)
   ii) QRS duration ≤0.12 seconds
   iii) ***Acute MI*** or equivalent prints on 12-lead ECG; paramedic agrees
3) No major bleeding
4) No significant trauma

If the transport time to a hospital capable of primary percutaneous coronary intervention (PCI) is less than 30 minutes, you must transport the patient there. If the transport time to a PCI capable hospital is 30 minutes or longer, you should transport to the closest appropriate hospital.

NOTE

If a patient with a suspected STEMI is transported to the Plainfield Backus Emergency Care Center a STEMI Alert should be requested. This will allow PBECC staff to initiate STEMI Alert actions, which include requesting LifeStar.
**CHF/ACUTE PULMONARY EDEMA**

Severe congestive heart failure (CHF) and/or acute pulmonary edema are caused by acute left ventricular failure, resulting in pulmonary congestion. It is characterized by intense shortness of breath, cough, anxiety, cyanosis, diaphoresis, rales and/or wheezing, distended neck veins and pedal edema. In extreme cases, patients may produce pink frothy sputum.

**Routine Paramedic Care:**

General Practice, p. 5.1

- **Systolic B/P <90 mmHg?**
  - **NO**
  - **YES**

**Nitroglycerine**

0.4 – 0.8 mg SL Tablet or Spray

- May be repeated every 3 – 5 min.
- As long as B/P > 90 mmHg

- Consider CPAP **1,4**
  - Begin at 7.5 cmH\textsubscript{2}O
  - If no improvement may increase to **10 cmH\textsubscript{2}O**. (If patient is nauseous you may administer **Ondansetron 4 mg IVP**)

- If CHF unrelieved after 3 NTG doses and B/P > 90 mmHg:
  - **Morphine Sulfate**
  - **2-5 mg IVP**
  - May be repeated after 5 min.

- **MAX DOSE MS on standing order:**
  - **10 mg IVP**
  - If patient develops nausea after Morphine, you may administer **Ondansetron 4 mg IVP** (if not already given)

- **Establish Medical Control**

- **Pulse < 60 or > 150?**
  - **NO**
  - **YES**

**Administer Normal Saline**

250 cc Bolus

- **Systolic B/P <90 mmHg?**
  - **NO**
  - **YES**

**Administer Dopamine Infusion**

5-20 mcg/kg/min

- **Establish Medical Control**

**Notes**

1. CPAP - see Appendix A-Airway page 120 for specific indications, contraindications and procedures for CPAP.

2. **Nitroglycerine** should not be withheld if the patient’s systolic B/P is > 90 mmHg. NTG may be administered without an IV established if the patient’s systolic B/P is > 90 mmHg. Attempts at securing an IV must be made.
   - If B/P remains >90 mmHg administration may continue every 3-5 minutes as necessary.
   - Administration of NTG is CONTRAINDICATED if the patient has taken **VIAGRA\textsuperscript{TM}**, OR **LEVITRA\textsuperscript{TM}** within the last 24 hours. Contact Medical Control prior to the administration of NTG.
   - If the patient has taken **CIALIS\textsuperscript{TM}** within the last 48 hours, contact Medical Control prior to the administration of NTG.

3. **Nitro Paste** 1” may be applied in lieu of SL NTG once patient is on CPAP.

4. Whenever possible, **Nitroglycerine & CPAP** may be administered concurrently.
ASYSTOLE

Asystole is defined as the complete absence of electrical activity in the myocardium. Usually this represents extensive myocardial ischemia due to prolonged periods of inadequate myocardial perfusion. Most often, asystole represents a confirmation of death as opposed to a dysrhythmia requiring treatment. Once asystole has been determined, the paramedic should consider the differential diagnosis. One should always consider the possible causes of asystole and manage them accordingly. They include: drug overdose, hypokalemia, hypoxia, hypothermia and acidosis. Asystole must be confirmed in at least two leads. The use of transcutaneous pacing is no longer indicated for the treatment of asystole.

**Routine Paramedic Care:**

- Begin/continue CPR
- Obtain IV access
- Insure adequate airway
- Place NG tube (optional)
- Consider possible causes

**Rapid Scene Survey:**

Is there evidence the patient should not be resuscitated (i.e. DNR, signs of death)?

- **NO**
- **YES**

**Establish Medical Control**

Anticipate an order for the termination of efforts.

**Notes**

1. If a DNR bracelet is not present, medical control must be called.
2. **Signs of death include:** Body decomposition, decapitation, transection of torso, incineration, rigor mortis with lividity.
3. **Consider the possible causes of asystole:** Hypovolemia, Hypoxia, Acidosis, Hyperkalemia, Hypokalemia, Hypothermia, Drug overdose, Cardiac tamponade, Pneumothorax, Acute myocardial infarction, Hypoglycemia, Trauma, and Pulmonary embolus. Not all of these would cause a rapid conversion to asystole, but asystole may occur as a result of a deteriorating condition.
4. When IV access is unobtainable, the preferred secondary administration route is intraosseous (EZ-IO).

A dose of SODIUM BICARBONATE 1 mEq/kg IVP may be helpful in the asystolic patient known to have a pre-existing hyperkalemia and/or in a known overdose with tricyclic antidepressants and/or in prolonged arrest of > 20 minutes.
BRADYCARDIA

Pathologically slow heart rates usually result from hypoxemia, acidosis, hypothermia, medications (i.e. digoxin, beta blockers) and late shock. The following can all result in bradycardia: vagal stimulation, intrinsic cardiac conduction system disease, and acute myocardial infarction resulting in heart rates from sinus bradycardia to complete “third degree” heart blocks. Bradycardia may be a late finding in cases of raised intracranial pressure (ICP) due to head trauma, infection, hyperglycemia, and previous neurosurgery. Out of hospital treatment is directed to the symptomatic patient only. In treating bradycardia, as in treating tachycardia, remember, “treat the patient, not the monitor!”

**ROUTINE PARAMEDIC CARE:**

**GENERAL PRACTICE, p 5.**

- Heart rate <50 and is the patient hemodynamically stable?
- **NO** CONTINUALLY REASSESS. TREAT AS APPROPRIATE
- **YES** TRANSPORT

- CONSIDER CAUSES
  - AV Block (1st Degree, Type I or II, 2nd Degree, Complete AV Block)
  - ATROPINE 0.5 mg IVP may repeat every 3-5 minutes Max. Dose = 3 mg
  - Is Atropine effective?
  - **NO** CONSIDER CAUSES
  - **YES** TRANSCUTANEOUS PACING Go to APPENDIX D, p. 188

- Calcium Channel Blocker Toxicity
  - CALCIUM CHLORIDE 1 gram over 5 min
  - GLUCAGON 2 mg IVP
  - Is the patient still symptomatic?
  - **NO** CONSIDER CAUSES
  - **YES** ESTABLISH MEDICAL CONTROL

- Beta Blocker Toxicity
  - CONSIDER GLUCAGON 2 mg IVP and SODIUM BICARB 1 mEq/kg IVP if known acidosis
  - IF known acidosis

- ESTABLISH MEDICAL CONTROL

**NOTES**

1. Serious signs and symptoms must be related to the slow heart rate and include: hypotension, acutely altered mental status, signs of shock, ischemic chest discomfort, or acute heart failure.

2. ATROPINE may be considered for mild or moderate signs and symptoms related to the bradycardia. Use with caution in suspected MI patients. Consider faster dosing intervals for severe clinical manifestations.

3. TRANSCUTANEOUS PACING should be initiated to obtain a heart rate of 80 bpm. Slowly increase rate and energy to maintain mechanical and electrical capture and a B/P of 90 mmHg systolic.

4. EPINEPHRINE DRIP: Mix 1 mg Epi 1:1,000 in 1000 ml of normal saline
CARDIOGENIC SHOCK

Shock is defined as inadequate tissue perfusion and oxygenation resulting in abnormal tissue metabolism at the cellular level. Cardiogenic shock is the most extreme form of pump failure. It occurs when the left ventricular function is so compromised that the heart cannot meet the metabolic needs of the body. The result is a decrease in stroke volume caused by ineffective myocardial contractility. Additionally there is a decrease in cardiac output and blood pressure that result in an inadequate supply of blood to the body’s organs. Cardiogenic shock is generally caused by: myocardial infarction, congestive heart failure, and dysrhythmias. Signs and symptoms can include those of myocardial infarction, signs of shock, profound hypotension, hypoxemia, acidosis, altered mental status, sinus tachycardia or other dysrhythmias, cool, clammy, cyanotic or ashen skin and tachypnea. Patients in cardiogenic shock are severely ill and require rapid transport to the hospital.

### Routine Paramedic Care:
**General Practice, p 5.**

1. **Bolus with 250 cc NaCl or Lactated Ringers**
2. **Systolic BP > 90 mmHg?**
   - **No**
   - **Yes**
3. **Systolic BP > 90 mmHg?**
   - **No**
   - **Yes**
4. **Treat Dysrhythmias as per the appropriate guideline**
5. **Monitor and record V/S every 5 minutes, including Glasgow Coma Score.**
6. **Establish Medical Control**

### Notes
1. Lung sounds and respiratory status must be continuously monitored to avoid pulmonary edema.
NARROW COMPLEX TACHYCARDIA WITH PULSES*

**Routine Paramedic Care:**
General Practice, p 5.

If the ventricular rate is > 150 BPM, with serious signs and symptoms, prepare for immediate cardioversion. Cardioversion is seldom needed for heart rates less than 150 BPM.

**Consider sedation**
Diazepam: 2-5 mg slow IVP, or Vered: 2 to 4 mg IV or Ativan 1-2 mg.
May repeat if necessary.
**Perform Synchronized Cardioversion**
100J, 200J, 300J, 360J (or clinically equivalent biphasic energy dose)
Go to Appendix D, p. 186

---

**Obtain 12 lead ECG & determine QRS width**

NO

**Signs and Symptoms of hemodynamic instability?**
- Hypotension
- Acutely altered mental status
- Shock
- Heart Failure
- Ischemic chest pain

YES

**Narrow QRS? (< 0.12 sec)**

**Regular**

**ATTEMPT VAGAL MANEUVERS²**

**ADMINISTER ADENOSINE³**

6 mg rapid IVP
If no conversion.

12 mg rapid IVP
may repeat once if necessary

**Irregular**

**DILTIAZEM⁴**

0.25 mg/kg IVP over 2 min.
MAX DOSE: 20 mg
May be repeated after 15 min at:
0.35 mg/kg IVP over 2 min.
MAX DOSE: 25 mg

**Establish Medical Control**

NO (or Reoccurs)

Does the Rhythm Convert?

YES

**Establish Medical Control**

---

*SEE NOTES ON NEXT PAGE.*
NARROW COMPLEX TACHYCARDIA WITH PULSES NOTE’S PAGE

ATRIAL FIBRILLATION/ATRIAL FLUTTER

Atrial fibrillation is a totally chaotic activity of the atrial muscle fibers manifested by an irregularly irregular rate. In addition, since the atria are fibrillating, there is an incomplete emptying of these chambers and a loss of as much as 20% of the cardiac output. The rate can be variable, itself a problem, but in addition the loss of the “atrial kick” may, in and of itself, result in hypotension or other signs of cardiovascular compromise. Atrial flutter is an “unstable” rhythm, which may deteriorate into atrial fibrillation or return to sinus rhythm or another form of supraventricular tachycardia. For this reason, atrial flutter demands close clinical attention, especially in patients with ischemic heart disease. Atrial flutter may produce a very rapid ventricular response. This rate can be variable and may result in hypotension or other signs of cardiac compromise. Atrial flutter is occasionally the result of: acute myocardial infarction, hypoxia, pulmonary embolus, electrolyte abnormalities, toxic effects due to medication (particularly digoxin or quinidine), and thyrotoxicosis. New onset atrial flutter and fibrillation can indicate a silent ischemic event, particularly in the elderly. Prehospital treatment focuses on treating unstable patients urgently and controlling the rate, not necessarily converting the rhythm.

SUPRAVENTRICULAR TACHYCARDIA

Supraventricular tachycardia applies to all tachydysrhythmias in which the pacemaker site is originating above the ventricles. Examples of these are paroxysmal supraventricular tachycardia (PSVT), Atrial Fibrillation, Atrial Flutter with a rapid ventricular response, and junctional tachycardia with a rapid ventricular response. These disturbances are due to a reentry mechanism. Generally, these groups of tachycardias are narrow complex in nature. PSVT may be well tolerated in young patients without preexisting heart disease. In the elderly and in patients with heart disease serious problems such as myocardial ischemia, infarction, or pulmonary edema may be caused by this increased heart rate.

NOTES

If during the pharmacological treatment, the patient becomes unstable, then immediate CARDIOVERSION becomes the treatment of choice.

1. The patient’s unstable condition must be related to the tachycardia. And include: hypotension, acutely altered mental status, signs of shock, ischemic chest discomfort, & acute heart failure

2. VAGAL MANEUVERS may be attempted while establishing IV access. CAROTID SINUS MASSAGE is CONTRAINDICATED in patients with carotid bruits. Avoid ice water submersion in patients with ischemic heart disease.

3. ADENOSINE must be administered over 1-3 seconds in an IV/IO port closest to the heart. ADENOSINE must be followed rapidly by a 20 ml saline flush.

4. Avoid use if: Hypotension (< 90 mmHg), Wolfe-Parkinson White, Second or third degree AV blocks, cardiogenic shock, wide complex tachycardia, drug induced tachycardia, tachycardia due to poisoning.

The administration of DILTIAZEM is for heart rates greater than 150 and a stable but symptomatic patient. For heart rates less than 150 and if the patient is stable but symptomatic CONTACT MEDICAL CONTROL.
PULSELESS ELECTRICAL ACTIVITY (CARDIAC ARREST)

Pulseless Electrical Activity (PEA) incorporates the following rhythm disturbances: electromechanical dissociation (EMD), pseudo-EMD, idioventricular rhythms, ventricular escape rhythms, post defibrillation idioventricular rhythms, and bradydysrhythmic rhythms. The absence of a detectable pulse and the presence of some type of electrical activity other than Ventricular Tachycardia or Ventricular Fibrillation define this group of dysrhythmias. These rhythms can represent the last electrical activity of a dying myocardium, or they may indicate specific critical rhythm disturbances. Broad complex PEA can appear as a result of severe hyperkalemia, hypothermia, hypoxia, or pre-existing acidosis. Overdoses of tricyclic antidepressant, beta blockers, calcium channel blockers, and digitalis can produce PEA with specific interventions possible. The one major action that must be taken in the presence of PEA is to search for possible causes especially when you suspect the following conditions resulting in electrical activity without measurable blood pressure: hypovolemia, cardiac tamponade, tension pneumothorax, or massive pulmonary embolism.

**NOTES**

1. **Consider the possible causes of PEA: **Hypovolemia, Hypoxia, Acidosis, Hyperkalemia, Hypokalemia, Hypothermia, Drug overdose, Cardiac tamponade, Pneumothorax, Acute myocardial infarction, Hypoglycemia, Trauma, and Pulmonary embolus. Not all of these would cause a rapid conversion to asystole, but asystole may occur as a result of a deteriorating condition.
   - **NEEDLE CHEST DECOMPRESSION** may be performed on standing order for a patient in cardiac arrest with known or suspected pneumo/hemothorax.

2. When IV access is unobtainable, the preferred secondary administration route is intraosseous (EZ-IO).

A dose of SODIUM BICARBONATE 1 mEq/kg IVP may be helpful in the asystolic patient known to have a pre-existing hyperkalemia and/or in a known overdose with tricyclic antidepressants and/or in prolonged arrest of > 20 minutes.

**ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 5.**

- Perform: 5 Cycles CPR
- Insure adequate airway
- Establish IV or IO with fluid wide open
- Place NG tube (Optional)
- Consider Possible Causes

**EPINEPHRINE 1:10,000**

1.0 mg IVP/IO

Repeat every 3-5 minutes

**ESTABLISH MEDICAL CONTROL**
VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA (CARDIAC ARREST)

CPR is the priority intervention. Interruptions in performing chest compressions shall be kept to a minimum. Push hard and push fast (100 compressions/min) while allowing the chest to fully recoil. Defibrillation should be limited. Stacked shocks are not indicated.

**ROUTINE PARAMEDIC CARE:**
GENERAL PRACTICE, p 5,*

**PERSISTENT OR RECURRENT VF/VT**

**DEFIBRILLATION 360 J**

EPINEPHRINE 1:10,000
1.0 mg IVP
Repeat every 3-5 minutes

**GIVE 5 CYCLES OF CPR**

RHYTHM AFTER 5 CYCLES OF CPR?

**KNOWN VF OR PULSELESS VT**

Give 1 shock at 360 J monophasic (if biphasic use manufacturer recommended dose).

Resume CPR Immediately for 5 cycles or approx 2 min. (30 : 2)

**ASYSTOLE**
GO TO ASYSTOLE GUIDELINE, p 26 OR PEA GO TO PEA GUIDELINE, p 31

**RETURN OF SPONTANEOUS CIRCULATION**
GO TO POST-RESUSCITATION GUIDELINE, p 36

**PERSISTENT OR RECURRENT VF/VT**

**DEFIBRILLATION 360 J**

AMIODARONE
300 mg IVP
May repeat after 5 min at 150 mg IVP

**GIVE 5 CYCLES OF CPR**

ESTABLISH MEDICAL CONTROL

^ SEE NOTES ON NEXT PAGE
VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA (CARDIAC ARREST) NOTES PAGE

ACLS recommends the use of one antiarrhythmic during resuscitation. In rare cases the introduction of a second antiarrhythmic may be considered.

**Option:** After successful intubation a nasogastric tube should be placed.

1. Hypothermic cardiac arrest is treated differently. **DEFIBRILLATION** is limited to three shocks. Refer to the **HYPOTHERMIA GUIDELINE, ENVIRONMENTAL EMERGENCIES**, p. 5.

2. A **PRECORDIAL THUMP** may be helpful in a witnessed cardiac arrest.

3. When IV/IO available, give Epinephrine during CPR (before or after the shock)

4. When IV access is unobtainable, the preferred secondary administration route is intraosseous (EZ-IO).

5. Continue CPR while defibrillator is charging. Resume CPR immediately after shock. Do not pause to check rhythm or pulse.

6. If Amiodarone is unavailable may substitute Lidocaine 1-1.5 mg/kg IVP. May repeat after 5 minutes 0.5-0.75 mg/kg IVP. Maximum dose is 3 mg/kg. If successful, follow with a 1-4 mg/min drip.

A dose of **SODIUM BICARBONATE** 1 mEq/kg IVP may be helpful in the asystolic patient known to have a **pre-existing hyperkalemia** and/or in a known **overdose with tricyclic antidepressants** and/or in **prolonged arrest of > 20 minutes**.
WIDE COMPLEX TACHYCARDIA WITH PULSES*

**ROUTINE PARAMEDIC CARE:**
GENERAL PRACTICE, p 5.

**Obtain 12 lead ECG**

**NO**

**If MONOMORPHIC & UNDIFFERENTIATED**

**CONSIDER**

**ADENOSINE 6 mg rapid IVP**

If no conversion,

**ADENOSINE 12 mg rapid IVP**

**ADMINISTER**

**AMIODARONE**

150 mg over 10 min

may repeat in 5 min

If successful consider a maintenance infusion of 1 Mg/min

-OR-

**PROCAINAMIDE**

20-50 mg/min to max of 17 mg/kg

Follow with maintenance infusion of 1-4 mg/min

-IF AMIODARONE OR PROCAINIMIDE UNAVAILABLE MAY USE-

**LIDOCAINE**

1-1.5 mg/kg IVP

may repeat after 5 min

0.5-0.75 mg/kg IVP

MAX DOSE: 3 mg/kg

If successful, follow with a 1-4 mg/min drip

**ESTABLISH MEDICAL CONTROL**

If the ventricular rate is > 150 BPM, with serious signs and symptoms, prepare for immediate cardioversion. Cardioversion is seldom needed for heart rates less than 150 BPM.

**Consider sedation**

DIAZEPAM: 2-5 mg slow IVP, or VERSED: 2 to 4 mg IVP, or ATIVAN: 1-2 mg IVP,

May repeat if necessary.

**PERFORM SYNCHRONIZED CARDIOVERSION**

100J, 200J, 300J, 360J

Go to APPENDIX D, p. 186

If torsades de pointes give Magnesium Sulfate 1g over 5-6 minutes

*SEE NOTES ON NEXT PAGE.*
VENTRICULAR

Ventricular tachycardia represents a grave, life-threatening situation in which the patient requires immediate treatment. The diagnosis is suggested anytime three or more premature ventricular beats occur in succession. With ventricular tachycardia, cardiac output may drop dramatically or be absent altogether and it may progress into ventricular fibrillation. In ventricular tachycardia, the patient is considered to be in one three categories: PULSELESS; in essence in cardiopulmonary arrest (See VFib guideline). STABLE; presents with pulses, conscious, without chest pain, systolic BP greater than 90, UNSTABLE; presents with pulses, but is symptomatic (chest pain, palpitations, shortness of breath, possible signs and symptoms of congestive heart failure, hypotension (systolic BP less than 90) and a decreased level of consciousness).

WIDE COMPLEX TACHYCARDIA (Unknown Etiology)
Wide-complex tachycardias can be either ventricular or supraventricular in nature. Identification of the specific type and origin of the arrhythmia may be difficult to diagnose from an EKG and may be unnecessary for initial treatment. Wide complex tachycardias should be considered ventricular tachycardia until proven otherwise. Adenosine can be considered in the initial assessment and treatment of undifferentiated regular, monomorphic, wide-complex tachycardia when the rhythm is regular to diagnose and treat patients with wide-complex tachycardias who actually have supraventricular tachycardia with aberrant conduction.

NOTES

1 The patient’s unstable condition must be related to the tachycardia. Signs and symptoms of hemodynamic instability may include chest pain, SOB, hypotension, signs and symptoms or CHF, decreased level of consciousness and shock. If the ventricular rate is > 150 BPM, with serious signs and symptoms, prepare for immediate CARDIOVERSION. CARDIOVERSION is seldom needed for heart rates less than 150 BPM.

2 To administer Amiodarone dilute 150 mg in 100 cc of D5W and run in at 15 mg/min.

3 Avoid Procainamide if prolonged QT or CHF. Procainamide may be administered until arrhythmia suppressed, hypotension ensues, QRS Duration increases > 50%, or a maximum dose of 17 mg/kg is given.

4 If Amiodarone or Procainamide is unavailable you may substitute Lidocaine 1-1.5 mg/kg IVP. May repeat after 5 minutes 0.5-0.75 mg/kg IVP. Maximum dose is 3 mg/kg. If successful, follow with a 1-4 mg/min drip.
POST-RESUSCITATION CARE

The immediate goals of post resuscitation care are to (1) provide cardio-respiratory support to optimize tissue perfusion, especially to the brain; (2) transport the patient to the hospital emergency department and then to an appropriately equipped critical care unit; (3) attempt to identify the precipitating causes of the arrest; and (4) institute measures such as anti-arrhythmic therapy to prevent recurrence. Determine patient’s hemodynamic stability and symptoms. Patients’ responses to resuscitation vary widely. They may range from being alert with adequate spontaneous respirations and hemodynamic stability, to remaining comatose and apneic and/or having unstable circulation. Mandatory careful and frequently repeated assessments to establish cardiovascular, respiratory, and neurological status are required.

**RETURN OF SPONTANEOUS CIRCULATION**
- Assess vital signs
- Support airway, breathing and circulation
- Consider and treat causes of arrest
- Provide medication/fluid appropriate for adequate blood pressure, pulse and rhythm.

**IF THE PT BEGINS TO FIGHT ETT**
- SEE POST SEDATION INTUBATION MANAGEMENT GUIDELINE.

**IF THE PT REMAINS HYPOVENTIVE (< 90 mmHg)**
- ADMINISTER: 250 cc NaCl bolus³ repeated x1
- If unsuccessful, ADMINISTER DOPAMINE 5-20 mcg/kg/min titrate as necessary for systolic B/P > 90 mmHg

**IF BRADYCARDIA (< 60 bpm)**
- Administer: ATROPINE⁴ 0.5 mg IVP/IO
- May repeat every 3-5 minutes MAX. DOSE = 3 mg OR
- TRANSCUTANEOUS PACING: APPENDIX D, p. 188

**IF TACHYCARDIA (> 150 bpm)**
- CONSIDER CARDIOVERSION: 100J, 200J, 300J, 360J, (or biphasic equivalent) go to APPENDIX D, p. 186

**ESTABLISH MEDICAL CONTROL**

**NOTES**

1 If an antiarrhythmic was associated with the Return of Spontaneous Circulation consider continuing the drug as an infusion.

- If AMIODARONE converts the rhythm, begin a slow infusion of 1 mg/min.
- LIDOCAINE has an infusion rate of 2-4 mg/min Antiarrhythmic therapy should be withheld if heart rate < 60/min without counting PVCs. Follow the bradycardia or PVC guidelines for treatment.

If NO antiarrhythmic was administered, then no bolus or infusion should be initiated unless there is sustained, lethal ventricular ectopy (i.e. runs of VT, multifocal PVC’s, and PVC’s more than 6/min or the presence of R on T phenomenon).

2 VERSED may be administered only with a B/P > 90 mmHg systolic.

3 Check for the presence of CHF and withhold fluid bolus if present and start DOPAMINE at 5 mcg/kg/min.

4 Complete heart block and second degree type II generally do not respond to ATROPINE; use TRANSCUTANEOUS PACING.
THERAPEUTIC HYPOTHERMIA AFTER CARDIAC ARREST (THACA) CARE

Brain temperature during the first 24 hours after resuscitation from cardiac arrest may have significant effect on survival and neurological recovery. Cooling for 24 hours may decrease the chance of death and increase the change of neurological recovery. The goal of THACA is to sustain hypothermia for 24 hours from the time of initiation of cooling to a body temperature of 33 °C (91.4 ° F).

**ROUTINE PARAMEDIC CARE:**
**POST RESUSCITATION CARE, p 37.**

Patient is post cardiac arrest and currently has ROSC?

- **YES**
  - Receiving facility must be capable of continuing induced therapeutic hypothermia
  - ROSC after cardiac arrest NOT related to trauma or hemorrhage.
  - Age > 18
  - Patient has no known terminal illness (cancer, untreated AIDS, severe dementia)
  - Without gravid uterus
  - No pre-existent hypothermia with initial temp >34° C (93° F)
  - Patient is intubated, and comatose without purposeful response to pain
  - ETCO2 reading >20

  Perform & record neurological examination

  **INDUCE HYPOTHERMIA:**
  a. Expose patient
  b. Insert 2 large bore IV (if no IV access, IO may be used)
  c. Apply ice/ice packs to axilla and groin
  d. Midazolam 2-4mg (0.1mg/kg) slow IVP if systolic BP over 90
  e. Cold saline bolus of 30ml/kg to max of 2 liters
  f. If SBP below 90mmHg, administer Dopamine (5-20mcg/kg/min) to titrate BP to 90mmHg
  g. Document time of cooling initiation

- **NO**
  - Go to appropriate Cardiac Arrest Guideline.

**NOTES**

1) If ETT/LMA airway not securable, do not induce hypothermia
2) If ROSC is lost, discontinue cooling and go to appropriate guideline
3) Monitor ETCO2 and adjust to target of 40mmHg – Do not hyperventilate
4) Look for purposeful movements during neurological exam
5) Cold saline supply is 4C (39.2F)
6) Do not delay transport for cooling
7) Undergarments may remain in place
8) Frequent assessments are imperative (Airway & Neurological q 5 min)
9) If patient regains consciousness, discontinue protocol immediately

ESTABLISH MEDICAL CONTROL
~ MEDICAL EMERGENCIES ~

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ALLERGIC REACTION

An allergic reaction is an increased physiological response to an antigen after a previous exposure to the same antigen. Localized allergic reactions do not manifest multi-system involvement. It is usually non-life threatening, merely uncomfortable for the patient. The patient is hemodynamically stable and complains of minor to moderate skin manifestations or mild wheezing.

**ROUTINE PARAMEDIC CARE:**
**GENERAL PRACTICE, p 5.**

- Is the patient severely symptomatic?\(^1\)
  - NO
  - YES
    - GO TO ANAPHYLAXIS GUIDELINE, p 40.

- Is the patient wheezing?
  - NO
  - YES
    - ALBUTEROL 5.0 mg Nebulizer
    - AND
    - DIPHENHYDRAMINE 50 mg IVP or IM if no IV

- Is wheezing still present or did symptoms worsen?
  - NO
  - YES
    - Is the patient < 45 y/o with no cardiac history?
      - NO
      - YES
        - ESTABLISH MEDICAL CONTROL
        - EPINEPHRINE 1:1,000 0.3 mg SQ
        - ESTABLISH MEDICAL CONTROL

NOTES

\(^1\) Symptomatic patients may exhibit signs and symptoms of shock, feeling of impending doom, severe shortness of breath, throat constriction, anxious/agitated, difficulty swallowing, speaking, etc.
ALTERED MENTAL STATUS

An alteration in mental status is the hallmark of central nervous system (CNS) injury or illness. Any alteration in mental status is abnormal and warrants further examination. Altered mental status may be due to many factors. A common grouping of the causes for altered mental status is the following: AEIOU-TIPS; Alcoholism, Epilepsy, Insulin, Overdose, Underdose, Trauma, Infection, Psychiatric and Stroke. Various terms have been used to describe an altered LOC. These include, stuporous, lethargic, comatose, semi-comatose and drowsy. Since the interpretations of a single term varies from one person to another, it is always best to describe sensorium using the Glasgow Coma Scale or AVPU system.

**ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 5.**

- IF TRAUMA IS SUSPECTED PERFORM CERVICAL/SPINAL IMMOBILIZATION. GO TO TRAUMA GUIDELINE

- CHECK BLOOD GLUCOSE LEVEL

- Is BGL <70 mg/dl?
  - YES
    - DEXTROSE 50%
    - 12.5 - 25 grams IVP
    - OR
    - If no IV access, GLUCAGON¹
    - 1 mg IM
    - Wait 5 minutes
    - RECHECK BGL
    - If still < 70 mg/dl
    - CONSIDER REPEATING D50 OR GLUCAGON
  - NO
    - SUSPECTED NARCOTIC OVERDOSE WITH RESPIRATORY DEPRESSION?
    - NALOXONE²
    - 0.4 - 2 mg IVP
    - If no IV may be given IM or nasally via atomizer³
    - ESTABLISH MEDICAL CONTROL
    - CONSIDER OTHER CAUSES
    - SEIZURE, p 47
    - OR
    - CVA/TIA, p 42

**NOTES**

¹ Call medical control early on all pregnant patients if unable to establish IV access and glucose < 70.
² Consider if the patient has a history of IV drug abuse, track marks, etc.
³ Review the Intranasal Naloxone Protocol in the Medication appendix page 124.
ANAPHYLAXIS

Anaphylaxis is an acute, generalized, and severe antigen-antibody reaction that can become fatal. Anaphylaxis may present as a mild to severe response. Management is based upon the severity of the reaction. There are multiple causes of anaphylaxis including, antibiotics, sulfa drugs, sulfur drugs, vaccines, insect bites, contrast dyes, latex and food sensitivities. Most reactions occur within thirty minutes following antigen exposure, although the onset of symptoms varies from several seconds to hours. Severe anaphylaxis manifests with hypotension or impending airway obstruction with wheezing and/or stridor with accessory respiratory muscle use.

**ROUTINE PARAMEDIC CARE:**
GENERAL PRACTICE, p 51.

TITRATE IV TO
BP > 90 MM/HG

ADMINISTER
EPINEPHRINE 1:1,000
0.3 mg IM (in lateral thigh)
AND
DIPHENHYDRAMINE
50 mg IVP or IM if no IV

If wheezing present:
ADMINISTER
ALBUTEROL
5.0 mg Nebulizer

Is wheezing still present or did symptoms worsen?
AND
Is the patient < 45 years old with no cardiac history?

NO  YES

ESTABLISH MEDICAL CONTROL
ADMINISTER
EPINEPHRINE 1:10,000
0.3 mg slow IVP

ESTABLISH MEDICAL CONTROL

NOTES

1 Do not delay treatment to initiate IV access.
**ASTHMA/BRONCHOSPASM**

Asthma is the most common disorder presenting with bronchospasm. Bronchospasm is defined as the spasmodic narrowing (contraction) of the bronchus resulting in restricted airflow. This results in hypoventilation of the alveoli leading to hypoxemia. The cause of bronchospasm may not always be easily discernible. In addition to asthma, there are many conditions that present with bronchospasm. These include: allergic reaction, respiratory infection, changes in environmental conditions (temperature or humidity), inhalation of caustic gases (smoke, chlorine gas etc.), emotional stress, exercise and medications. Patients may present with mild to severe distress and management is based upon severity.

**Routine Paramedic Care:**

**EPINEPHRINE 1:1,000**

0.3 mg IM

- OR PROCEED TO -

**IMMEDIATE INTUBATION**

Administer nebulized medications via ETT adapter

**Establish Medical Control**

---

Is the patient in extremis or demonstrating an altered LOC?

**YES**

**COMBI-VENT**

5.0 mg ALBUTEROL AND 1.0 mg ATROVENT AEROSOL

If wheezing persists, ALBUTEROL 5.0 mg in 6 cc NS Aerosol

**Establish Medical Control**

**NO**

---

**NOTES**

1. Do not delay treatment to initiate IV access.

2. If necessary proceed to the Sedation Assisted Intubation guideline, sedation section page 100.

3. If DuoNeb® is available, administer 6 ml via nebulizer. If the volume of DuoNeb® exceeds the capacity of the nebulizer use 2.5 mg ALBUTEROL mixed with 0.5 mg ATROVENT and repeat x1 when aerosol is depleted.

   - Duo-Neb contains IPRATROPIUM BROMIDE. Ipratropium **should not** be administered to patients with known or suspected allergies to soybeans or peanuts. If an allergy is suspected, administer 5.0 mg ALBUTEROL. If wheezing persists it may be repeated, then ESTABLISH MEDICAL CONTROL.
CVA/TIA

Decreased cerebral blood flow or cerebral perfusion deprives the brain of oxygen and glucose. This leads to cellular ischemia and ultimately cerebral infarction. Inadequate blood flow to the brain can be the result of arteriosclerotic disease, hemorrhage, and emboli from atrial fibrillation. Strokes may be ischemic or hemorrhagic. Ischemic strokes are caused by occlusion of cerebral vessels by a thrombus or embolus. Hemorrhagic strokes occur with ruptured aneurysms, leaking venous malformations, or subarachnoid hemorrhage. Symptoms and lethality are determined by the duration, size and location of the infarction. The event is usually sudden in onset but progresses slowly. Temporary signs and symptoms may indicate a TIA. It is the transient nature of the symptoms making diagnosis and treatment difficult. Symptoms associated with a TIA usually resolve within 24 hours. The signs and symptoms of a stroke are similar to a TIA but last longer than 24 hours. They may include transient blindness in one eye, confusion, numbness or weakness, paralysis, difficulty with speech and comprehension, difficulty with swallowing, loss of balance, and changes in sensation.

**Cincinnati Prehospital Stroke Scale**

**Facial Droop** (have patient show teeth or smile)
- Normal - both sides of face move equally
- Abnormal - one side of face does not move as well as the other side.

**Arm Drift** (patient closes eyes and holds both arms straight out for 10 seconds)
- Normal - both arms move in the same or both arms do not move at all
- Abnormal - one arm does not move or one arm drifts down compared to the other

**Abnormal Speech** (have patient say “you can’t teach an old dog new tricks”)
- Normal - patient uses correct words with no slurring
- Abnormal - patient slurs words, uses the wrong words, or is unable to speak

*Interpretation*: If any 1 of these 3 signs is abnormal, the probability of stroke is 72%. This requires notification of a “Stroke Alert” if transporting to WWBH or L&M.

**Routine Paramedic Care:**
**General Practice**, p 5.

**Check Blood Glucose Level**
If BGL is <70 refer to **Hypoglycemia Guideline**, p 45.
*Do not withhold Glucose*

**Treat Cardiac Arrhythmias**, p 21
*As appropriate*

**Perform A Neurological Assessment**

**Establish Medical Control**
COPD

Chronic obstructive pulmonary disease is the result of any disease process that decreases the pulmonary system’s ability to perform ventilation. Those chronic diseases responsible for this condition include: asthma, bronchitis and emphysema. Symptoms include persistent dyspnea on exertion (with or without chronic cough) and less than one-half normal breathing capacity. Increased chest diameter (barrel chest) and pursed lip breathing are often seen in patients with advanced forms of this condition. COPD patients are often oxygen dependent at night or around the clock. Since they depend on a low oxygen drive to breathe, use of high flow oxygen must be with caution and attention paid to suppression of their respirations leading to decreased sensorium (CO₂ narcosis).

**NOTES**

1 Do not delay treatment to initiate IV access.

2 If DuoNeb® is available, administer 6 ml via nebulizer. If the volume of DuoNeb® exceeds the capacity of the nebulizer use 2.5 mg ALBUTEROL mixed with 0.5 mg ATROVENT and repeat x1 when aerosol is depleted.

- Duo-Neb contains IPRATROPIUM BROMIDE. Ipratropium should not be administered to patients with known or suspected allergies to soybeans or peanuts. If an allergy is suspected, administer 5.0 mg ALBUTEROL. If wheezing persists it may be repeated, then ESTABLISH MEDICAL CONTROL.

*If necessary proceed to the Sedation Assisted Intubation guideline, sedation section page 100.*
**COMPLETE AIRWAY OBSTRUCTION**

Foreign bodies may partially block the airway but still allow good air movement. In such cases the victim remains conscious, can forcefully cough, and can usually speak. Breath sounds may be noisy. These victims require no immediate action but the paramedic should be prepared to act if the airway obstruction worsens. Victims with severe airway obstructions remain conscious at first but will be unable to move enough air to cough forcefully. To determine whether a conscious person has an obstructed airway look for the universal choking sign and ask “Are you choking?” If the victim nods, “Can you speak?” If the airway obstruction is complete or severe, the patient will not be able to speak. You do not need to act if the victim can cough forcefully and speak. A strong cough is the most effective way to remove a foreign body.

**Conscious**

- Ask “Are you choking?”
  - NO
  - Ask “Can you speak?”
  - YES

**Unconscious**

- Determine unresponsiveness
- Attempt to establish an airway
- Perform chest compressions for an unconscious patient

If airway is still obstructed, perform direct laryngoscopy. Use Magill forceps to remove any foreign material.

If the airway is still obstructed, attempt endotracheal intubation.

If the airway is still obstructed, transport.

Establish medical control.

Use magill forceps to remove any foreign material.

Establish medical control.
HYPOGLYCEMIA

Hypoglycemia results when glucose is used up too rapidly, when glucose is released into the bloodstream more slowly than is needed by the body, or when excessive insulin is released into the bloodstream. Hypoglycemia is relatively common in diabetics. It occurs when too much insulin or oral antidiabetic medication is taken, not enough food is eaten, or from a sudden increase in the amount of exercise without increasing the intake of food. Symptoms associated with hypoglycemia include fatigue, malaise, irritability, trembling, headache, cold sweats, tachycardia, confusions, seizure, and coma.

Be sure to note:
- Past medical history
- Current medications (Hypoglycemic agents: insulin/pills\(^1\))
- Time of last dose?
- Previous similar episodes?
- Note any: fatigue, malaise, irritability, trembling, headache, cold sweats,

CHECK BLOOD GLUCOSE LEVEL
Is BGL < 70 mg/dl?
YES \rightarrow ESTABLISH MEDICAL CONTROL

Is patient awake & able to swallow?
YES \rightarrow ADMINISTER ORAL GLUCOSE
Wait 5 minutes
RECHECK BGL

NO \rightarrow DEXTROSE 50%
12.5 - 25 grams
IVP
OR
If no IV access
GLUCAGON\(^2\)

Wait 5 minutes
RECHECK BGL
If still < 70 mg/dl
CONSIDER REPEATING
D50

ESTABLISH MEDICAL CONTROL

NOTES

1 A partial list of some hypoglycemic agents to make note of includes: Glucophage®, Glucovance®, Micronase®, Glucotrol®, Diabeta®, Avandair®, Actos®, Precose®.

2 Call medical control early on all pregnant patients if unable to establish IV access and glucose < 70.
OVERDOSE/POISONING/ CHEMICAL EXPOSURE

All toxicological emergencies or “poisonings” involve some form of voluntary or accidental exposure to toxic chemicals or pharmacological substances. Poisoning may be the result of exposure to toxic substances from ingestion, inhalation, injection or skin absorption. The primary goal of physical assessment of the poisoned patient is to identify effects on the respiratory system, cardiovascular system and the central nervous system. Major toxicity due to serious poisoning is evident with signs of coma, dysrhythmia, GI disturbance, respiratory depression, and hyper/hypotension. Clinical management should be directed toward managing these system disorders. An overdose is the result of an individual’s intentional or accidental exposure to a pharmacological substance. The most common drugs resulting in overdose are narcotics, central nervous system depressants, central nervous system stimulants, and hallucinogens. It is strongly recommended that medical control and/or Poison Control be utilized during the management of these patients.

DECONTAMINATE

As necessary

TREAT DYSRRHYTHMIAS

APPROPRIATELY

ROUTINE PARAMEDIC CARE:

GENERAL PRACTICE, p 5.

OVERDOSE SUSPECTED?

GO TO ALTERED MENTAL STATUS GUIDELINE, p 39

OBTAIN THE FOLLOWING:

• Name and ingredients of substance taken
• The amount taken
• Approximate time substance was taken
• Method: ingestion, injection, inhalation, absorption
• Vomiting prior to arrival

• Attempt to locate and transport the substance’s container or MSDS if available
• Reason for ingestion: suicide, accidental overdose, and mixture of incompatible substances.

INGESTION

DO NOT INDUCE VOMITING

INHALATION

GO TO ALTERED MENTAL STATUS GUIDELINE, p 39

ESTABLISH MEDICAL CONTROL

INJECTION

GO TO ALTERED MENTAL STATUS GUIDELINE, p 39

Absorption

• Evaluate for safety consideration as a HAZMAT Incident.
• Notify the Fire Dept as indicated
• Follow BLS Hazmat Guidelines
• Routine ALS Care

Medical Emergencies  December-2013  46
DECONTAMINATION

If you are unable to completely decontaminate the patient prior to transport, contact the receiving hospital ASAP

- Request that the hospital be prepared to decontaminate patient.
- Arrange to have MSDS information faxed to receiving hospital ED.
- Bring a copy of MSDS sheet to ED with patient.
- On arrival at the hospital, do not enter until directed by the Decon Team leader.
- Follow instructions of team leader or designee

HOSPITAL FAX NUMBERS

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Fax Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.W. Backus Hospital</td>
<td>860-823-1501</td>
</tr>
<tr>
<td>Day Kimball Hospital</td>
<td>860-963-6368</td>
</tr>
<tr>
<td>Windham Hospital</td>
<td>860-456-6771</td>
</tr>
<tr>
<td>L+M Hospital</td>
<td>860-444-3733</td>
</tr>
</tbody>
</table>
**ADULT SEIZURE**

A seizure is a temporary alteration in behavior due to the abnormal electrical discharge of one or more groups of neurons in the brain. Seizures can present in several different forms: generalized or grand mal, focal motor and status epilepticus. The most common cause of seizures is idiopathic epilepsy. However, there are several other causes: alcohol abuse or withdrawal, hypoglycemia, head trauma, vascular disorders, CVA, overdose, infection, fever, psychiatric, electrolyte abnormalities, eclampsia, hypoxia, toxic exposures, drug withdrawal and structural brain disorders such as tumors. The seizure may be followed by a post-ictal state or complete coma depending upon cause. Treatment should be initiated based upon history and clinical presentation.

**Routine Paramedic Care:**  
**General Practice, p5.**  
**And Protect the patient from harm.**

Wait 5 minutes  
Recheck BGL  
If still < 70 mg/dl  
Consider repeating  
D50 or Glucagon

---

**IF TRAUMA IS SUSPECTED PERFORM CERVICAL/SPINAL IMMOBILIZATION. GO TO TRAUMA GUIDELINE**

Check Blood Glucose Level

Is BGL < 70 mg/dl?

- **YES**
  - Suspected Narcotic Overdose?
    - **NO**
      - Diazepam 5-10 mg slow IVP or IM  
        - Or Versed 5 mg IV or IM  
        - Or appropriate weight based intranasal dose  
        - Or administer Ativan 1-2 mg slow IV or IM
    - **YES**
      - Naloxone 0.4-2 mg IVP  
        - If no IV may be given IM or 2 mg nasally via atomizer.

- **NO**
  - Consider other causes and treat as appropriate
  - Transport and reassess  
  - Continue routine paramedic care  
  - Treat as appropriate
  - Establish medical control

---

**NOTES**

1 Call medical control early on all pregnant patients if unable to establish IV access and glucose < 70.
2 To determine the appropriate weight based dose of Versed review the Intranasal Midazolam Protocol in the Medication Appendix page 125.
HYPOVOLEMIC/NEUROGENIC SHOCK

Shock is defined as inadequate tissue perfusion and oxygenation resulting in abnormal tissue metabolism at the cellular level. Multiple causes of shock exist and include: hypovolemic (hemorrhage, burns, dehydration, anaphylaxis); cardiogenic (myocardial infarction, congestive heart failure, dysrhythmias); neurologic (spinal cord injuries) and septic (infection, poisoning). Common manifestations are decreased level of consciousness, peripheral vasoconstriction, decreased urine output, diaphoresis and decreased blood pressure. The patient with severe decompensated shock presents with hypotension and changes in mental status, eventually leading to confusion and death.

1. Lung sounds and respiratory status must be continuously monitored to avoid pulmonary edema.
2. Dopamine infusion should be considered after the 3rd fluid bolus.
SEPSIS

Sepsis is defined as a systemic inflammatory response syndrome (SIRS) in response to a documented infection. Untreated, systemic inflammatory response will lead to sepsis, severe sepsis, septic shock, refractory shock, and death. In the US each year, there are over 750,000 documented cases of sepsis, and more than 2/3 will present through Emergency Departments and EMS. It has been shown that by implementing early diagnosis and treatment of sepsis, mortality rates can be reduced by 25%. The goal of a dedicated EMS guideline for sepsis is to identify patients who meet established criteria, activate a hospital response, and begin early fluid resuscitation treatment.

**SEPSIS ALERT CRITERIA**

1) Patient age ≥ 18
2) Not pregnant
3) Suspected or documented infection
4) At least TWO of the SIRS (Systemic Inflammatory Response Syndrome) criteria:
   - Temperature greater than 38.3°C (100.4°F) or lower than 36°C (96.8°F)
   - Heart rate > 90
   - Respiratory rate > 20
   - Blood glucose >120mg/dl in the absence of diabetes

**EVIDENCE OF SEVERE SEPSIS?**
(HYPOPERFUSION OR ORGAN DYSFUNCTION)
- Systolic BP <90 or MAP<65 and one or more of following:
  - New mental status change
  - Areas of mottled skin
  - Capillary refill ≥3seconds

**INITIATE FLUID RESUSCITATION WITH**
- **NaCl or Lactated Ringers** at 30mL/kg
  (through IV ≥ 20G running w/o)

7/25/2012
## Mean Arterial Pressure

<table>
<thead>
<tr>
<th>Systolic Pressure</th>
<th>Diastolic Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>118</td>
</tr>
<tr>
<td>116</td>
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<td>44</td>
<td>42</td>
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<tr>
<td>40</td>
<td>38</td>
</tr>
</tbody>
</table>

### Mean Arterial Pressure

- **Definition:** Mean arterial pressure (MAP) is the average pressure in the arterial system during each cardiac cycle. It is calculated as:
  
  \[
  \text{MAP} = \frac{2 \times \text{Systolic Pressure} + \text{Diastolic Pressure}}{3}
  \]

### Notes

1. Lung sounds and respiratory status must be continuously monitored to avoid pulmonary edema.

---

**Medical Emergencies**

**December-2013**

**2014 Paramedic Guidelines**
~ TRAUMATIC EMERGENCIES ~

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TRIAGE DECISION SCHEME

When transport to a Level I or II trauma facility is indicated, but the ground transport time to that hospital is judged to be greater than 20 minutes, determination of the destination hospital shall be in accordance with medical control.

Measure vital signs and level of consciousness:

<table>
<thead>
<tr>
<th>Glasgow coma score</th>
<th>13 or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic blood pressure</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>&lt;10 or &gt; 29</td>
</tr>
</tbody>
</table>

YES TO ANY ↓ NO

TRANSPORT TO A LEVEL I OR II TRAUMA CENTER

ASSESS THE ANATOMY OF THE INJURY

- Gunshot wound to chest, head, neck, abdomen or groin
- Third degree burns > 15 % BSA or third degree burns to face or burns with airway involvement
- Evidence of spinal cord injury
- Amputation other than digits
- Two or more obvious proximal long bone fractures

YES ↓ NO

TRANSPORT TO A LEVEL I OR II TRAUMA CENTER

ASSESS THE MECHANISM OF THE INJURY*

- Mechanism of injury:
  - Falls > 15 feet
  - High speed impact
  - Ejection of patient from vehicle
  - Death of same car occupant
  - Pedestrian struck by vehicle > 20 MPH
  - Rollover
  - Significant vehicle deformity, i.e. bent steering wheel
- Other factors
  - Age < 5 or > 55
  - Known cardiac or respiratory disease
  - Penetrating injury to thorax, abdomen, neck, groin other than gunshot wounds

YES ↓ NO

ESTABLISH MEDICAL CONTROL

NOTES

* Mechanism of injury alone, is not criteria to initiate a trauma alert. Trauma alert activation requires physiologic signs and symptoms. See the TRAUMA APPENDIX E, page 194, for further information.

All EMS providers transporting trauma patients shall provide the hospital with a completed run report prior to departing from the hospital.
ABDOMINAL AND PELVIC TRAUMA

When unrecognized, abdominal injury is one of the major causes of death in the trauma patient. Death may occur from massive blood loss caused by blunt trauma, penetrating trauma, or both. Most commonly they are caused by motor vehicle crashes, blast injuries, falls, blows to the abdomen, abdominal compression, gunshot and stab wounds. Abdominal and pelvic injuries include musculoskeletal injuries and/or splenic, renal, hepatic, bladder, gastrointestinal, vascular, pancreatic and diaphragmatic injuries. A number of potentially lethal injuries can occur with significant abdominal and pelvic trauma. The most reliable indicator of intra-abdominal bleeding is the presence of shock from an unexplained source. In general, these patients may be managed under the multi-systems trauma guidelines.

**ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 5**

- Immobilize C-spine/Spinal column
- Evaluate and treat any life-threatening injuries
- Expose the patient
- **If Applicable,**
  - Control obvious bleeding
  - Cover eviscerations with sterile, non-adherent, saline moistened material
  - Stabilize any impaled objects

2ND IV ACCESS

NaCl or LR
Titrate to B/P > 90 mmHg

Does the patient still have signs of hemodynamic instability?

CONTINUE TO REASSESS
TREAT AS APPROPRIATE

ESTABLISH MEDICAL CONTROL

NOTES

1 Trauma alert activation should be initiated early, if necessary.

2 Transport should not be delayed to initiate IV access.

All EMS providers transporting trauma patients shall provide the receiving hospital with a completed patient care record prior to departing from the hospital, as required by the CT EMS Regulations.
AMPUTATION

The partial or complete severance of a digit or limb is most commonly the result of an industrial or machine operation accident. Amputations may or may not be accompanied by significant bleeding. Initially bleeding may be severe, but the body’s defense mechanism causes the vessels around the site to constrict, and blood loss may become minimal. Local trauma can break apart clots or interrupt the spasm and bleeding will reoccur. The longer the extremity is without oxygen the less likely it will be that the amputated portion can be reattached successfully. Cooling the amputated part, without freezing it, will reduce the metabolic rate and help prolong this critical time.

**ROUTINE PARAMEDIC CARE:**

**GENERAL PRACTICE, p 5.**

- Immobilize C-spine/Spinal column
- Evaluate and treat any life threatening injuries\(^1\)
- Expose the patient
- **If Applicable,**
  - Control obvious bleeding

**PREPARE PATIENT FOR IMMEDIATE TRANSPORT**

**MANAGEMENT OF INJURED TISSUE:**

- **Tissue still attached to body**
  - Clean wound surface with sterile NaCl
  - Gently return skin to normal position if possible
  - Control bleeding and bandage wound

- **Complete Amputation**
  - Clean wound surface with sterile NaCl
  - Control bleeding and bandage wound
  - Retrieve amputated part/tissue, if possible
  - Place the wrapped amputated part/tissue in a sealed plastic bag and then place that bag into a cool/cold water submersion

**CONSIDER PAIN MANAGEMENT/SEDATION**

Go to SEDATION GUIDELINE, p. 100

**ESTABLISH MEDICAL CONTROL**

**NOTES**

\(^1\) Trauma alert activation should be initiated early, if necessary.

\(^2\) Transport should not be delayed to initiate IV access.

All EMS providers transporting trauma patients shall provide the receiving hospital with a completed patient care record prior to departing from the hospital, as required by the CT EMS Regulations.
BURNS AND INHALATION INJURIES

A burn is caused by an interaction between energy (thermal, chemical, electrical, or radiation) and biological matter. Thermal burns (flames, scalds, steam, contact with hot substances or objects) account for the majority of burns. Chemical burns are caused by acids, alkalis and organic compounds (phenols, creosote, and petroleum products) commonly found in industrial and household environments. The severity of an electrical burn is related to the amount of current involved and the duration of the exposure. Direct contact burns occur when current is passed through tissue. This causes extensive tissue damage, necrosis and charring to occur. Often there is both entry and exit wounds. Arc injuries occur by arcing electricity between two contact points close together with the skin. Flash burns occur when a victim is too close to an open electrical source causing a thermal burn. Burn severity should be assessed and classified by degree. First-degree burns (superficial) involve only the epidermis and look red and painful to touch. Second degree burns (partial thickness) cause injury to both the epidermis and dermis. The skin presents as red, blistered or with open weeping wounds. The patient is often in a great deal of pain. Third degree burns (full thickness burns) cause injury to the epidermis, dermis and subcutaneous layers of tissue. The skin may look charred and leathery. Inhalation injury from smoke or toxic by-product inhalation (carbon monoxide, sulfur dioxide, ammonia, hydrogen chloride, cyanide) frequently accompany burn injuries. This is especially true if the injury occurred in a closed space and/or if the patient presents with facial burns, singed nasal hairs, singed beard/mustache, sooty or bloody sputum, difficulty breathing, hoarse speech, etc.

- Stop the burning process
- Determine type, size and degree of burn.
- Decontaminate patient if necessary.

**ROUTINE PARAMEDIC CARE:**
GENERAL PRACTICE, p 5

**THERMAL**

- REMOVE CLOTHING FROM AROUND THE BURN
- APPLY DRY, STERILE DRESSINGS TO WOUNDS

**ELECTRICAL**

- TREAT ARRHYTHMIAS APPROPRIATELY
- Go to SEDATION GUIDELINE, p. 100

**CHEMICAL**

- FLUSH WITH COPIOUS AMOUNTS OF WATER UNLESS CONTRAINDICATED

**RADIATION**

- EVALUATE FOR SAFETY CONSIDERATION AS A HAZMAT INCIDENT AND NOTIFY THE FIRE DEPT/POISON CONTROL OR CHEMTREC AS INDICATED

**NOTES**

* Monitor for signs of pulmonary edema and titrate IV accordingly.

1 Transport should not be delayed to initiate IV access

2 See Trauma Appendix, p. 202, for evaluation of burns.
HEAD TRAUMA

Head trauma is the leading cause of trauma deaths. Injury to the head occurs as blunt or penetrating trauma. They also have a history of being complicated by drugs and alcohol intoxication. Neck and spinal injuries often accompany head injuries. Signs and symptoms of head injuries include loss of consciousness, agitation, bradycardia, hypertension, seizures, paralysis and vomiting. As intracranial pressure (ICP) rises an abnormal respiratory pattern may develop. Cheyne–Stokes respiration occurs when the patient's respiratory pattern changes from slow shallow breaths to rapid deep ventilation, followed by a period of apnea in a repeating pattern. It is important to recognize signs of Cushing's Triad (rising blood pressure, change in respiratory pattern, and decrease in pulse) as a late sign of head injury. As ICP increases, the patient may develop decorticate posturing or decerebrate posturing. Basilar skull fractures may be evident from “raccoon eyes” (distinct ecchymotic area around each eye). Occipital skull fractures produce a “Battle’s sign” (distinct ecchymotic area behind the ear).

<table>
<thead>
<tr>
<th>ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 52.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Immobilize C-spine/Spinal column</td>
</tr>
<tr>
<td>- Evaluate and treat any life threatening injuries^1</td>
</tr>
<tr>
<td>- Expose the patient</td>
</tr>
<tr>
<td>- If Applicable,</td>
</tr>
<tr>
<td>- Control obvious bleeding</td>
</tr>
</tbody>
</table>

CONSIDER SEDATION ASSISTED INTUBATION GUIDELINE P 100

PREPARE PATIENT FOR IMMEDIATE TRANSPORT

ESTABLISH MEDICAL CONTROL

NOTES

1 Trauma alert activation should be initiated early, if necessary

2 Transport should not be delayed to initiate IV access. If B/P adequate, IV should be at KVO rate to avoid an increase in ICP.

All EMS providers transporting trauma patients shall provide the receiving hospital with a completed patient care record prior to departing from the hospital, as required by the CT EMS Regulations.
MULTI-SYSTEMS TRAUMA

Multi-system trauma is a leading cause of death and disability. Trauma victims require definitive surgical intervention to repair and/or stabilize their injuries. Successful management of trauma patients will require rapid assessment, stabilization and transportation to a trauma center. Many injuries are difficult to see and one must be careful not to focus in on obvious external injuries which may prove to be less serious than hidden internal injuries. These injuries may quickly lead to shock and death.

Does the patient still have signs of hemodynamic instability?

CONTINUE TO REASSESS
TREAT AS APPROPRIATE

ESTABLISH MEDICAL CONTROL

Prevent patient for immediate transport

2ND IV ACCESS
NaCl or LR
Titrate to B/P > 90 mmHg

Routine Paramedic Care:
General Practice, p 52.

- Immobilize C-spine/Spinal column
- Evaluate and treat any life threatening injuries
- Expose the patient
- If Applicable,
  - Control obvious bleeding
  - Cover eviscerations with sterile, non-adherent, saline moistened material
  - Stabilize any impaled objects

NOTES

Trauma alert activation should be initiated early, if necessary.

Transport should not be delayed to initiate IV access.

All EMS providers transporting trauma patients shall provide the receiving hospital with a completed patient care record prior to departing from the hospital, as required by the CT EMS Regulations.
MUSCULOSKELETAL TRAUMA

Musculoskeletal injuries can occur from blunt or penetrating trauma. This type of trauma, though quite common in most trauma patients, will rarely pose an immediate life threatening condition. Musculoskeletal trauma can be life threatening when it produces severe blood loss either externally or from internal bleeding into an extremity. The first priority in the management of patients with extremity injuries is the same as patients with injuries to other areas of the body: care for life threatening conditions first.

**Routine Paramedic Care:**

- Immobilize C-spine/Spinal column
- Evaluate and treat any life threatening injuries
- Expose the patient
- If Applicable,
  - Control obvious bleeding
  - Stabilize any impaled objects

**Prepare Patient for Immediate Transport**

- Assess neurovascular status (motor, sensory and circulation) distal to the injury before and after proper immobilization.
- If no palpable distal pulse, apply gentle traction along axis of the extremity distal to the injury until the distal pulse is palpable and immobilize in place. **THIS DOES NOT APPLY TO DISLOCATIONS.**
- Immobilize painful, swollen and/or deformed extremity injuries (e.g. fractures, sprains, strains, dislocations) involving joints, in the position found. Bones adjacent to each injured joint and the injured joint itself must be fully immobilized

**Management of Injured Extremity**

- Expose the patient
- If Applicable, - Control obvious bleeding
- Stabilize any impaled objects
- Immobilize painful, swollen and/or deformed extremity injuries (e.g. fractures, sprains, strains, dislocations) involving joints, in the position found. Bones adjacent to each injured joint and the injured joint itself must be fully immobilized

**Consider Pain Management/Sedation**

Go to Sedation Guideline, p 100.

**Consider 2nd IV Access**

NaCl or LR

**Establish Medical Control**

**Notes**

1 Trauma alert activation should be initiated early, if necessary.

2 Transport should not be delayed to initiate IV access.

All EMS providers transporting trauma patients shall provide the receiving hospital with a completed patient care record prior to departing from the hospital, as required by the CT EMS Regulations.
SELECTIVE SPINAL IMMobilIZATION**

Traditionally, prehospital providers have been taught that spinal injury is based solely on the mechanism and that spinal immobilization is required for any patient with a motion injury. However, there are now clear clinical guidelines for assessment of spine injuries and which ones may not require immobilization. Assessment for spinal immobilization must also include assessment of motor and sensory function, presence of pain or tenderness or distracting injury, and patient reliability as predictors of spinal cord injury. The primary focus of a prehospital provider should be to recognize the indications for spinal immobilization rather than to attempt to clear the spine clinically. Use of clinical judgment is of paramount importance. If in doubt, IMMobilze!

** Use of this guideline requires completion of the William W. Backus Hospital Medical Control, spinal assessment course.**
SELECTIVE SPINAL IMMobilization NOTES

^ Neurologic Deficit/Complaint:
It is possible to have significant injury to the spine without spine pain or tenderness on exam, even in a reliable patient. In these cases, some abnormality of motor or sensory function will be found if the patient and the exam are reliable. See Trauma Appendix E for information related to conducting the following tests.

Motor Function-Upper Extremities Includes:  Sensory Function-Upper Extremities Includes:
- Finger Abduction/Adduction  - Questioning regarding abnormal sensations
- Finger/Hand Extension  - Light Touch/Pain Sensation

Motor Function-Lower Extremities Includes:  Sensory Function-Lower Extremities Includes:
- Foot Plantar Flexion  - Questioning regarding abnormal sensations
- Foot/Great Toe Dorsiflexion  - Light Touch/Pain Sensation

1 Positive Mechanisms of Injury:
- Any mechanism that produced a violent impact to the head, neck, torso or pelvis (e.g., assault, entrapment in vehicle or structural collapse, etc.)
- Incidents producing sudden acceleration, deceleration, or lateral bending forces to the neck or torso (e.g., moderate-to high speed MVC, pedestrian struck, involvement in an explosion, etc.)
- High velocity MVA
- Ejection from a vehicle
- Pedestrian struck by vehicle traveling > 20 MPH
- Fall from >15ft or in which the patient is elderly
- Diving accidents
- Starred windshield
- Penetrating trauma to head, chest, abdomen, neck, groin or near the spine.
- Fall with injury above the clavicles
- Any mechanism causing a head (brain) injury
- Any patient meeting CODE RED criteria!

2 Distracting Injuries:
- Any injury that may have the potential to impair the patient’s ability to appreciate other injuries. Examples of distracting injuries include: long bone fracture, visceral injury, large lacerations, degloving injury, crush injury, large burns or any other injury producing acute functional impairment.

3 Inability to Communicate:
- Any patient who, for reasons not specified above, cannot clearly communicate so as to actively participate in their assessment. Examples include: the speech or hearing impaired, those who speak a foreign language and small children, dementia, retardation or known psychotic state.
SUSPECTED SPINAL COLUMN / CORD INJURIES

Spinal cord injury may be the result of blunt trauma, penetrating trauma, compression forces, and abnormal motion. Spinal cord injuries are classified as complete and incomplete and may be the result of pressure, contusion or laceration of the cord. Management of the patient with spinal column/cord injuries includes assessment of the patient’s airway, breathing and circulation. Patients who have a spinal cord injury may be difficult to assess as they may not present with pain or other signs and symptoms of injury. Therefore, treatment (spinal immobilization) is recommended based upon reliability of the patient, mechanism of injury, motor/sensory exams and/or the presence of a painful distracting injury.

**NOTES**

1. Trauma alert activation should be initiated, if necessary
2. Transport should not be delayed to initiate IV access.

All EMS providers transporting trauma patients shall provide the hospital with a completed patient care report prior to departing from the hospital as required by CT EMS Regulations.
**THORACIC TRAUMA**

Chest injuries are the result of blunt trauma, penetrating trauma or both. Commonly they are a result of motor vehicle crashes, falls from heights, blow to the chest, chest compression, gunshot and stab wounds. Thoracic injuries include skeletal, pulmonary, cardiac, great vessels and/or diaphragm. A number of potentially lethal injuries can occur with significant chest trauma. These include flail chest, hemothorax, pneumothorax, myocardial and pulmonary contusions, sucking chest wound, cardiac tamponade, aortic rupture and/or diaphragmatic rupture. In general these cases are managed under the multi-system trauma guideline.

### PREPARE PATIENT FOR IMMEDIATE TRANSPORT

- Immobilize C-spine/Spinal column
- Evaluate and treat any life threatening injuries\(^1\)
- Expose the patient
- **If Applicable,**
  - Control obvious bleeding
  - Cover eviscerations with sterile, non-adherent, saline moistened material
  - Stabilize any impaled objects

### ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 5\(^2\).

- 2\(^{nd}\) IV ACCESS
  - NaCl or LR
  - Titrate to B/P > 90 mmHg

### ASSESS FOR SIGNS OF:

- JVD
- Tracheal deviation
- Tachypnea
- Dyspnea
- Chest crepitus
- Cyanosis
- Extreme anxiety
- Decreased or absent breath sounds

### FLAIL CHEST

- Splint the flail segment in the inward position with simple hand pressure or with bulky dressings or towels and tape. If the patient has difficult respiration, assist with bag-valve-mask ventilation and consider endotracheal intubation.

### SUCKING CHEST WOUND

- Apply an occlusive dressing sealing three sides. Monitor the patient closely for signs of a tension pneumothorax

### TENSION PNEUMOTHORAX

- If present following the closure of a sucking chest wound, release the **OCCLUSIVE DRESSING** temporarily and then reseal. If indicated, perform a **NEEDLE DECOMPRESSION** on effected side of chest. This is an **off-line** medical control intervention. See **APPENDIX A** for more information.

### ESTABLISH MEDICAL CONTROL

**NOTES**

\(^1\) Trauma alert activation should be initiated, if necessary.

\(^2\) Transport should not be delayed to initiate IV access.

All EMS providers transporting trauma patients shall provide the receiving hospital with a completed patient care record prior to departing from the hospital, as required by the CT EMS Regulations.
TRAUMATIC CARDIOPULMONARY ARREST

In the traumatic arrest patient, rapid transport is a critical element to patient survivability. Successful management of these patients will require rapid assessment, stabilization and transportation. Patients found in traumatic cardiac arrest by first responding personnel have little probability of survival. Discretion should be used when initiating resuscitation interventions. Aggressive resuscitation should be initiated where the patient showed witnessed signs of life shortly before EMS arrival or when exceptional circumstances exist (e.g. penetrating trauma, hypothermia, etc.). Patients less than 18 years old require full ALS resuscitation and a code red response.

**Rapid Scene Survey:** Is there evidence the patient should not be resuscitated (i.e. obvious signs of death)?

1. AND/OR
2. Is the patient > 18 years of age?

**Manage Arrhythmia According to Appropriate Guideline**

**Establish Medical Control**

ANTICIPATE AN ORDER FOR THE TERMINATION OF EFFORTS

**Return of Pulse?**

<table>
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<th>YES</th>
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<tbody>
<tr>
<td>Establish Medical Control</td>
<td>Request Trauma Alert</td>
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**NOTES**

1. **Signs of death include:** Body decomposition, decapitation, transection of torso, incineration, rigor mortis with lividity.

2. **Consider the possible causes of asystole/PEA:** hypovolemia, hypoxia, acidosis, hyperkalemia, hypokalemia, hypothermia, drug overdose, cardiac tamponade, pneumothorax, acute myocardial infarction and pulmonary embolus. Not all of these would cause a rapid conversion to **asystole/PEA**, but they may occur as a result of a deteriorating condition.

**Transcutaneous Pacing** must be initiated early -- as soon as possible after the presentation of **asystole**. Routine pacing for **asystolic/PEA** cardiac arrest is not acceptable.
~ PEDIATRIC EMERGENCIES ~

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NEWBORN RESUSCITATION

The active term infant requires no intervention during transport. Allow the mother to hold the baby during transport. It is essential to prevent heat loss in newborns. It is important to rapidly dry the infant, cover the head, and wrap the baby in warm blankets. Newborn resuscitation refers to the series of interventions used to stimulate spontaneous breathing. When the baby remains depressed after drying, warming, and clearing the airway, begin resuscitation. The typical newborn response to hypoxia is apnea and bradycardia. Therefore, the primary treatment is to reverse hypoxia with immediate BVM ventilation.

ROUTINE PARAMEDIC CARE:
GENERAL PRACTICE, p 5.

APGAR at 1 and 5 minutes
ASSESS and SUPPORT
- Temperature (warm and dry)
- Airway (position and suction)
- Breathing (stimulate to cry)
- Circulation (heart rate and color)

ASSESS BREATHING

ABSENT OR IRREGULAR?

NORMAL

BVM VENTILATION WITH 100% O2 AT 40-60 BPM

ASESS HEART RATE < 100 BPM?

YES

NO

PERFORM
BVM VENTILATION WITH 100% O2 AT 40-60 BPM
If HR remains < 60
Intubate and continue ventilations as above.
If HR remains < 60
Begin chest compressions at 100/min

HEART RATE > 60

YES

NO

ESTABLISH IV ACCESS AND ADMINISTER
EPINEPHRINE
0.01 mg/kg (1:10,000)
IV or IO
Repeat every 3 minutes at
0.01 mg/kg (1:10,000)

TRANSPORT AND REASSESS
TREAT AS APPROPRIATE

TRANSPORT AND REASSESS
TREAT AS APPROPRIATE

ESTABLISH MEDICAL CONTROL

NOTES

1 See APGAR scoring system, Pediatric Appendix F, page 206.
2 Gentle rubbing of feet or back, no slapping.
PEDIATRIC ALLERGIC REACTION

An allergic reaction is a hypersensitivity to an antigen. It is usually non-life threatening, merely uncomfortable for the patient. The patient is hemodynamically stable and complains of minor to moderate skin manifestations or mild wheezing.

**ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 51.**

Is the patient severely symptomatic?²

NO →

Is the patient wheezing?

NO →

Hives only?

→

**DIPHENHYDRAMINE**

1 mg/kg IVP or IM if no IV

→

ESTABLISH MEDICAL CONTROL

YES →

**ADMINISTER**

**ALBUTEROL**

2.5 mg Nebulizer

AND

**DIPHENHYDRAMINE**

1 mg/kg IV, or IM

→

Is wheezing still present or did symptoms worsen?

NO →

→

**ADMINISTER**

**EPINEPHRINE 1:1,000**

0.01 mg/kg SQ

YES →

ESTABLISH MEDICAL CONTROL

**NOTES**

¹ Do not delay treatment to establish an IV.

² Symptomatic patients may exhibit signs and symptoms of shock, feeling of impending doom, severe shortness of breath, throat constriction, anxious/agitated, difficulty swallowing, speaking, etc.
PEDiatric ALTERED MENTAL STATUS

Altered mental status in children covers a range of behaviors and can be subtle. Coma is not difficult to recognize, but irritability, lethargy, changes in feeding or sleeping habits, and other subtle changes can all indicate a process impairing the normal functioning of the child’s central nervous system. History from the caregiver is critical. The common causes of pediatric coma are injury, shock, metabolic disorders, ingestion and/or CNS infections. Pediatric shock, if suspected, should be treated according to the pediatric shock guideline. Likewise, pediatric head trauma, if suspected as the cause for altered mental status, should be treated according to the pediatric trauma guideline. Remember that some forms of injury such as those associated with “shaken baby syndrome”, can cause CNS trauma without external evidence of injury.

**Routine Paramedic Care:**
General Practice, p 5.

- **Check Blood Glucose Level**
- **Consider Etiology**

**Hypoglycemia**
- If BGL is <60
  - **Administer:** Dextrose 25%²
  - 1 gm/kg IVP
  - OR
  - If no IV access, **Administer:** Glucagon 1 mg IM

**Overdose?**
- **Naloxone¹**
  - 0.1 mg/kg IVP
  - or intranasal
  - **MAX DOSE:** 2 mg

**Fever? Hypoxia?**
- Maintain airway as appropriate.
- If seizure develops go to **Pediatric Seizure, p 72.**

**Seizure?**
- **Go to Pediatric Seizure, p 72.**

**Shock?**
- **Go to Pedi Shock, p 73.**

**Trauma?**
- **Perform Cervical Immobilization.**
- **Go to Pedi Trauma, p 79.**

**Transport and Reassess**
- **Continue Routine Paramedic Care**
- **Treat as Appropriate**
- **Establish Medical Control**

**Notes**

¹ Consider if narcotic overdose is suspected or with signs of respiratory insufficiency. Refer to the guideline on intranasal naloxone administration on page 123.

² For children 1 year old or less use Dextrose 25%. In children greater than 1 year of age use Dextrose 50%.
**PEDIATRIC ANAPHYLAXIS**

Anaphylaxis is an acute, generalized, and severe antigen-antibody reaction that can become fatal. Anaphylaxis may present as a mild to severe response. Management is based upon the severity of the reaction. There are multiple causes of anaphylaxis including antibiotics, vaccines, insect bites, contrast dyes, latex and food sensitivities. Most reactions occur within thirty minutes following antigen exposure, although the onset of symptoms varies from several seconds to hours. Severe anaphylaxis manifests with hypotension or impending airway obstruction with wheezing and/or stridor with accessory respiratory muscle use.

<table>
<thead>
<tr>
<th>ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 5.</th>
<th>TITRATE IV to B/P &gt;90 mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADMINISTER EPINEPHRINE 1:1,000 0.01 mg/kg IM in lateral thigh (Max 0.3mg) AND DIPHENHYDRAMINE 1 mg/kg IV, IO slowly, or IM</td>
<td></td>
</tr>
<tr>
<td>Is wheezing present? NO YES ESTABLISH MEDICAL CONTROL</td>
<td></td>
</tr>
<tr>
<td>ADMINISTER ALBUTEROL 2.5 mg via Nebulizer</td>
<td></td>
</tr>
<tr>
<td>Is wheezing still present or did symptoms worsen? NO YES</td>
<td></td>
</tr>
<tr>
<td>ADMINISTER EPINEPHRINE 1:10,000 0.01 mg/kg slow IVP MAX DOSE: 0.1 mg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>¹ Do not delay treatment to establish an IV.</td>
</tr>
</tbody>
</table>
**PEDIATRIC ASTHMA**

Asthma is the most common chronic disease in children. Asthma is a lower airway disease in which an inflammatory reaction leads to bronchoconstriction, mucosal edema, and profuse secretions. These factors cause severe airflow obstruction. Clinically, children having an asthma attack will show different degrees of tachypnea, tachycardia, increased work of breathing, and wheezing on exhalation. The asthmatic complaining of shortness of breath, but without wheezing on auscultation, may have too much airway obstruction to wheeze. The following signs may suggest severe bronchospasm: altered appearance, exhaustion, inability to recline, interrupted speech, retractions and decreased air movement.

**ROUTE PARAMEDIC CARE:**
*GENERAL PRACTICE, p 5.*

**FOLLOW PEDIATRIC RESPIRATORY DISTRESS GUIDELINE, p 70**

**ASSESS DEGREE OF RESPIRATORY DISTRESS**

- **MILD**
  - **CONSIDER ALBUTEROL**
  - 2.5 mg in 3 cc NS Aerosol
  - **ESTABLISH MEDICAL CONTROL**

- **MODERATE**
  - **ADMINISTER ALBUTEROL**
  - 2.5 mg in 3 cc NS Aerosol
  - If wheezing persists, repeat ALBUTEROL
  - 2.5 mg in 3 cc NS Aerosol
  - **ESTABLISH MEDICAL CONTROL**

- **SEVERE**
  - **ADMINISTER ALBUTEROL**
  - 2.5 mg in 3 cc NS Aerosol
  - **EPINEPHRINE 1:1,000**
  - 0.01 mg/kg SQ
  - MAX DOSE: 0.3 mg SQ
  - If wheezing persists, repeat ALBUTEROL
  - 2.5 mg in 3 cc NS Aerosol
  - **ESTABLISH MEDICAL CONTROL**
PEDIATRIC BRADYCARDIA

Bradycardia in children is rare and considered to be a pre-arrest rhythm with an ominous prognosis. Pathologically slow heart rates usually result from hypoxemia, acidosis, hypothermia and/or late shock. Bradycardia may be a late finding in cases of raised intracranial pressure due to head trauma, infection and/or previous neurosurgery. Rarely, ingestion can cause bradycardia. Prehospital treatment is primarily focused on airway management. Heart rates that are normal in older patients, may be bradycardic in children.

**Routine Paramedic Care:**

**General Practice, p 5.**

Maintain and secure the airway as appropriate

Cardiopulmonary Compromise?
- Hypotension
- Acutely altered mental status
- Signs of shock

**Heart Rate < 60?**

YES NO

**Transport and Reassess**

*Continue Routine Paramedic Care*

* Treat as appropriate*

**Establish Medical Control**

Epinephrine

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

May be repeated every 3-5 min.

Atropine

0.02 mg/kg

Min dose: 0.1 mg

Max dose: 0.5 mg (child)

Max dose: 1.0 mg (adolescent)

May be repeated one time

Consider

Transcutaneous Pacing

Establish Medical Control

NOTES

1 Give atropine first ONLY for bradycardia due to suspected vagal response or AV block.

Consider and treat possible causes: hypoxia, hypothermia, head injury, heart block, toxins, poisonings, drugs, etc.
CROUP OR EPIGLOTTITIS

Croup is a viral disease causing inflammation, edema, and narrowing of the larynx, trachea, and bronchioles. It usually affects infants and toddlers. Most children with croup have had several days of cold symptoms followed by development of a barking or “seal” cough, stridor, fever and various levels of respiratory distress. Croup develops over days rather than hours. Epiglottitis is a bacterial infection causing inflammation of the epiglottis. Unlike croup, this infection progresses rapidly with severe respiratory compromise occurring within hours. Stridor may be present but there may not be the barking cough. Since HIB vaccine in infants, epiglottitis is now rare.

**Routine Paramedic Care:**
General Practice, p 5.

**History and respiratory assessment:**
- Presence of stridor
- Respiratory rate and effort
- Drooling or mouth breathing
- Degree of cyanosis
- Increased skin temperature

**Keep patient calm and upright**
In a position of comfort

**Administer**
Humidified 100% Oxygen via mask

**Croup**

**Epinephrine 1:1,000 5mg** (2.5 mg < age 1)
with 2.5-3 ml NaCl nebulized if respiratory distress or stridor at rest

**Rapid transport**
Reassess
Establish medical control

**Epiglottitis**

**Rapid transport**
Reassess
Establish medical control

**If respiratory arrest from obstruction occurs:**
1. Attempt ventilation with pediatric BVM
2. If unsuccessful, attempt ventilation with an adult BVM
3. If ventilation is still unsuccessful, make ONE attempt at endotracheal intubation with a tube smaller than normal
4. Contact medical control
   - Possible order may include Needle Cricothyrotomy

**Notes**

1 Do not attempt to establish an IV. Transport with the parent
2 Mask should be held by mother or significant other 4 inches from child’s face, but only if well tolerated by the child.
3 May substitute Albuterol 2.5 mg via nebulizer if epinephrine unavailable or patient is in minimal-mild distress.
**PEDiatric Respiratory distress**

Respiratory distress can be a life-threatening emergency. It requires immediate assessment and management. The clinical manifestations of respiratory distress in pediatric patients are similar regardless of the etiology. The smaller tracheal diameter allows the airway to be easily compromised. Respiratory distress may occur as a result of upper airway obstruction (croup, foreign body, epiglottitis, congenital anomalies, edema, and allergic reactions) or from lower respiratory airway obstruction (asthma, bronchiolitis). Rapid assessment is essential. Stridor and hoarseness are signs of an upper airway obstruction while wheezing is the hallmark sign for lower airway obstruction.

**Routine Paramedic Care:**
**General Practice,** p. 5.

- **Determine** approximate weight of the patient. If more than 50 kg (110 lb.) treat as an adult.

- **Ensure** airway patency and assess respiratory rate and effort.
- **Look For:**
  - Accessory muscle use, stridor, retractions, nasal flaring, and/or noisy breathing

- **Administer** Oxygen in the least irritating manner possible.

- **Transport**
  - In the most comfortable position
  - See guidelines for Croup/Epiglottitis, asthma, or obstructed airway as indicated.

- If the patient requires ventilatory support:
  - **Do not** over extend the neck
  - Hyperoxygenate with a BVM and 100% O2.
  - Perform endotracheal intubation as appropriate.

- **Establish Medical Control**

**Notes**

1. Early transport of the pediatric patient is critical.
2. Croup/Epiglottitis - p. 69.
   - Asthma - p. 68.
   - Obstructed airway - p. 71.
3. Limit to 2 attempts at intubation unless otherwise directed by medical control.
PEDIATRIC OBSTRUCTED AIRWAY

Foreign body aspiration may cause mechanical obstruction anywhere in the airway, from the pharynx to a bronchus. A typical history of foreign body aspiration is the sudden onset of coughing, choking, gagging, and shortness of breath in a previously well child without a fever.

Can the child cry, cough or speak?

YES  NO

KEEP PATIENT CALM AND UPRIGHT¹
In a position of comfort

ADMINISTER
100% Oxygen via mask²

RAPID TRANSPORT
REASSESS
ESTABLISH MEDICAL CONTROL

If the patient is conscious, but totally obstructed,
PERFORM
BLS airway clearing maneuvers appropriate to age.
ATTEMPT
Visualization with laryngoscope and attempt to remove foreign body with Magill forceps.

RAPID TRANSPORT

ROUTINE PARAMEDIC CARE:
GENERAL PRACTICE, p 5.

IS THE PATIENT UNCONSCIOUS?

YES  NO

ESTABLISH MEDICAL CONTROL
ANTICIPATE ORDER FOR:
NEEDLE CRICOTHYROTOMY
APPENDIX A, p 112.

CONTINUE
BLS AIRWAY CLEARING MANEUVERS
ESTABLISH MEDICAL CONTROL

NOTES

¹ Do not attempt to establish an IV. Transport with the parent.

² Mask should be held by mother or significant other 4 inches from child’s face, but only if well tolerated by the child.

Do not perform blind finger sweeps.
**PEDIATRIC SEIZURES**

A seizure is a temporary alteration in behavior due to the abnormal electrical discharge of one or more groups of neurons in the brain. Seizures can present in several different forms: generalized or grand mal, focal motor and status epilepticus. The most common cause of seizures is idiopathic epilepsy. However, there are several other causes: hypoglycemia, head trauma, vascular disorders, overdose, infection, fever, electrolyte abnormalities, hypoxia, toxic exposures, medication withdrawal and structural brain disorders such as tumors. The seizure may be followed by a postictal state or complete coma depending upon cause. Treatment should be initiated based upon history and clinical presentation.

**Routine Paramedic Care:**

- If trauma is suspected perform cervical/spinal immobilization. Go to trauma guideline.
- Check blood glucose level.
- Is BGL < 60 mg/dl?
  - Yes
    - Consider other causes and treat as appropriate.
    - Is seizure activity suppressed?
      - No
        - Establish medical control.
      - Yes
        - Diazepam $^2$
          - 0.25 mg/kg slow IVP
          - Max dose: 10 mg
          - Or
          - Ativan
          - 0.1 mg/kg IVP or IM
            - If no IV access, Versed
            - 0.1 mg/kg IM
              - Max dose: 3 mg or appropriate weight based intranasal dose $^3$
                - Is seizure activity suppressed?
                  - No
                    - Establish medical control.
                  - Yes
                    - Transport and reassess. Continue routine paramedic care. Treat as appropriate. Establish medical control.
  - No
    - Wait 5 minutes. RECHECK BGL.
    - If still < 60 mg/dl, repeat D25 or Glucagon.

**Notes**

1. Do not delay transport to start an IV.
2. Be prepared to assist ventilations and/or secure airway.
3. To determine the appropriate weight based dose of versed review the Intranasal Midazolam Protocol in the Medication appendix page 125.
4. For children 1 year old or less use D25. In children greater than 1 year of age use D50.
**PEDIATRIC SHOCK**

The most common cause of shock in children is hypovolemia. This can be due to: vomiting, diarrhea, hyperthermia, hemorrhage, decreased intake, or fluid shifts out of the vascular space. Regardless of etiology, treatment should be directed at rapid fluid replacement. Severe shock is present if the child exhibits a decreased level of consciousness, weak and thready pulses, and/or no palpable blood pressure. Children may develop significant sinus tachycardias in the face of dehydration, but if the heart rate is above 220 bpm, refer to the pediatric supraventricular tachycardia guideline.

---

**NOTES**

1. Signs of shock include: altered level of consciousness, tachycardia, hypotension, pallor, cyanosis, diaphoresis, etc.

   **Remember:**

   Hypotension is a LATE sign of shock.

2. Fluid boluses may be administered without signs of pulmonary edema. There is no maximum amount of fluid to be administered unless pulmonary edema develops or fluid resuscitation is unsuccessful.

3. B/P is calculated: 70 + (age in years x 2)
   (e.g. a 3 year old’s B/P should be titrated to 76. 70 + (3x2) = 76)
PEDIATRIC ARREST: ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY

Cardiopulmonary arrest in infants and children is usually the end result of deterioration in respiratory and circulatory function. Injury, including child abuse, is the leading cause of death in children between 1-16 years. Other etiologies include, but are not limited to: severe dehydration, SIDS, congenital anomalies, airway obstruction, bacterial and/or viral infections, sepsis, asthma, hypothermia and drug overdose.

**NOTES**

1. **Consider the possible causes of Asystole/PEA**: hypovolemia, hypoxia, acidosis, hyperkalemia, hypokalemia, hypothermia, drug overdose, cardiac tamponade, pneumothorax and pulmonary embolus.

2. **Transcutaneous pacing** is not indicated for PEA.
PEDIATRIC ARREST: VENTRICULAR FIBRILLATION & PULSELESS VENTRICULAR TACHYCARDIA

Cardiopulmonary arrest as manifested by ventricular fibrillation or pulseless ventricular tachycardia, is less common in infants and children. It is usually the end result of deterioration in respiratory and circulatory function. Common causes can be sepsis, foreign body aspiration, SIDS, traumatic hemorrhages and meningitis.

ROUTINE PARAMEDIC CARE: GENERAL PRACTICE, p 5.

Assess for and shock VF and pulseless VT up to three times: 2 J/kg, 4 J/kg, 4 J/kg or biphasic equivalent.

RHYTHM AFTER FIRST SHOCKS?

- SECURE DEFINITIVE AIRWAY
- ESTABLISH VASCULAR ACCESS NaCl

PERSISTENT OR RECURRENT VF/VT

EPINEPHRINE²
IV/IO: 0.01 mg/kg (1:10,000)
ET: 0.1 mg/kg (1:1000)

DEFIBRILLATION 4 J/kg¹

ADMINISTER LIDOCAINE
1 mg/kg IVP
May repeat after 5 min
0.5 mg/kg IVP or IO
Max dose: 3 mg/kg
Or
ADMINISTER AMIODORONE
5 mg/kg IVP or IO

DEFIBRILLATION 4 J/kg¹

EPINEPHRINE²
IV/IO: 0.01 mg/kg (1:10,000)
ET: 0.1 mg/kg (1:1000)
May be repeated every 3-5 min.

ESTABLISH MEDICAL CONTROL

ASYSTOLE OR PULSELESS ELECTRICAL ACTIVITY
GO TO ASYSTOLE/PEA GUIDELINE, p 74.

RETURN OF SPONTANEOUS CIRCULATION
GO TO POST-ARREST GUIDELINE, p 76.

NOTES

¹ DEFIBRILLATION should be performed within 30 – 60 seconds after each medication administration.

² When IV/IO access is unobtainable, epinephrine should be given via endotracheal tube. Medications given via ETT must be given at 2-2.5 times the IVP dose except epi 1:1,000 because it is already 10 times the IV dose. ETT meds should be administered via atomizer whenever possible.

Pattern should be drug-shock, drug-shock, drug-shock, etc.
PEDIATRIC POST ARREST TREATMENT

CONTINUE:
- Airway management
- Cardiac/SpO2 Monitoring
- Vital signs

TREAT ARRHYTHMIAS APPROPRIATELY

Signs of shock?¹

YES → ADMINISTER FLUID BOLUSES²
20 ml/kg NaCl or LR
MAY REPEAT UP TO 3

If no change after 3 boluses:
ADMINISTER DOPAMINE
5–20 mcg/kg/min
titrated as necessary to maintain age appropriate B/P³

ESTABLISH MEDICAL CONTROL

NO → CONSIDER FLUID BOLUSES²
20 ml/kg NaCl or LR
titrated as necessary to maintain age appropriate B/P³

REASSESS AND TREAT APPROPRIATELY
ESTABLISH MEDICAL CONTROL

¹ Signs of shock include: tachycardia, hypotension, pallor, cyanosis, diaphoresis, etc.

Remember: Hypotension is a LATE sign of shock.

² Fluid boluses may be administered without signs of pulmonary edema. There is no maximum amount of fluid to be administered unless pulmonary edema develops or fluid resuscitation is unsuccessful.

³ B/P is calculated: 70 + (age in years x 2) For example, a 3 year old’s B/P should be titrated to 76. 70 + (3x2)= 76.

NOTES
PEDIATRIC TACHYCARDIA WITH ADEQUATE PERFUSION

Supraventricular tachycardia is the most common dysrhythmia producing cardiovascular instability during infancy, and it can occur throughout the pediatric years. However, it is critical that the rhythm be differentiated from sinus tachycardia, which is seen more often. Some common causes of sinus tachycardia are dehydration, shock, hyperthermia, anxiety, pain and/or fear. Treatment should be directed towards underlying causes. SVT in infants often produces a heart rate of 240 beats per minute. Ventricular tachycardia (QRS >0.08 sec) is uncommon in children. Pediatric tachycardia, with a narrow QRS (<0.08 sec) rarely requires treatment under 220 beats per minute. If the heart rate is greater than 150 beats per minute and the QRS is wide (> 0.08 sec) consider ventricular tachycardia as the cause and treat appropriately.

**WHAT IS THE RATE AND QRS DURATION?**

**QRS <0.08 sec**

**QRS >0.08 sec**

**Supraventricular Tachycardia**

**Vagal Maneuvers**

If no change:

**Administer Adenosine**

0.1 mg/kg rapid IVP

follow with 10 cc NaCl flush

Max first dose: 6 mg

If no change:

**Administer Adenosine**

0.2 mg/kg rapid IVP

follow with 10 cc NaCl flush

Max dose: 12 mg

Prepare for Cardioversion

0.5-1 J/kg

Establish Medical Control

**Sinus Tachycardia**

Identify and treat possible causes:

- Fever
- Pain/Anxiety
- Hypoxia
- Hypovolemia
- Drug ingestion
- Pneumothorax

Transport

Reassess and treat as appropriate

Establish Medical Control

**Ventricular Tachycardia**

**Administer Lidocaine**

1 mg/kg IVP

May repeat after 5 min

0.5 mg/kg IVP or IO

Max dose: 3 MG/KG

Or

**Administer Amiodarone**

5 mg/kg IV or IO over 20 min.

If no change:

Prepare for Cardioversion

0.5-1 J/kg

Establish Medical Control

**NOTES**

1 If < 6 years old, apply cold compress to mid face. If > 6 years old, have child blow through an occluded straw or tube, i.e. O2 tubing, ET tube, etc. See Appendix D, page 183, for more on vagal maneuvers.

2 To administer Amiodarone dilute 150 mg in 100 cc of D5W and run in over 20 minutes.
PEDIATRIC TACHYCARDIA WITH POOR PERFUSION

Supraventricular tachycardia is the most common dysrhythmia producing cardiovascular instability during infancy, and it can occur throughout the pediatric years. However, it is critical that the rhythm be differentiated from sinus tachycardia, which is seen more often. Some common causes of sinus tachycardia are dehydration, shock, hyperthermia, anxiety, pain and/or fear. Treatment should be directed towards underlying causes. SVT in infants often produces a heart rate of 240 beats per minute. Ventricular tachycardia (QRS >0.08 sec) is uncommon in children. Pediatric tachycardia, with a narrow QRS (<0.08 sec) rarely requires treatment under 220 beats per minute. If the heart rate is greater than 150 beats per minute and the QRS is wide (> 0.08 sec) consider ventricular tachycardia as the cause and treat appropriately.

**ROUTINE PARAMEDIC CARE:**

**GENERAL PRACTICE, p 5.**

- **Pulse Present?**
  - **YES** → **GO TO PEA GUIDELINE, p 75**
  - **NO** → **What is the rate and QRS duration?**
    - **QRS <0.09 sec**
      - **SUPRAVENTRICULAR TACHYCARDIA**
        - **Evaluate rhythm**
          - **SINUS TACHYCARDIA**
            - Identify and treat possible causes:
              - Fever
              - Pain/Anxiety
              - Hypoxia
              - Hypovolemia
              - Drug ingestion
              - Pneumothorax
            - **Transport**
              - Reassess and treat as appropriate
              - Establish medical control
      - **VENTRICULAR TACHYCARDIA**
        - **Prepare for cardioversion**
          - **0.5-1 J/kg**
            - (or clinically equivalent biphasic energy dose)
              - OR-
                - Administer**1**
                  - Adenosine
                    - 0.1 mg/kg rapid IVP
                      - follow with 10 cc NaCl flush
                      - Max first dose: 6 mg
                    - If no change**2:**
                      - Cardioversion
                        - 2.0 J/kg
                          - (or clinically equivalent biphasic energy dose)
                            - OR-
                              - Administer
                                - Lidocaine
                                  - 1 mg/kg IVP
                                    - May repeat after 5 min
                                    - 0.5 mg/kg IVP or IO
                                    - Max dose: 3 mg/kg
                                    - Or
                                      - Administer
                                        - Amiodarone**3**
                                          - 5 mg/kg IV or IO over 20 min.
                                            - Establish medical control
          - OR-
            - Administer
              - Amiodarone
                - 3.5 mg/kg IV or IO over 20 min.
                  - Establish medical control
              - Max first dose: 6 mg

- **QRS >0.09 sec**
  - **SUPRAVENTRICULAR TACHYCARDIA**
    - **Evaluate rhythm**
      - **SINUS TACHYCARDIA**
        - Identify and treat possible causes:
          - Fever
          - Pain/Anxiety
          - Hypoxia
          - Hypovolemia
          - Drug ingestion
          - Pneumothorax
        - **Transport**
          - Reassess and treat as appropriate
          - Establish medical control

**NOTES**

1. May use adenosine if IV access is readily available.

2. If cardioversion was initial therapy, then continue. If adenosine was the initial therapy, repeat adenosine.

3. To administer Amiodarone dilute 150 mg in 100 cc of D5W and run in over 20 minutes.
PEDIATRIC TRAUMA AND TRAUMATIC ARREST

Injury is the most common cause of death in the pediatric population. Blunt injuries are more common than penetrating injuries. The death rate from traumatic injury in children is twice that of the adult patient. To resuscitate a pediatric traumatic arrest victim, aggressive management and rapid transport is required. The more time spent in the field, the less likely the child is to survive.

**Routine Paramedic Care:**
General Practice, p. 5.

- **Immobilize C-spine**

- **Pulses present?**
  - Yes
  - No

- **Treat all life-threatening problems as they are identified**

- **Establish IV Access**
  - LR @ w/o
  - AND/OR
  - Administer
  - Fluid Boluses
  - 20 ml/kg

- **Titrate as necessary to maintain age appropriate B/P**

**Transport**
Reassess and treat as appropriate
Establish Medical Control

**Notes**

1. 2 large bore IVs should be started. Titrate IV infusion rate to patient’s hemodynamic status depending on age, size, and weight of the child. If IV access is not readily available and the patient is in cardiac arrest establish an intraosseous infusion.

2. B/P is calculated: 70 + (age in years x 2) For example, a 3 year old’s B/P should be titrated to 76.
   
   $70 + (3 \times 2) = 76$
OBSTETRICAL EMERGENCIES

Obstetrical emergencies include, but are not limited to, the following: abortion (spontaneous, threatened, inevitable, incomplete, criminal, therapeutic, and elective), trauma, ectopic pregnancy, eclampsia, abnormal deliveries (breech, prolapsed cord, limb presentation, and multiple births), bleeding during any trimester, complications of labor and delivery (antepartum hemorrhage, abruptio placenta, placenta previa, uterine rupture, uterine inversion, toxemia, pulmonary embolism, and post-partum hemorrhage.) Pre-existing medical conditions can lead to obstetrical complications. The primary concerns are diabetes, hypertension, heart disease, and substance abuse. All obstetrical emergencies resulting in bleeding disorders should be managed as though the patient is at risk for hypovolemic shock and should be considered an acute emergency requiring efficient management and transport per the shock guideline (excluding MAST/PASG.) Vaginal bleeding at any time during pregnancy is not normal and is always of concern. The exact etiology cannot be determined in the field. However, onset of bleeding may provide clues to the etiology. For example, bleeding early in the pregnancy may indicate ectopic pregnancy or spontaneous abortion. Third trimester bleeding may be the result of abruptio placentae or placenta previa or may result from trauma. The amount of visualized blood loss is not a reliable indicator of the amount of blood actually lost. Abruptio placenta usually occurs during the third trimester and is a partial or complete separation of the placenta from the wall of the uterus. Blood loss may range from minimal to severe. The patient may complain of severe pain and a “tearing” sensation. Placenta previa occurs when the placenta attaches to the lower portion of the uterus and partially or completely covers the cervical opening. Common signs include “painless” bright red vaginal bleeding. Pre-eclampsia and eclampsia are known as “toxemia of pregnancy”. These disorders are characterized by hypertension, edema, weight gain, headache and visual disturbances. Eclampsia is further complicated by seizure disorders and a high mortality for both mother and child.

**Routine Paramedic Care: General Practice, p 5.**

**Establish IV Lactated Ringers**

**Type of emergency?**

**Abruptio Placenta**

**Vaginal Bleeding**

**Placenta Previa**

Treat for Shock

Left Lateral Recumbent

Establish Medical Control

**Eclampsia**

Left Lateral Recumbent

If hypoglycemic or drug overdose induced Status Epilepticus is suspected, refer to SEIZURE GUIDELINE, MEDICAL EMERGENCIES, P 48.

Magnesium Sulfate 4G in 20ml normal saline (slow IVP over 5 minutes) Follow with infusion of Magnesium Sulfate 1-2G/hr.
SUPINE HYPOTENSIVE SYNDROME

This condition manifests itself when a woman is in her third trimester of pregnancy in the supine position. The combined weight and mass of the fetus, uterus and placenta compress the inferior vena cava resulting in a reduced blood return to the heart. Subsequently, cardiac output is reduced and blood pressure drops suddenly. Unless there is another reason for the hypotension (blood loss, dehydration, etc) this condition is self-correcting if the patient is placed in a left lateral recumbent position. If severe hypotension is present assume the possibility of significant internal hemorrhage and treat per the shock guideline.

**Routine Paramedic Care:**

GENERAL PRACTICE, p 5.

Place LEFT Lateral Recumbent

Signs of shock?

**YES**

ESTABLISH IV ACCESS
LACTATED RINGERS
_titrater to B/P 90 mmHg_
follow the HYPOVELEMIC GUIDELINE, MEDICAL EMERGENCIES SECTION, p 48.

ESTABLISH MEDICAL CONTROL

**NO**

TRANSPORT AND REASSESS
CONTINUE ROUTINE PARAMEDIC CARE
TREAT AS APPROPRIATE

ESTABLISH MEDICAL CONTROL
EMERGENCY CHILDBIRTH

Labor is divided into three stages. The first stage begins with the onset of uterine contractions and ends with the complete dilation of the cervix. The second stage begins with the complete dilation of the cervix and ends with delivery of the fetus. The third stage begins with the delivery of the fetus and ends with delivery of the placenta. In general, the most common decision to be made with a patient in labor is whether to attempt delivery of the infant at the scene or transport the patient to the hospital. Factors that effect this decision include the frequency of contractions, prior vaginal deliveries, urge to push, and the presence of crowning. The urge to push and/or the presence of crowning indicate that delivery is imminent. In such cases, consideration should be given to delivering the infant on the scene or in the ambulance. Those conditions that require immediate transport, despite the threat of delivery, include: prolonged membrane rupture, breech presentation, cord presentation, extremity presentation, evidence of meconium staining, and nuchal cord (cord around the infants neck).

<table>
<thead>
<tr>
<th>Routine Paramedic Care: General Practice, p 5.</th>
<th>Obtain Labor/Gestational History:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position mother for delivery. Place her on her back, knees drawn up and spread apart, raise buttocks with a pillow or blanket.</td>
<td>• Gravidity (# of times pregnant)</td>
</tr>
<tr>
<td>1. Wash hands, open OB delivery kit, put on sterile gloves, drape mother</td>
<td>• Parity (# of offspring)</td>
</tr>
<tr>
<td>2. Coach mother to breathe deeply between contractions and to push with contractions.</td>
<td>• History of obstetrical complications/prenatal care</td>
</tr>
<tr>
<td>3. As the head crowns control it with gentle pressure and support the head during delivery and examine the neck for the presence of a looped (nuchal) umbilical cord. <strong>If the cord is looped around the neck, gently slip it over the infant’s head (if unable to do so, clamp the cord in two places and cut between the clamps to release the cord).</strong></td>
<td>• Expected date of delivery</td>
</tr>
<tr>
<td>4. Suction the mouth, then the nose of the infant as soon as possible.</td>
<td>• Length of time between contractions</td>
</tr>
<tr>
<td>5. Support the infant’s head as it rotates for shoulder presentation.</td>
<td>• Presence/absence of membrane rupture</td>
</tr>
<tr>
<td>6. With gentle pressure, guide the infant’s head downward to deliver the anterior shoulder and then upward to release the posterior shoulder. Complete delivery of the infant.</td>
<td>• Possibility of multiple births</td>
</tr>
<tr>
<td>7. Hold infant firmly with head down to facilitate drainage of secretions. Clear infant’s airway of any secretions with bulb syringe, mouth first and then the nose.</td>
<td></td>
</tr>
<tr>
<td>8. Apply two clamps to umbilical cord (if not already done due to nuchal cord). Place one clamp approx. 6” from the infant and the second 2-3” from the first. Cut the cord between the clamps.</td>
<td></td>
</tr>
<tr>
<td>9. Dry infant, wrap in towels/blankets, and cover the infant’s head.</td>
<td></td>
</tr>
<tr>
<td>10. Place the infant on the mother’s abdomen for mother to hold and support.</td>
<td></td>
</tr>
<tr>
<td>11. Record patient’s gender, time of birth and geographical location.</td>
<td></td>
</tr>
<tr>
<td>12. If infant resuscitation is not necessary, record APGAR score at 1 and 5 minute post-delivery.</td>
<td></td>
</tr>
<tr>
<td>13. <strong>If infant resuscitation is necessary, follow the newborn resuscitation guideline, pediatric emergencies section, p 86.</strong></td>
<td></td>
</tr>
<tr>
<td>14. Delivery of the placenta: (DO NOT DELAY TRANSPORT)</td>
<td></td>
</tr>
<tr>
<td>• As the placenta delivers, encourage the mother to push with contractions.</td>
<td></td>
</tr>
<tr>
<td>• Hold placenta with both hands, place in a plastic red bag and transport to the hospital with mother. NEVER pull on the umbilical cord to assist placenta delivery.</td>
<td></td>
</tr>
<tr>
<td>• Evaluate perineum for tears. If present, apply sanitary napkins to the area while maintaining direct pressure.</td>
<td></td>
</tr>
<tr>
<td>15. Transport and notify hospital as soon as possible.</td>
<td></td>
</tr>
</tbody>
</table>

Obstetrical Emergencies December-2013

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**BREECH DELIVERY**

The largest part of the fetus (head) is delivered last. In general, breech presentations include buttocks presentation and/or extremity presentation. An infant in a breech presentation is best delivered in the hospital setting since an emergency cesarean section is often necessary. However, if it is necessary to perform a breech delivery in an out of hospital setting, the following procedures should be performed:

**Routine Paramedic Care:**

*General Practice, p 5.*

**Obtain Labor/Gestational History:**
- Gravidity (# of times pregnant)
- Parity (# of offspring)
- History of obstetrical complications/prenatal care
- Expected date of delivery
- Length of time between contractions
- Presence/absence of membrane rupture
- Possibility of multiple births

**Urge to push and/or crowning**

1. **Prepare for Imminent Delivery**
2. **Transport and Reassess**
3. **Continue Routine**
4. **Treat as Appropriate**

1. Position mom for delivery. Place her on her back, knees drawn up and spread apart, raise buttocks with a pillow or blanket.
2. Wash hands, open OB delivery kit, and put on sterile gloves, drape mother.
3. Allow the fetus to deliver spontaneously up to the level of the umbilicus. If the fetus is in a front position, gently, extract the legs downward after the buttocks are delivered.
4. After the legs are clear, support the baby’s body with the palm of the hand and the forearm.
5. After the umbilicus is visualized, gently extract a 4” to 6” loop of umbilical cord to allow for delivery without excessive traction on the cord. Gently rotate the fetus to align the shoulder in an anterior-posterior position. Continue with gentle traction until the axilla is visible.
6. Gently guide the infant upward to allow delivery of the posterior shoulder.
7. Gently guide the infant downward to deliver the anterior shoulder.
8. During a breech delivery, avoid having the fetal face or abdomen toward the maternal symphysis.
9. The head is often delivered without difficult. However, be careful to avoid excessive head and spine manipulation or traction.
10. If the head does not deliver immediately, action must be taken to prevent suffocation of the infant.
   - Place a gloved hand in the vagina with the palm toward the baby’s face.
   - With the index and middle fingers, form a “V” on either side of the infant’s nose.
   - Gently push the vaginal wall away from the infant’s face until the head is delivered.
   - If unable to deliver the infant’s head within three minutes, maintain the infant’s airway with the “V” formation and rapidly transport to the hospital.
11. Establish medical control.
PROLAPSED UMBILICAL CORD

This occurs when the cord slips down into the vagina or presents externally after the amniotic membranes have ruptured. Fetal asphyxia may rapidly ensue if circulation through the cord is not re-established and maintained until delivery. If the umbilical cord is seen in the vagina, insert two fingers of a gloved hand to raise the presenting part of the fetus off the cord.

1. Instruct the mother to “pant” with each contraction to prevent her from bearing down.
2. Insert two gloved fingers into the vagina and gently elevate the presenting part to relieve pressure on the cord and restore an umbilical pulse. DO NOT attempt to reposition or push the cord back into the uterus.
3. If assistance is available, apply moist sterile dressings to the exposed cord.
4. Maintain hand position during rapid transport to the hospital.

TRANSPORT RAPIDLY
CONTINUE ROUTINE PARAMEDIC CARE

ESTABLISH MEDICAL CONTROL
POSTPARTUM CARE OF THE INFANT

The active term infant requires no intervention during transport. Allow the mother to hold the baby during transport. It is essential to prevent heat loss in newborns. It is important to rapidly dry the infant, cover the head, and wrap the baby in warm blankets. When the baby remains depressed after drying, warming, and clearing the airway, begin resuscitation.

**Routine Paramedic Care:**
- Patient assessment
- APGAR at 1 and 5 minutes
  **Assess and Support**
  - Temperature (warm and dry)
  - Airway (position and suction)
  - Breathing (stimulate to cry)
  - Circulation (heart rate and color)

**Assess Breathing**

**Absent or Irregular**

**Go To Newborn Resuscitation Guideline, Pediatric Emergencies, P 63.**

**Assess Heart Rate**

**< 100 BPM?**

**Go To Newborn Resuscitation Guideline, Pediatric Emergencies, P 63.**

**Normal**

Place clamps on cord at 6” and 8” from infant’s body and cut cord between both clamps.

Allow mother to hold baby if her condition allows it. Keep both baby and mother warm.

**Transport and Reassess**
**Continue Routine Paramedic Care**
**Treat as Appropriate**
POSTPARTUM CARE OF MOTHER

An uncomplicated child birth should require limited postpartum care of the mother. Allow the mother to hold the baby during transport. Keep mother comfortable and warm. Prepare for the delivery of the placenta.

Place clamps on cord at 6” and 8” from infant’s body and cut cord between both clamps.

Allow mother to hold baby if her condition allows it. Keep both baby and mother warm.

Prepare for delivery of the placenta:
1. DO NOT DELAY TRANSPORT
2. As the placenta delivers, encourage the mother to push with contractions.
3. Hold placenta with both hands, place in a plastic red bag and transport to the hospital with mother. NEVER pull on the umbilical cord to assist placenta delivery.
4. Evaluate perineum for tears. If present, apply sanitary napkins to the area while maintaining direct pressure.

TRANSPORT AND REASSESS
CONTINUE ROUTINE PARAMEDIC CARE
TREAT AS APPROPRIATE

ESTABLISH MEDICAL CONTROL
TRAUMA IN PREGNANCY

The most common cause of fetal death is maternal death. The fetus may be in jeopardy while the mother’s vital signs are stable. Treat the mother aggressively for injuries based on mechanism of injury. Early and rapid transport is essential to fetus viability.

Routine Paramedic Care:
General Practice, p 5.

Imobilize C-spine*

Follow appropriate trauma guideline

Check externally for:
- Uterine contractions
- Vaginal bleeding
- Amniotic fluid leak

Establish IV access
Lactated Ringers
Titrare to B/P 90 mmHg

Transport
Reassess and treat as appropriate
Establish medical control

Note

* If the patient becomes hypotensive while on the backboard, elevate the right side of the backboard to relieve pressure on the inferior vena cava from uterus.
~ ENVIRONMENTAL EMERGENCIES ~

DROWNING / NEAR DROWNING .................................................................90
ELECTROCUTION / LIGHTNING INJURIES .................................................91
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Drowning is defined as death that is a result of asphyxia after submersion and occurs within 24 hours after submersion. Near-drowning is defined as a submersion episode that results in survival (full or partial recovery) or temporary survival that ultimately leads to death after a period of 24 hours. Factors affecting survival include: patient’s age, patient’s medical history, submersion time, temperature of the water, salt or fresh water, purity of the water, and did the patient struggle. All natural waters in CT are considered “cold water”. It is important to note drowning incidents also occur in swimming pools, hot tubs and in bathtubs, particularly with children.

**NOTES**

1. All drowning / near-drowning victims with suspected barotraumas / decompression sickness should be transported in the left lateral Trendelenburg position to prevent any air emboli in the ventricles from migrating to the arterial system.

If the patient is hypotensive elevate the legs and increase the flow rate of the IV.
**ELECTROCUTION / LIGHTNING INJURIES**

Electrical injury patients usually require a combination of cardiac and trauma care, since they often have blunt injuries and burns as well as cardiac damage. Injury to the cervical spine should be presumed and protective measures taken. An electrical injury should be treated like a crush injury rather than a thermal burn because of the large amount of tissue damage under normal skin. Unlike high voltage electrical injuries where massive internal tissue damage may occur, lightning seldom causes substantial burns. Most of the burns are caused from other objects (rainwater, sweat, coins, necklaces, etc.) being heated up rather than the lightning itself. The amperage, voltage, type of current (AC vs. DC), duration of contact, tissue resistance, and current pathway through the body will determine the type and extent of injury. The interplay of these factors can produce effects ranging from barely noticeable tingling to instant death. Hypothermia should be ruled out when patients have been exposed to rainwater.

**NOTES**

Manage burn injuries and/or entrance and exit wounds as indicated. Multiple entrance and/or exit wounds may be present.

If burns are extensive manage the patient according to the BURN GUIDELINES p 53.
HEAT CRAMPS / EXHAUSTION / STROKE

**Heat cramps** commonly occur in the patient who exercises and sweats profusely, and subsequently consumes water without adequate salt. S/Sx: normal temperature with hot sweaty skin, mild tachycardia, normal BP. **Heat exhaustion** results from excessive fluid and electrolyte loss through sweating and lack of adequate fluid replacement when a patient is exposed to high environmental temperatures for a sustained period of time. S/Sx: nausea, lightheadedness, anxiety, confusion, cool clammy skin, tachycardia, low or normal BP with orthostatic changes. **Heat stroke** results when the body suddenly loses the ability to control internal heat dissipation. Activity during time of exposure to heat can increase the loss of fluid to the point of hypovolemia. Heat stroke can also result in seizures. S/Sx: hot flushed skin, tachycardia with thready pulse, abnormally high or low BP, or altered level of consciousness.

Move the patient to a cooler environment as soon as possible. Remove as much clothing as possible.

2ND IV ACCESS
NaCl or LR
Titrate to B/P > 90 mmHg

**TREAT**
**DYSRHYTHMIAS APPROPRIATELY**

Any seizure activity?

YES  NO

**ESTABLISH MEDICAL CONTROL**

**DIAZEPAM** 5 mg slow IVP after 5 min may repeat
**DIAZEPAM** 5 mg slow IVP
**MAX DOSE:** 10 mg
OR
**IF NO IV, ADMINISTER VERSED**
**2-4 mg IM** or
**APPROPRIATE WEIGHT BASED INTRANASAL DOSE¹**
after 5 min may repeat

**ESTABLISH MEDICAL CONTROL**

**NOTES**

¹ To determine the appropriate weight based dose of versed review the Intranasal Midazolam Protocol in the Medication appendix page 125.
HYPOTHERMIA / HYPOTHERMIC CARDIAC ARREST

Hypothermia is defined as a condition in which the body core temperature is below 95°F. Unlike frostbite, hypothermia can occur in environments with temperatures well above freezing. Hypothermia can effect healthy individuals who are placed into adverse conditions unprepared (primary hypothermia), or develop secondary to the patient’s existing illness or injury (secondary hypothermia). In the more profoundly hypothermic patient gentle handling is of utmost importance. The longer the exposure, the more blood flow is reduced to the periphery. Deep frostbite (freezing of the tissues) develops if the patient does not recognize or react to the numbing sensation of the frostbite. Mild to moderate hypothermia S/Sx: shivering, lethargy with normal mentation, muscles stiffness and uncoordinated or staggered gait. Severe hypothermia S/Sx: ALOC which can progress into coma, cessation of shivering, muscle stiffness and rigidity, uncoordination, EKG may show J waves (small notch at the terminal end of the QRS complex). A-fib is the most commonly seen dysrhythmia in hypothermia. VF is more probable as the body’s core temperature falls <86°F.

**NOTES**

1. Avoids precipitating VF or other cardiac dysrhythmias
2. Do not administer medications unless directed to do so by medical control.
   - Once you have started CPR do not give up!
   - THE HYPOTHERMIC PATIENT IS NOT DEAD-UNTIL HE IS WARM AND DEAD!
RADIATION INJURIES

An individual can receive a radiation dose from an external source. Such an individual is not contaminated, but has been “exposed” to radiation. The danger to a victim depends on the radiation dose received and the period of time (or duration) of the exposure. A person is “contaminated” when he/she has been physically covered by, or has absorbed or ingested radioactive material. Unlike the toxicity from chemical or noxious gases, radiation causes little or no acute damage. Therefore, life-threatening conditions should be treated without regard to radiation exposure or contamination. Medical therapy should include in order of importance: (1) first aid and resuscitation, (2) medical stabilization, and (3) definitive treatment of serious injuries. Thereafter, other issues should be addressed, such as preventing or minimizing contamination, treatment of minor injuries, and treatment of internal contamination. If a radiation dose has been received from an external source, an exposed victim does not emit radiation. Thus, medical treatment should be the same as that for any other patient. For victims who are exposed and contaminated with radioactive material, medical therapy for serious conditions always takes precedence over decontamination. Although contaminated individuals may emit small amounts of radiation from their body, the risks to healthcare givers are commensurate with or below the risks commonly faced during the course of medical practice in an Emergency Department. It is virtually impossible for a victim to be so heavily contaminated that he/she is a radiation hazard to healthcare providers. Use of standard universal precautions (including surgical gloves, masks, shoe covers and disposable gowns) protects healthcare providers from radiation contamination. A good approach to a contaminated individual is to act as though the victim has been contaminated with human blood, body fluids or raw sewage. Treatment of injured victims should take place according to standard triage guidelines. All medical decisions should be based solely on the physical condition of the victim, regardless of radiological contamination.
NERVE AGENT EXPOSURE

Nerve agents comprise the largest portion of known chemical agent stockpiles. Chemical contamination can be swift and debilitating and countermeasures should be taken as soon as possible. Under temperate conditions, nerve agents are liquid, but can be easily converted to gases for wider dissemination. In either form, they are almost odorless and colorless and are effective solvents, easily penetrating clothing. They are both fat and water soluble, making them readily absorbed into the body through the skin, mucus membranes, and respiratory tract. Nerve agents do not act on actual nerves, but effect the chemical stimulations sent out by the autonomic nervous system controlling the heart, lungs, and the organs found in the abdomen. Nerve agents are organophosphorous cholinesterase inhibitors. They produce their effect by interfering with normal transmission of nerve impulses in the parasympathetic autonomic nervous system. They bind to acetylcholinesterase and irreversibly inactivate it, producing a toxic buildup of acetylcholine at the synapses, over stimulating their target and creating hyperactivity throughout the affected organs. The Mark I Auto injector Kit treats this reaction two ways: the atropine acts as an acetylcholine blocker while the pralidoxime chloride assists in the regeneration of the blocked cholinesterase. The Mark I Auto-Injector treats this reaction by neutralizing the messenger impulses causing the over stimulation and freeing the enzyme that usually perform this function. Death from nerve agent exposure usually results from respiratory failure when an untreated large exposure causes paralysis of the diaphragm and intercostal muscles (thoracic wall), seizure activity, malfunction in the brain’s respiration center, and excessive bronchial secretions. The primary intent of using MARK I Kits is to allow first responders to self-treat or to treat other first responders in the event of a chemical nerve agent exposure. However, the Connecticut Department of Public Health realizes that, in the event of a mass public exposure to a nerve agent, the first responders may possess the resources to treat other members of the public safety response team. Accordingly, the Connecticut Department of Public Health endorses the following protocol for on-scene administration of the MARK 1 Kits:

ON-SCENE PROTOCOL

“A Disaster Occurs and an MCI is Declared”
↓
Self-Treat and Treat Your Crew
↓
Provide Treatment To Other Public Safety Responders
↓
Paramedics May Administer the MARK 1 Kits
   If sufficient resources are not available then:
      ↓
Basic-EMT May Administer the MARK 1 Kits
         If sufficient resources are not available then:
            ↓
Trained First Responders May Administer the MARK 1 Kits

TRANSPORT PROTOCOL

For patients requiring continued administration of the MARK 1 Kit the Connecticut Department Of Public Health authorizes the following transportation protocol (in order of preference):
↓
Paramedic Accompanies the Patients
   *If sufficient resources are not available then:*
      ↓
Basic-EMT Accompanies the Patients
         *If sufficient resources are not available then:*
            ↓
MARK 1 kits may be given to transporting medical personnel to facilitate continued patient care, including air-evacuation crew
USE OF NERVE AGENT ANTIDOTE KITS

The following protocol is published verbatim from the Connecticut Department of Public Health “Protocol for the Use of Nerve Agent Antidote Kits (NAAK) Mark 1”. Additional information regarding nerve agent and auto-injector use can be found in Appendix H.

Indications for Use
In the event of exposure to a known or a suspected WMD chemical agent, responders should withdraw immediately from the area if possible. Withdrawal should be made with the realization that the responder may be contaminated and should be limited to the nearest fresh-air site avoiding contamination of bystanders or other responders.

Kit Dosing
1. In general, pinpoint pupils, increased secretions, and muscle fasciculation are the most reliable signs of nerve agent exposure. SLUDGEM is the acronym used to characterize the signs and symptoms of an exposure: S – Salivation, L – Lacrimation, U – Urination, D – Defecation, G – GI distress, E – Emesis, M - Miosis
2. Nerve agents are either vaporous or liquid agents belonging to the classification of drugs known as organophosphates. Tabun (GA), Sarin (GB), Soman (GC) and VX are the most commonly stockpiled agents. The first three, though transported as liquids, are weaponized by vaporization and are inhaled. VX stays in a heavy liquid form, much like motor oil, and is spread by the droplet route.
3. Mark 1 auto injectors should not be administered to persons over age 65 or less than 12 years of age. Caution should be given to atropine administration to persons with underlying cardiovascular or renal disease. In these cases, consult Medical Control for medical supervision.

Mild Vapor Exposure
1. Signs and symptoms following a vapor exposure occur within seconds to minutes, and include:
   a. Miosis – constriction of the pupil. Characteristically occurs from a nerve agent vapor exposure to the eye, or from direct liquid contact with the eye. Miosis is usually accompanied by eye pain, described often as a dull ache in the front of the forehead or as pain about the orbit.
   b. Headache
   c. Dim vision
   d. Increased salivation, lacrimation (tearing), and rhinorrhea (runny nose). Rhinorrhea may be the first indicator of exposure, aside from eye findings, in a vapor exposure.
   e. Mild respiratory distress
   f. Mild muscle weakness and/or mild, localized muscle twitching
2. Management
   a. Most symptoms resolve spontaneously within 15-30 minutes
   b. No specific treatment is indicated
3. Treatment:
   a. If airway effects are noted (chest tightness, shortness of breath, airway secretions), and/or if other symptoms are not improving over time, ONE MARK-I kit is administered.
   b. Monitor progress, noting that MARK-I auto injectors will not reverse miosis. Supplemental oxygen is required in those personnel with pulmonary manifestations, or with a history of cardiac disease.
   c. Remove from area and decontaminate immediately.

Moderate Exposure
1. Signs and symptoms for a moderate exposure include:
   a. Those occurring in mild exposures
   b. More respiratory distress
   c. Muscular weakness and fasciculation – twitching can be localized, as in the case of mild to moderate liquid exposure, or generalized, as in large liquid and moderate to large vaporous exposures
   d. Gastrointestinal effects (vomiting and diarrhea) – these are generally the first systemic signs of skin exposure (liquid agent) to a nerve agent
   e. Sweating – may be localized for a mild to moderate liquid exposure, or generalized for a vapor or large liquid exposure
   f. Tachycardia, hypertension
2. Management and Treatment:
   a. **ONE OR TWO MARK-I kits are administered**, and titrate to symptomatology (up to a maximum of three MARK I kits)
   b. Respiratory management – supplemental oxygen, assistance in secretion management
   c. Remove from area and decontaminate immediately.

**Severe Exposure**
1. Signs and symptoms for a severe exposure include:
   a. Miosis
   b. Copious respiratory secretions impairing a patent airway
   c. Severe respiratory distress or apnea
   d. Possible cyanosis
   e. Muscle twitching which progresses to muscle rigidity and flaccid paralysis
   f. Altered level of consciousness – patient may be unconscious or seizing
   g. Incontinence of bowel and bladder

2. The onset of symptoms for a severe exposure is usually rapid, from seconds to minutes for a vapor exposure, but may take up to 30 minutes for a VX or liquid exposure.

3. Management and Treatment
   a. Aggressive airway control, including BVM, intubation, vigilant suctioning, or endotrachael intubation.
   b. **THREE MARK-I kits should be given in rapid succession**
   c. Anticonvulsant medications will probably be required, even in the absence of seizure activity. Administer ONE DIAZEPAM AUTO-INJECTOR. **Only if credentialed as a paramedic with medical control privileges through the William W. Backus Hospital.**
   d. Remove from area and decontaminate immediately.

**Special Considerations**
1. Riot control agents, i.e. mace, tear gas, pepper spray, are irritants to mucous membranes
   a. Excessive tearing and rhinorrhea will be present
   b. Shortness of breath may be present
   c. Miosis is never present
   d. Atropine and Pralidoxime are not indicated

2. Pesticides, such as malathion, chlorpyrifos and diazinon are also organophosphates
   a. They are not as potent
   b. Treatment is usually limited to atropine alone
   c. Pralidoxime is not indicated for pesticides containing carbamates

3. Industrial gases, such as chlorine and phosgene, have similar presentations to nerve agents
   a. Shortness of breath, skin or mucous membrane irritation, and cough may be present
   b. Muscle fasciculation and miosis are not present
~ SEDATION/PAIN MANAGEMENT ~

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SEDATION ASSISTED INTUBATION ALGORITHM .................................................................100
POST-SEDATION INTUBATION MANAGEMENT ......................................................................101
# PAIN MANAGEMENT

The following guideline may be utilized, but not limited to the patient who has an isolated traumatic extremity injury, significant burn, or a painful paramedic initiated management (e.g. transcutaneous pacing, cardioversion) and who is hemodynamically stable. This does not apply to any patient complaining of non-specific pain or with any multi-systems trauma patient or a situation in which multiple trauma may be a possibility.

**ROUTINE PARAMEDIC CARE:**
GENERAL PRACTICE, p 5.

- Immobilize C-spine/Spinal column
- Evaluate and treat any life threatening injuries

**PAIN MANAGEMENT**

**Sedation**

**ADMINISTER DIAZEPAM**

2 – 5 mg slow IVP
(Pedi dose 0.1 mg/kg)

Max Dose of Diazepam on standing order: 10 mg IVP

-OR-

**VERSED**

2 - 4 mg IVP
(Pedi dose 0.05 mg/kg)

may be repeated once after 5 min

IF NO IV, ADMINISTER VERSED

2 - 4 mg IM or

APPROPRIATE WEIGHT BASED INTRANASAL DOSE

-OR- ATIVAN

1-2 mg IVP or IM
(Pedi dose 0.1 mg/kg)

**PAIN MANAGEMENT**

**ADMINISTER MORPHINE SULFATE**

2-5 mg IVP (adult)
0.1 mg/kg (pediatric)

or

FENTANYL 1 mcg/kg SIVP or IN
(Max dose 50 mcg)

or

DILAUDID 1 mg IVP (adult)
0.01 mg/kg (pediatric)

Analgesic may be repeated every 10 minutes to a total of 3 doses

If patient develops nausea, you may administer ONDANSETRON 4 mg IVP

0.1 mg/kg (pediatric)

**ESTABLISH MEDICAL CONTROL**

**PREPARE PATIENT FOR IMMEDIATE TRANSPORT**

2ND IV ACCESS

NaCl or LR

Titrate to B/P > 90 mmHg

**Establish Medical Control**

**Is B/P > 90 mmHg?**

**YES**

**NO**

**NOTES**

1 To determine the appropriate weight based dose of Versed review the Intranasal Midazolam Protocol in the Medication appendix page 125.

2 FENTANYL: If given intranasal, increase dose to 1.5 mcg/kg, maximum of 100 mcg.
SEDATION ASSISTED INTUBATION ALGORITHM

Airway management is the key to successful patient outcome. Instances arise in which the patient is in need of intubation, but due to combativeness and/or an intact gag reflex, intubation is not possible. Sedation assisted intubation is indicated in adult or pediatric patients with impending respiratory failure or inadequate ventilation in whom paramedics are unable to control the airway. These may include: COPD- chronic obstructive pulmonary disease, CHF- congestive heart failure, severe asthma, combative head injured patients, burn patients with airway involvement, trauma patients with an unprotected airway and patients with trismus.

Once Sedated:
- Monitor O2 Saturation
- Attempt intubation
- Verify Tube placement
- Secure tube
- Apply Cervical Collar
- Monitor ETCO2 continuously

Continue with patient care management according to patient presentation and guidelines

ESTABLISH MEDICAL CONTROL

CONSIDER PRE-MEDICATION IF:
- ADULT BRADYCARDIA- ATROPINE - 0.5 mg IVP.
  May repeat if heart rate remains < 60.
- HEAD INJURY- CONSIDER LIDOCAINE 1.5 mg/kg IVP.
- CHILD UNDER 10 YEARS2- ATROPINE - 0.02 mg/kg IVP

Is B/P > 90 mmHg?

YES

NO

PREPARE PATIENT FOR IMMEDIATE TRANSPORT

May repeat 1 time (Except Etomidate)

2ND IV ACCESS NaCl or LR
Titrate to B/P > 90 mmHg

250 cc NaCl fluid bolus

ESTABLISH MEDICAL CONTROL

After 2-3 minutes is sedation adequate?

YES

NO

If still inadequately sedated or B/P < 90 mmHg

ESTABLISH MEDICAL CONTROL

NOTES
1 Contraindications include: Obesity, facial or airway trauma (GSW to face, facial fractures, tracheal laceration, etc.), airway obstruction (stridor), airway malformations, cardiac arrest, patients who are difficult to bag for any reason (beard, malformations, etc), patients who respond to non-invasive airway management.

2 For children < 10 years old atropine must be administered, regardless of heart rate, to prevent reflex bradycardia. This is a one-time dose only.
POST-SEDATION INTUBATION MANAGEMENT

Once the patient has been sedated and intubated, according to guidelines, the patient may begin to “fight or buck” the endotracheal tube. In order to protect the patient’s airway and manage the patient in a safe and effective manner the following guideline should be utilized.

Patient is intubated and has POSITIVE confirmation of tube placement

- Monitor ETCO2
- Monitor O2 Saturation
- Confirm tube placement
- Confirm a secure tube

If B/P > 90 mmHg?

YES

Prepare patient for immediate transport

2ND IV ACCESS
NaCl or LR
Titrate to B/P > 90 mmHg

NO

Patient begins to “fight or buck” tube

ADMINISTER VERSED
2 – 5 mg IVP
-OR-
DIAZEPAM
5 mg slow IVP
-OR-
ATIVAN
1-2 mg IVP

ADMINISTER MORPHINE SULFATE
2-5 mg IVP (adult)
0.1 mg/kg (pediatric)
or
FENTANYL 1 mcg/kg slow IVP
(Max dose 50 mcg)
or
DILAUDID 1 mg IVP (adult)
0.01 mg/kg (pediatric)

Continue to:
- Monitor ETCO2
- Monitor O2 Saturation
- Confirm tube placement
- Confirm a secure tube

250 cc NaCl fluid bolus

ESTABLISH MEDICAL CONTROL

Notes

1 Verification of tube placement requires the following methods: Visualization of tube passing through vocal cords, presence of bilateral breath sounds, absence of epigastric sounds, equal chest rise, presence of tube fogging, colormetric CO2 device, capnography and O2 saturation monitoring.

2 Securing of the tube requires use of a commercial ETT securing device and cervical collar use.

If intubation fails and the patient is not apneic and/or continues to have a gag reflex the respiratory support should be maintained through adequate bag-valve-mask ventilations with 100% oxygen.

3 Check for clear lung sounds prior to the administration of fluid boluses. Any signs of pulmonary edema would contraindicate the use of fluid boluses. Contact medical control for further direction. If fluid boluses resolve the hypotension, continue with the rest of the algorithm.
APPENDIX A - AIRWAY

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LARYNGEAL MASK AIRWAY

The laryngeal mask airway (LMA) is a supraglottic airway management device. The LMA provides an airway adjunct with an inflatable cuff at the distal end that is introduced into the pharynx. The device is advanced until resistance is felt indicating the distal end of the tube is in the hypopharynx. When the cuff is inflated, the mask is pushed up against the tracheal opening, providing an effective seal and a clear airway into the trachea.

THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.

Indications
- Apneic patient without a gag reflex where endotracheal intubation cannot be established.

Caution:
- The LMA does not protect the airway from the effects of regurgitation and aspiration.

Contraindications
- Greater than 14 weeks pregnant
- Grossly or morbidly obese
- Multiple or massive injury
- Maxillofacial trauma
- Patients with fixed pulmonary compliance, such as pulmonary fibrosis
- Acute abdominal or thoracic injury

Equipment
- Personal protective equipment
- Appropriate size laryngeal mask airway
- Syringe of appropriate volume for laryngeal mask airway
- 10 or 12 Fr suction catheter
- Water-soluble lubricant
- Adhesive tape
- Bag-valve-mask resuscitator
- Oxygen source
- Suction device

Laryngeal Mask Airway Selection Guideline

<table>
<thead>
<tr>
<th>LMA Airway Size</th>
<th>Patient Size</th>
<th>Maximum Volume of Air for Cuff Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Children 30 – 50 kg</td>
<td>20 ml</td>
</tr>
<tr>
<td>4</td>
<td>Adults 50 – 70 kg</td>
<td>30 ml</td>
</tr>
<tr>
<td>5</td>
<td>Adults 70 – 100 kg</td>
<td>40 ml</td>
</tr>
<tr>
<td>6</td>
<td>Adults &gt; 100 kg</td>
<td>50 ml</td>
</tr>
</tbody>
</table>

Procedure
1. Hyperoxygenate the patient
2. Select the correct size
3. Prior to insertion the cuff should be tightly deflated so it forms a smooth wedge shape without any wrinkles. This can be accomplished by compressing the mask tip between finger and thumb to achieve the correct wedge shape.
4. Lubricate the cuff with water-soluble lubricant
5. Position the patient's head as normally used during endotracheal intubation, i.e. “sniffing position.”
6. Hold the laryngeal mask airway like a pen, with the index finger placed at the junction of the cuff and the airway tube.
7. Under direct vision, press the tip of the cuff upward against the hard palate and flatten the cuff against it.
8. Using the index finger, keep pressing upwards as you advance the mask into the pharynx to ensure the tip remains flattened and avoids the tongue.
9. Keep the neck flexed and head extended and press the mask into the posterior pharyngeal wall using the index finger.
10. Continue pushing with your index finger and guide the mask downward into position.
11. Grasp the tube firmly with the other hand, and then withdraw your index finger from the pharynx.
12. Press gently downward with your other hand to ensure the mask is fully inserted.
13. Inflate the mask with the recommended volume of air.
   • Do not over-inflate the LMA.
   • Normally the mask should be allowed to rise up slightly out of the hypopharynx as it is inflated to find its correct position.
14. Connect the laryngeal mask airway to a bag-valve-mask device
15. Ventilate the patient while confirming equal breath sounds over both lungs and absence of ventilatory sounds over the epigastrium. Confirm equal and bilateral chest rise.
16. Insert a bite-block to prevent occlusion of the tube should the patient bite down.
17. Secure the tube utilizing the same techniques to secure an endotracheal tube.
ENDOTRACHEAL INTUBATION

Airway management is the key to successful patient outcome. Endotracheal intubation is regarded as the “gold standard” by which all other methods of securing the airway are compared.

THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.

Indications:
- Respiratory arrest
- Cardiac arrest
- Patients without intact protective (gag) airway reflexes
- Severe dyspnea

Special Considerations:
- Cervical spine injury (or suggestive mechanism of injury)
- The patient should have an IV established and SpO₂ and EKG monitoring
- Intubation should not take more than 15-30 seconds
- Have suction ready

Complications:
- Hypoxia and hypercarbia secondary to bronchial or esophageal intubation
- Dental or soft tissue damage secondary to traumatic intubation

Procedure:
1. Assemble equipment:
   - Check laryngoscope light
   - Choose appropriate size tube, be sure cuff is intact
   - Prepare suction equipment
2. If using a stylet, it should be placed inside the tube with the tip at least ½ inch from the distal end.
3. Provide the patient with high concentration oxygen prior to intubation. If the patient’s respiratory rate is >= 10/min., use a non-rebreather mask. If the patient’s respiratory rate is < 10/min., ventilate with a bag-valve-mask.
4. Place the patient’s head in a “sniffing position.” Hyperextension should not be used for patients with suspected spine injuries or for newborns and young children. Have an assistant stabilize the neck during intubation if a neck injury is possible.
5. Insert laryngoscope with the left hand while keeping the blade to the right of the midline and pushing the tongue to the left.
6. Slowly advance the blade, the curved blade coming to the vallecula, the straight blade going beneath the epiglottis. Gentle traction is exerted upward; do not use the teeth as a fulcrum. If necessary, using the right hand, apply gentle backward, upward, rightward pressure (BURP maneuver) to the thyroid cartilage to improve view of the vocal cords. If available, an assistant may maintain this pressure for you using the Sellick maneuver.
7. Visualize the vocal cords; insert tube, with the right hand from the right side of the mouth through the vocal cords.
8. If a cuffed tube was used, inflate the cuff.
   - Verify placement with an esophageal detector device (EDD) and/or a CO₂ detector (remember CO₂ detectors can give a false positive when a patient has been without respirations and/or ventilations for a period of time).
   - While ventilating, auscultate the epigasutrum and both sides of the chest. Confirm correct tube placement by the presence of bilateral breath sounds and the absence of epigastric sounds. Visualize chest rise and fall with ventilations. Note the presence of vapor in the tube.
10. Secure the tube with a commercial tube holder device.
11. Consider head stabilization to limit the potential for tube dislodgement.
12. Intubation should not take more than 15-30 seconds.
13. Documentation should include the following:
   - Tube depth
14. All intubated patients with a pulse should have pulse oximetry continuously monitored throughout transport and documented.

15. Any time the patient is moved, or a change in the lung compliance with ventilation is detected, the tube placement should be reassessed by auscultation and an esophageal detector device, color metric carbon dioxide detector, use of continuous waveform capnography and/or pulse oximetry.
## ENDOTRACHEAL TUBE SIZE SELECTION

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Weight (kg)</th>
<th>Size (I.D.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>1</td>
<td>2.5 – 3.0</td>
</tr>
<tr>
<td>Newborn</td>
<td>2</td>
<td>3.0 – 4.0</td>
</tr>
<tr>
<td>6 Months</td>
<td>4</td>
<td>3.5 – 4.5</td>
</tr>
<tr>
<td>1 Year</td>
<td>10</td>
<td>4.0 – 5.0</td>
</tr>
<tr>
<td>3 Years</td>
<td>15</td>
<td>4.5 – 5.5</td>
</tr>
<tr>
<td>5 Years</td>
<td>20</td>
<td>5.0 – 6.0</td>
</tr>
<tr>
<td>6 Years</td>
<td>22</td>
<td>5.5 – 6.5</td>
</tr>
<tr>
<td>8 Years</td>
<td>25</td>
<td>6.0 – 6.5</td>
</tr>
<tr>
<td>10 Years</td>
<td>30</td>
<td>6.5 – 7.0</td>
</tr>
<tr>
<td>12 Years</td>
<td>40</td>
<td>6.5 – 7.0</td>
</tr>
<tr>
<td>16 Years</td>
<td>50</td>
<td>7.0 – 7.5</td>
</tr>
<tr>
<td>Adult Female</td>
<td>70</td>
<td>7.5 – 8.5</td>
</tr>
<tr>
<td>Adult Male</td>
<td>80</td>
<td>8.0 – 9.0</td>
</tr>
</tbody>
</table>

Rule of thumb for pediatrics (up to 16) for ET tubes: \( \frac{\text{Age} + 16}{4} \)
ETT CONFIRMATION ADJUNCTS

Verification of tracheal intubation requires a combination of clinical signs and the use of adjunctive devices. There are several types and brand name equipment to choose from. It is not the policy of this sponsor hospital to dictate which brands to use. However, it is our policy that tube placement be confirmed in the following manner:

- Visualization of the tube passing through the vocal cords (oral intubation only)
- Equal and bilateral chest rise
- Presence of bilateral lung sounds at each apex and base
- Absence of sounds over the epigastric area
- Presence of condensation in the tube
- Use of an esophageal detector device or end tidal carbon dioxide detector or use of continuous waveform capnography
- Use of pulse oximetry

Procedure for adjunct usage:
1. An end tidal CO$_2$ detector and/or esophageal detector device will be placed.
2. The patient will be ventilated with 100% oxygen.
3. After a few ventilations, depending on the type/brand of end tidal CO$_2$ detector used the paramedic will confirm ET placement by noting color change (from purple to yellow) or CO$_2$ values.
4. If the EDD (Esophageal Detector Device) is used, a rapid re-inflation will occur (bulb type) or the plunger will remain in the pulled back position (syringe type). Both indicate the presence of free air in the trachea.
5. Once placement of the ETT has been confirmed, the ETT must be secured with a commercial device.
6. If the end-tidal CO$_2$ detector or EDD indicates an incorrectly placed tube, immediate visualization of the endotracheal tube must be done. If the ETT is incorrectly placed, immediately remove it, hyperoxygenate the patient and reattempt intubation.
7. If visualization shows the ETT is properly placed, secure the tube with a commercial securing device and continue to ventilate and monitor the patient en route to the hospital. Report the findings to the accepting physician.

NOTES

It is possible to have a positive placement finding with the EDD, if the tip of the tube is just above the vocal cords, but not through the cords. Rapid inflation of the bulb may occur or the plunger may remain pulled back. Drowning may provide a false negative result.

It is possible for an end tidal CO$_2$ detector to have a positive color change with an esophageal intubation. This may occur for a limited time, usually on 4 or 5 ventilations. Correct color change can be assured after this. Once a patient has stopped cellular respiration color change is not always possible even with a properly placed ETT.

ENDOTRACHEAL TUBE INTRODUCER
**Indications**
An introducer may be necessary for directional control during routine or difficult endotracheal intubation when the glottic opening cannot be completely visualized.

**Contraindications**
Placing an endotracheal tube smaller than 6.0 mm.

**Precautions**
- Excessive force
- Passage beyond the carina
- Blind introduction may result in soft tissue damage or bronchial rupture.

**Procedure**
1. Prepare the patient for endotracheal intubation.
2. Assemble the equipment for endotracheal intubation.
3. Bend the introducer into a concave shape (hockey stick) and lubricate it with water-soluble lubricant.
4. Perform the laryngoscopy, obtaining the best possible view of the glottic opening.
5. Guide the distal tip of the introducer through the glottic opening and then advance it into the trachea.
6. Confirm tracheal placement by the following:
   - Detection of “clicks” as the introducer slides over the tracheal rings.
   - “Hold up” of the tip of the introducer against the walls of the airway. Once hold up is felt, the introducer should be withdrawn 5 cm to prevent the endotracheal tube from impacting the carina.
   - **Failure to elicit “clicks” or “hold ups” indicates incorrect (esophageal) placement.**
7. Once correct placement is confirmed, thread an appropriately sized endotracheal tube over the introducer and into the trachea.
8. Holding the endotracheal tube firmly in place, gently withdraw the introducer.
9. Remove the laryngoscope, inflate the cuff on the endotracheal tube and proceed with confirmation of tube placement as per Endotracheal Intubation Guidelines.
NEEDLE CRICOTHYROTOMY

This is a simple percutaneous technique that can provide adequate ventilations for a patient with an upper airway obstruction. It does not allow for “complete” control of the airway, but it produces fewer early and late complications than cricothyrotomy. It should be performed ONLY in extreme situations. A commercially available cricothyroidotomy kit is recommended. This guideline was written for use with the QUIK-TRACH™.

MAY BE PERFORMED ON STANDING ORDER FOR COMPLETE AIRWAY OBSTRUCTION NOT MANAGEABLE BY OTHER INTERVENTIONS.

REQUIRES ON-LINE MEDICAL DIRECTION FOR ALL OTHER SITUATIONS.

Indications:
- Inability to obtain an airway by any other method
- Impacted foreign body
- Laryngeal trauma
- Physical or chemical injuries to the lining of the larynx
- Rarely – allergic laryngeal edema, epiglottitis, croup

Contraindications:
- Tracheal trauma or transection
- Massive neck edema
- Obstruction or injury below the level of the cricothyroid membrane

Potential Complications:
- Asphyxia
- Aspiration
- Cellulitis
- Esophageal perforation
- Exsanguinating hematoma
- Hematoma
- Posterior tracheal perforation
- Subcutaneous and/or mediastinal emphysema
- Thyroid perforation
- Inadequate ventilations leading to hypoxia and death
- Kinking or obstruction of the catheter

Equipment Preparation:
1. Bag-valve-mask with reservoir and portable oxygen attached. Turn off pressure relief valve, or manually occlude to ensure adequate pressure.
   a. 14 gauge angiocath
   b. Two 10 or 12 cc syringes
   c. Any cuffed endotracheal tube
   d. Betadine swabs
3. Needle syringe: Using a 14 gauge or larger short length angiocath; remove the rear stopper and twist on a 10 or 12 cc syringe.
4. ET syringe:
   a. Remove the plunger from a 10 or 12 cc syringe
   b. Insert any cuffed endotracheal tube, preferably shortened, into the syringe and inflate cuff.

Patient Preparation
1. Paramedic and assistant(s) don BSI splash protection
2. Assign one certified rescuer to manually immobilize the cervical spine, and remove cervical collar temporarily.
3. With the patient supine and neck in a neutral position, palpate the thyroid notch, locating the cricothyroid membrane below. Visually verify that the cricothyroid membrane is midway between the chin and the sternal notch.
4. Stabilize the thyroid cartilage with your non-dominant hand, and with the dominant hand sterilize the puncture site.

**Procedure**

1. While manually stabilizing the trachea with the non-dominant hand, at a 45-degree angle, hold the barrel of the “needle syringe”, and slowly puncture the cricoid membrane caudally. Aspirate while advancing the needle. If successful, hold the syringe and stylet, while fully advancing the catheter. Remove the stylet.
2. If possible, stabilize the angiocath by securing it to the neck with ½ tape, and by taping rolled 4x4 gauze on each side of the catheter.
3. Attach the prepared “ET syringe” and ventilate with a bag-valve-mask, watching for slow chest rise and assess for lung sounds. Bag-valve-mask compression will take approximately 4 seconds.

**NOTES**

Allow for prolonged deflation, at least double the bag-valve-mask compression time.

Hyperventilation is contraindicated.
NEEDLE THORACENTESIS

This procedure is for the deteriorating critical patient who has a life-threatening tension pneumothorax.

MAY BE PERFORMED ON STANDING ORDER FOR TRAUMATIC ARREST AND TENSION PNEUMOTHORAX WITH SIGNS OF SHOCK.

REQUIRES ON-LINE MEDICAL DIRECTION FOR ALL OTHER SITUATIONS.

Indications:
1. Spontaneous or tension pneumothorax caused by chest trauma, and in PEA when pneumothorax is suspected as evidenced by:
   a. Absent breath sounds unilaterally
   b. Tracheal deviation
   c. Distended neck veins
   d. Subcutaneous emphysema
   e. If intubated, increased resistance to bag-valve compression
   f. Sustained hyperinflation to the effected side(s)
2. Traumatic arrest with suspected chest trauma

Contraindication:
- Vital signs not consistent with shock

Cautions
- Do not select a site for the procedure that is near a previous puncture site or thoracotomy scar.
- Use the largest (3–6 cm long) catheter over needle available since plugging can occur, usually a 14 gauge.

Equipment
1. 10 cc or 12 cc syringe with saline
2. 14 gauge over-the-needle catheter
3. Three way stopcock

Procedure:
1. Administer 100% oxygen, ensuring an open airway, ventilate as necessary.
2. Use an over the needle catheter or attach a saline filled syringe to the catheter.
3. Locate the second or third intercostal space in mid-clavicular line and prep with an antiseptic. The fourth intercostal space on the mid-axillary line is acceptable when the mid-clavicular line is not.
4. Insert the over-the-catheter needle perpendicular to the chest wall, above the rib, through the intercostal space, puncturing the parietal pleura, until escaping air is heard or bubbles are noted (in the saline filled syringe).
5. Remove the needle and attach a one-way flutter valve to the catheter hub.
6. Assess for adequacy of ventilations, look for chest rise and auscultate breath sounds.
7. Secure the catheter in place and bandage the site.

Complications:
- Intercostal artery injury – go above the rib to avoid this
- Local cellulitis
- Local hematoma
- Pleural infection
- Pneumothorax

NOTES
If little or no air is present, attach a three-way stopcock to prevent the development of a tension pneumothorax.
NASO/ORO GASTRIC TUBE

Indications

- Evacuation of air from the stomach to relieve gastric distention
- Reduce risk of aspiration and improve lung capacity
- Remove an ingested toxin.

Contraindications

- Severe facial or neck trauma
- Suspected basal skull fracture
- Comatose patient without airway protection
- Esophageal disease
- CNS bleed or injury
- History of gastric bypass surgery

Precautions

- This procedure can cause nasal or gastrointestinal hemorrhage.
- This procedure may increase intracranial pressure.
- The tube may be inadvertently passed into the trachea
- The tube can coil in the posterior pharynx.

Equipment

- NG tube
- 50 ml irrigation syringe
- Water soluble lubricant or lidocaine jelly
- 1” adhesive tape
- Suction equipment
- Emesis basin

Procedure

1. If the patient is conscious, explain the procedure and place the patient in a seated position if possible.
2. Assess the patient’s nose for deformity or obstruction. Select the nostril that appears to offer the least chance of resistance.
3. Measure the length of the tube to be inserted (distance from the tip of the patient’s nose to ear lobe to xiphoid process).
4. Lubricate the first 3 inches of the tube with the water-soluble or lidocaine jelly.
5. Insert the tube along the floor of the patient’s nostril and gently advance it toward the posterior pharynx until it reaches the predetermined depth. If the patient is conscious have them swallow on command to assist with the passage of the tube.
6. Verify tube placement by injecting 30 ml of air into the tube while auscultating the epigastrium. A rush of air indicates proper placement.
7. If proper placement is confirmed, secure the tube with the tape. If proper placement is not confirmed, remove the tube.

MAY BE PERFORMED ON STANDING ORDER FOR CARDIAC AND TRAUMATIC ARREST. (OPTIONAL SKILL) REQUIRES ON-LINE MEDICAL DIRECTION FOR ALL OTHER SITUATIONS.
OXYGEN THERAPY

All patients in respiratory distress should receive oxygen therapy. COPD patients given oxygen can have their respiratory drive suppressed and start retaining CO₂. Watch them closely and be prepared to assist with ventilations. **COPD patients** in shock or severe distress should receive 50-100% oxygen. COPD patients in moderate distress should receive oxygen via nasal cannula at 4-5 LPM. Otherwise COPD patients should receive 1-2 LPM via nasal cannula or the concentration that they are receiving with home O₂ therapy.

<table>
<thead>
<tr>
<th>Respiratory Status</th>
<th>Patient Presentation</th>
<th>Initial (\text{SpO}_2)</th>
<th>Equipment Flow Rate</th>
<th>Delivered Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO DISTRESS</td>
<td>Unlabored, normal respiration, warm, dry, pink skin</td>
<td>95-100%</td>
<td>None required</td>
<td></td>
</tr>
<tr>
<td>MILD DISTRESS</td>
<td>Slightly increased respirations, mild dyspnea associated with chest pain, asthma, or COPD</td>
<td>91-94%</td>
<td>Nasal Cannula 2-3 LPM</td>
<td>24-40%</td>
</tr>
<tr>
<td>MODERATE DISTRESS</td>
<td>Respiratory rate ~2 times normal, accessory muscle use, acrocyanosis: fingers, toes, and lips. All associated with trauma, chest pain, asthma/COPD, CVA</td>
<td>86-90%</td>
<td>Non-rebreather mask 15-25LPM</td>
<td>90% or greater</td>
</tr>
<tr>
<td>SEVERE DISTRESS</td>
<td>Shallow, labored respirations, cyanosis, poor respiratory effort. All sx. associated with shock, trauma, inhalation injury, and near drowning</td>
<td>&lt;86%</td>
<td>BVM, ETT/NTT</td>
<td>90-100%</td>
</tr>
<tr>
<td>RESPIRATORY ARREST</td>
<td>No respiratory effort</td>
<td>BVM, ETT/NTT or any other approved assisted ventilations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appendix A - Airway

December-2013

114
PULSE OXIMETRY

Indications
- Patients requiring or receiving supplemental oxygen
- Shortness of breath
- Respiratory distress of any type
- Chest pain
- Shock
- Patients requiring ventilatory assistance

Considerations
Factors that may result in inaccurate pulse oximetry readings include:
- Excessive motion
- Hypotension
- Vasoconstrictive drugs
- Nail polish
- Jaundice
- IV dyes
- Dyshemoblobinemias
- Smoke inhalation
- Too much ambient light

Documentation
- Oxygen saturation levels must be documented on the patient care report.
- Pre and post respiratory intervention saturation levels must be documented.
CAPNOGRAPHY

Indications
- Verify correct endotracheal tube placement and alert to inadvertent extubation
- Evaluate CPR efforts
- As an adjunct to assessment of ventilatory status of patients with respiratory diseases such as asthma, COPD and CHF.
- To monitor the ventilatory status of patients at risk for respiratory depression.

CAPNOGRAPHY MONITORING IS REQUIRED FOR ALL INTUBATED PATIENTS.

Intubated Patients
1. Monitor end tidal CO2 of all patients who are intubated with an endotracheal tube, LMA, King airway, or any other advanced airway.
2. Documentation
   - Document post intubation end tidal CO2 values on the patient care report.
   - Attach capnography waveform tracings to the patient care report.

Non-intubated Patients
1. Using nasal filter-lines, capnography may be used to assess and monitor the ventilatory status of non-intubated patients.
2. Capnography monitoring should be considered in patients with severe respiratory distress and those at risk for respiratory depression:
   a. CNS injury
   b. Sedation
   c. Seizure
   d. Narcotic overdoses
CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

Purpose
The application of continuous positive pressure by face mask in an alert and awake patient. The patient must be able to assist in his/her own medical care.

Indications
- Hypoxemia secondary to congestive heart failure and acute cardiogenic pulmonary edema in an adequately and spontaneously breathing patient as diagnosed by a present history of:
  - Dyspnea and tachypnea
  - Chest pain, hypertension and tachycardia
  - Anxiety, restlessness
  - Rales and often wheezes, frothy sputum (severe cases)

Contraindications
- Respiratory arrest
- Agonal respirations
- Altered mental status; inability to follow commands
- Shock/Hypotension (SBP <90 mmHg)
- Pneumothorax
- Penetrating chest trauma
- Severe nausea or any vomiting
- Evidence of sepsis or pneumonia
- Facial fractures, lacerations or anatomical incompatibility
- Recent gastroesophageal, bronchial or tracheal surgery
- History of COPD with any of the following: baseline O2 dependance, active or suspected COPD exacerbation, known pneumothorax or bleb history.

Procedure
1. Routine paramedic care
2. Monitor pulse oximetry
3. If B/P is < 90 mmHg contact medical control
4. Establish a rapport for patient cooperation
5. Start CPAP at ambient pressure ("0" cmH₂O)
6. Instruct the patient to slowly inhale through the nose and exhale through the mouth as long as possible (count out loud and slowly to four) then instruct the patient to exhale slowly.
7. Explain to the patient that you will begin to slowly increase the pressure and have the patient continue exhaling against the pressure as long as possible before inhaling.
8. Slowly titrate the pressure.
   a. Begin at 7.5 cmH₂O
   b. If no improvement increase to 10 cmH₂O
9. Treatment should be given continuously throughout transport to the Emergency Department
10. Monitor vital signs every 5 minutes
11. Notify the receiving hospital promptly that CPAP has been started and that a CPAP machine should be made ready for patient use upon arrival.
12. In the event of life-threatening complications:
   a. Stop the treatment
   b. Offer reassurance
   c. Initiate appropriate BLS and ALS interventions
   d. Immediately notify Medical Control and the ED staff prior to arrival and immediately upon arrival in the Emergency Department
13. Patient care report documentation must include:
   a. CPAP level FiO2 100%
   b. O₂ saturation level assessment every 5 minutes
   c. Vital sign assessment every 5 minutes
   d. Effects and adverse reactions
**KING LTS-D AIRWAY**

**Purpose:**

The KING LTS-D is designed for positive pressure ventilation over 30 cm H2O and spontaneously breathing patients, yet offers the unique ability to easily pass a gastric tube through a second channel of the airway and into the esophagus and stomach. The anatomically shaped distal tip and cuff, also exclusive to the KING LTS-D, assist in the airway’s passage behind the larynx and into the normally collapsed esophagus. The second lumen of the KING LTS-D, which is open at the distal tip of the tube, provides passage of gastric tube up to 18 French, a channel for regurgitation, which significantly reduces potential for regurgitation to get past the cuff and therefore aids in reducing the chance for aspiration, and provides a “vent” for gastric pressure and stomach decompression.

**Indications:**

- Apneic patient without a gag reflex where endotracheal intubation cannot be established after 2 attempts
- This airway may be considered the INITIAL airway of choice in the pulseless and apneic patient

**Cautions:**

- The KING LTS-D does not protect the airway against regurgitation and aspiration
- Intubation of the trachea cannot be ruled out as a potential complication

**Contraindications:**

- Patients who are conscious or who have an intact gag reflex
- Patients under 4 feet in height
- Patients with known esophageal disease (varicies, alcoholism, cirrhosis, etc.)
- Patients who have ingested a caustic substance

**KING Size Selection**

<table>
<thead>
<tr>
<th>Size</th>
<th>Description</th>
<th>Connector Color</th>
<th>Gastric Tube Size</th>
<th>Inflation Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4-5 feet in height</td>
<td>Yellow</td>
<td>≤ 18 F</td>
<td>50 ml</td>
</tr>
<tr>
<td>4</td>
<td>5-6 feet in height</td>
<td>Red</td>
<td>≤ 18 F</td>
<td>70 ml</td>
</tr>
<tr>
<td>5</td>
<td>&gt; 6 feet in height</td>
<td>Purple</td>
<td>≤ 18 F</td>
<td>80 ml</td>
</tr>
</tbody>
</table>

**Procedure**

1. Test cuff inflation system by injecting maximum recommended volume of air into the cuffs. Remove all air from cuffs before insertion.
2. Apply water-based lubricant to the beveled distal tip and posterior aspect of tube (avoid introducing lubricant into ventilator openings).
3. Pre-oxygenate.
4. Ensure gag reflex is not intact.
5. Position head in “sniffing” or neutral position.
6. Hold KING at the connector with dominant hand. With non-dominant hand, hold mouth open and apply chin lift.
7. With KING rotated laterally 45-90 degrees such that the blue orientation line is touching the corner of the mouth, introduce tip into the mouth and advance behind base of tongue. Never force tube into position.
8. As tube passes under tongue, rotate tube back to midline (blue orientation line faces chin).
9. Advance KING until proximal opening of gastric access lumen is aligned with teeth or gums.
10. Inflate cuffs with the minimum volume necessary to seal the airway.
11. Attach BVM to the 15mm connector of the KING and while gently bagging to assess ventilation, simultaneously withdraw the airway until ventilation is easy and free flowing.
12. While holding the KING in place until secured, confirm placement with auscultation, chest movement, and EtCO2.

13. The ResQPOD can be placed (unless contraindicated) onto the KING connector and then EtCO2 adaptor between the BVM.


15. DO NOT cover the proximal opening of the gastric access lumen.

16. The gastric access lumen allows the insertion of up to an 18 F gastric tube into the esophagus and stomach.

17. An appropriately sized cervical collar should be placed on the patient and the patient should be secured to a backboard, with CID, in order to restrict cervical spinal motion.

Added to Guidelines 2/2008
AIRTRAQ OPTICAL LARYNGOSCOPE

Purpose

The AIRTRAQ is a single-use laryngoscope designed to facilitate difficult intubation. It allows visualization of the airway during 100% of the intubation. It does not require hyperextension of the neck and permits intubating the patient in virtually any position.

THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.

Sizes

<table>
<thead>
<tr>
<th>Size</th>
<th>Color</th>
<th>ETT Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>Blue</td>
<td>7.0 – 8.5 mm</td>
</tr>
<tr>
<td>Small</td>
<td>Green</td>
<td>6.0 – 7.5 mm</td>
</tr>
</tbody>
</table>

Procedure

1. Turn on light using switch located on the left side of the eyepiece. Unit will flicker for 30-60 seconds until anti-fogging feature is fully activated.
2. Ensure ETT cuff is fully deflated.
3. Lubricate the ETT and place it into the lateral channel of the AIRTRAQ with the tip of the ETT aligned with the end of the lateral channel
4. Appropriately lubricate the AIRTRAQ without contacting the lens
5. Insert AIRTRAQ into the midline of the patient’s mouth, taking care to avoid pushing patient’s tongue toward the larynx
6. Slide the AIRTRAQ through the oropharynx keeping it midline
7. Before the AIRTRAQ reaches the vertical plane, begin looking through eyepiece to identify airway structures.
8. Continue insertion until epiglottis is identified. Place the tip of the AIRTRQ into the vallecula.
9. Gently lift up on the AIRTRAQ to expose the vocal cords. Alternatively, the tip can be placed under the epiglottis, lifting it out of the way.
10. Align vocal cords in the center of the visual field by gently moving the AIRTRAQ as needed.
11. Gently advance the ETT in the lateral channel until it is visualized passed through the vocal cords.
12. Inflate ETT cuff as normal and check for proper positioning.
13. Separate ETT from the AIRTRAQ by pulling it laterally from the ETT, while holding the ETT in position.

Added to Guidelines 2/2008
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### PARAMEDIC MEDICATION TRANSPORT LIST

Periodically a paramedic may be required to transport a patient to another facility in which a medication is being administered by continuous infusion. Paramedics’ credentialed through William W. Backus Hospital are permitted to transport the following medications without the availability of a R.N.:

<table>
<thead>
<tr>
<th>Activase (TPA)</th>
<th>Dobutamine</th>
<th>Nimbex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenosine</td>
<td>Dobamine</td>
<td>Nitroglycerine</td>
</tr>
<tr>
<td>Aggrastat</td>
<td>Epinephrine</td>
<td>Nitrous Oxide</td>
</tr>
<tr>
<td>Albuterol</td>
<td>Esmolol</td>
<td>Normal Saline</td>
</tr>
<tr>
<td>Aminophylline</td>
<td>Etomidate</td>
<td>Octreotide</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>Fentanyl</td>
<td>Phenylephrine</td>
</tr>
<tr>
<td>Amrinone (Inamrinone)</td>
<td>Glucagon</td>
<td>Potassium</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Heparin</td>
<td>Procainamide</td>
</tr>
<tr>
<td>Aspirin</td>
<td>Hyperalimentation</td>
<td>Propofol</td>
</tr>
<tr>
<td>Atropine</td>
<td>Insulin</td>
<td>Rocuronium</td>
</tr>
<tr>
<td>Benadryl</td>
<td>Integrilin (Epifbatide)</td>
<td>Sodium Bicarbonate</td>
</tr>
<tr>
<td>Blood/Blood products</td>
<td>Lasix</td>
<td>Solumedrol</td>
</tr>
<tr>
<td>Bumex</td>
<td>Levophed</td>
<td>Thiamine</td>
</tr>
<tr>
<td>Cardizem</td>
<td>Lidocaine</td>
<td>Total Parenteral Nutrition (TPN)</td>
</tr>
<tr>
<td>Cisatracurium</td>
<td>Lorazepam (Ativan)</td>
<td>Tridil</td>
</tr>
<tr>
<td>Demerol</td>
<td>Magnesium Sulfate</td>
<td>Vasopressin</td>
</tr>
<tr>
<td>Dextrose</td>
<td>Morphine</td>
<td>Vecuronium</td>
</tr>
<tr>
<td>Dilantin</td>
<td>Narcan</td>
<td>Vitamins</td>
</tr>
<tr>
<td>Dilaudid</td>
<td>Natrecor (Nesiritide)</td>
<td></td>
</tr>
</tbody>
</table>

- It is the responsibility of the Paramedic transporting the patient to obtain any necessary in-service (including effects and adverse effects of that medication.) and dosage administration orders (with range and dosage adjustment indications) for any medications not routinely carried by the Paramedic.
- **Before** leaving the facility with the patient, the paramedic must be sure they are comfortable with the medication being transported.
INTRANASAL MEDICATION ADMINISTRATION

The nasal route of medication administration offers several advantages. The nasal mucosa offers a convenient entry point into both the blood stream and the CSF. In certain medications the rates of absorption are relatively comparable to that of intravenous administration. This method of drug delivery is essentially painless, does not require a sterile technique, intravenous catheters or other invasive devices and is readily available to all patients.

**Special Considerations:**

- **Volume of delivery:** The nasal mucosa will become saturated if too large a volume of medication is applied to its surface. This results in run off out of the nose or into the back of the throat, reducing the amount of drug available for absorption.

- **Particle size:** Large drops of medication tend to run down into the throat and are not available for nasal absorption. Spray and atomized particles distribute more evenly over a larger surface area, making absorption more effective.

- **Concentration of medication:** If the drug that is administered is too dilute, then sufficient quantities of the drug will not be available for absorption. Concentrated solutions are more effective.

- **Damage to the nasal mucosa:** If the nasal mucosa is injured (i.e. trauma) or destroyed (i.e. chronic cocaine use) then reduced mucosal surface area exists, and it is unlikely that nasal drug delivery will be effective.

- **Upper Respiratory Infection/Secretions:** Patients with active upper respiratory infection who have large amounts of mucous secretions as well as those who are suffering a bloody nose will not absorb the medications as well because the medication will have difficulty contacting the nasal mucosa.

- **Perfusion:** Severe hypotension, severe vasoconstriction, etc will reduce blood flow to the nasal mucosa and may prevent adequate absorption.
INTRANASAL NALOXONE
Use of the Mucosal Atomization Device (MAD)

THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.

Indications:
- Respiratory depression following opiate use
- Respiratory arrest following opiate overdose
- Altered mental status of an unknown etiology

Special Considerations:
- It is preferable to use naloxone 1mg/ml concentration for nasal drug delivery. The less concentrated form requires higher volumes and may be less effective.
- If the patient fails to awaken following nasal naloxone, they may still respond to intravenous naloxone. Therefore, if an opiate overdose is suspected and the patient fails to awaken following intranasal narcan, naloxone should be administered intravenously.

Procedure:
1. Refer to the Altered Mental Status guideline, Medical Emergencies page 39.
2. Assess Airway, Breathing, Circulation
3. For pulseless patients, proceed to appropriate cardiac arrest guidelines, page 21.
4. For apnea with a pulse-establish an oral airway and begin bag-valve-mask ventilation with 100% oxygen.
5. Load syringe with 2 mg (2 ml) of naloxone and attach MAD nasal atomizer.
6. Place nasal atomizer 1.5 cm into the nostril
7. Briskly compress syringe to administer 1 ml of atomized narcan spray.
8. Remove and repeat in the other nostril so that all 2 ml (2 mg) of medication is administered.
9. Continue ventilating as needed.
10. If no arousal continue with Altered Mental Status Guideline on page 39:
    - Secure airway as necessary
11. If arousal does not occur within 2 minutes:
    - Establish an IV
    - Administer 2 mg narcan IV push
    - Continue with Altered Mental Status protocol
12. Establish Medical Control
INTRANASAL MIDAZOLAM
Use of the Mucosal Atomization Device (MAD)

THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.

Indications:
- Treatment of status epilepticus

Special Considerations:
- It is imperative to use Midazolam 5mg/ml concentration for nasal drug delivery. The less concentrated form requires higher volumes and may be less effective.
- If the patient fails to stop seizing following nasal midazolam, they may still respond to intravenous midazolam. Therefore, if the patient fails to stop seizing following intranasal midazolam, refer to the adult seizure guideline on page 47 or the pediatric seizure guideline on page 75.

Procedure:
1. Refer to the adult seizure guideline, Medical Emergencies page 47 or the pediatric seizure guideline, Pediatric Emergencies, page 75.
2. Assess Airway, Breathing, Circulation
3. For pulseless patients, proceed to appropriate adult cardiac arrest guidelines, page 21 or pediatric cardiac arrest guidelines, page 77.
4. Apply 100% oxygen to the patient
5. Use the age-based table to determine proper volume of Midazolam for atomization.

<table>
<thead>
<tr>
<th>Patient Age (yrs)</th>
<th>Weight (kg)</th>
<th>Intranasal Midazolam volume in ml. 5 mg/ml concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonate</td>
<td>3 kg</td>
<td>0.3 ml</td>
</tr>
<tr>
<td>&lt; 1 yr</td>
<td>6 kg</td>
<td>0.4 ml</td>
</tr>
<tr>
<td>1</td>
<td>10 kg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>2</td>
<td>14 kg</td>
<td>0.7 ml</td>
</tr>
<tr>
<td>3</td>
<td>16 kg</td>
<td>0.8 ml</td>
</tr>
<tr>
<td>4</td>
<td>18 kg</td>
<td>0.9 ml</td>
</tr>
<tr>
<td>5</td>
<td>20 kg</td>
<td>1.0 ml</td>
</tr>
<tr>
<td>6</td>
<td>22 kg</td>
<td>1.0 ml</td>
</tr>
<tr>
<td>7</td>
<td>24 kg</td>
<td>1.1 ml</td>
</tr>
<tr>
<td>8</td>
<td>26 kg</td>
<td>1.2 ml</td>
</tr>
<tr>
<td>9</td>
<td>28 kg</td>
<td>1.3 ml</td>
</tr>
<tr>
<td>10</td>
<td>30 kg</td>
<td>1.4 ml</td>
</tr>
<tr>
<td>11</td>
<td>32 kg</td>
<td>1.4 ml</td>
</tr>
<tr>
<td>12</td>
<td>34 kg</td>
<td>1.5 ml</td>
</tr>
<tr>
<td>Small Teen</td>
<td>40 kg</td>
<td>1.8 ml</td>
</tr>
<tr>
<td>Adult/Lg Teen</td>
<td>50 kg or more</td>
<td>2.0 ml</td>
</tr>
</tbody>
</table>

6. Load syringe with appropriate milliliter volume of Midazolam (use only 5 mg/ml concentration) and attach MAD nasal atomizer.
7. Place nasal atomizer 1.5 cm into the nostril
8. Briskly compress syringe to administer half of atomized dose of spray.
9. Remove and repeat in the other nostril so that all of the medication is administered.
10. Continue ventilating as needed.
11. If seizure persists after 5 minutes repeat nasal Midazolam at half dose.
12. Secure airway as necessary
13. Attempt IV while waiting 5 minutes for response
14. Go to IV dosing of valium or versed
15. Establish medical control
HORIZON Nxt™ PUMP OPERATION

Preparing the Pump:
1. Prime appropriate Horizon cassette tubing with IV fluid.
2. Open door of pump by pulling the door lever.
3. Position cassette over the Cassette Alignment Pins, close the downstream roller clamp.
4. Close the door to the pump and open all clamps on the pump set.

Standard Mode for Primary Fluids:
1. Press the Primary Indicator key.
2. Press the Data keys to enter the rate and volume.
3. Press the Primary Run key to start the infusion.
4. Press the Panel Lockout Switch to make the keys tamper proof, if desired.

Standard Mode for Piggyback Fluids:
Caution: Do not attempt to infuse both fluids simultaneously using this method.
1. Connect the piggyback set to the upper injection site (the site above the pump) on the primary set.
2. Lower the primary bag at least 8 inches.
3. Press the Piggyback Selection key.
4. Enter the piggyback rate and volume.
5. Press the Piggyback Run key.

Changing the Rate During Infusion (titration):
1. Press the Data keys to change the rate.
2. Press the Enter key or the Primary Run key to validate data. (If the Enter key or the Run key is not pressed within 4 seconds of entering a new rate, an error beep occurs. The pump will beep a total of 5 times before cancelling the changes rate)

Changing the Rate with the Pump on Hold:
1. Press the Hold key.
2. Press the Data keys to change the rate.
3. Press the Run key to start the infusion.

Clear Total Infused:
1. Press the Menu key.
2. Clear Total Infused is selected.
3. Press the Enter key.
# HORIZON Nxt™ PUMP TROUBLESHOOTING

<table>
<thead>
<tr>
<th>MESSAGE</th>
<th>LED MESSAGES</th>
<th>CORRECTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Very Low</td>
<td>Use AC</td>
<td>Plug into AC power NOW to continue operation</td>
</tr>
<tr>
<td>Container Empty</td>
<td>SOLU</td>
<td>IV container empty               Check upstream clamp                        Check for air in set Check cassette installation</td>
</tr>
<tr>
<td>Door Open</td>
<td>door</td>
<td>The door must be shut to deliver fluid</td>
</tr>
<tr>
<td>Downstream Occlusion</td>
<td>OCCL</td>
<td>Clamp closed or filter blocked       Tubing kinked                                IV positional or infiltrated Catheter or vein too small Check occlusion limit</td>
</tr>
<tr>
<td>Hold Time Exceeded</td>
<td>HOLD</td>
<td>Press Hold key, three minute time period is restarted</td>
</tr>
<tr>
<td>KVO</td>
<td>Flashing LED’s</td>
<td>Pump is operated in Keep Vein Open state Infusion is complete Set volume to be delivered Restart or turn off the pump</td>
</tr>
<tr>
<td>Low Battery</td>
<td>PLUG AC</td>
<td>Battery too low; plug in AC</td>
</tr>
<tr>
<td>System Error</td>
<td>SYS Err</td>
<td>Turn the pump off and return to the Bio-medical Department for service</td>
</tr>
<tr>
<td>See Help</td>
<td>SEE HELP</td>
<td>CLOSE ROLLER CLAMP, then open door. Press LOAD and reload tubing Cassette not in place</td>
</tr>
<tr>
<td>Set Piggyback Rate</td>
<td></td>
<td>Set a Piggyback rate</td>
</tr>
<tr>
<td>Set Piggyback Volume</td>
<td></td>
<td>Set a Piggyback volume</td>
</tr>
<tr>
<td>Set Primary Rate</td>
<td></td>
<td>Set a Primary rate</td>
</tr>
<tr>
<td>Set Primary Volume</td>
<td></td>
<td>Set a Primary volume</td>
</tr>
<tr>
<td>System Alarm</td>
<td></td>
<td>Press the Hold key</td>
</tr>
<tr>
<td>Upstream Occlusion</td>
<td>UP OCCL</td>
<td>Inadequate fluid flow to pump Upper clamp closed</td>
</tr>
</tbody>
</table>
ACTIVATED CHARCOAL

Class:
- Adsorbent

Mechanism of Action:
- Adsorbs toxic substances from the GI Tract; onset of action is immediate.

Indications:
- Most oral poisonings and medication overdoses; can be used after evacuation of poisons.

Contraindications:
- Oral administration to comatose patients:
- After ingestion of corrosives
- Caustics or petroleum distillates (ineffective and may induce vomiting)
- Simultaneous administration with other oral drugs.

Adverse Reactions:
May induce:
- Nausea and vomiting
- May cause constipation
- May cause black stools.

Drug Interactions:
- Bonds with and generally inactivates whatever it is mixed with, e.g., syrup of ipecac.

How Supplied:
- 25 gm (black powder) / 125 ml bottle (200 mg/ml)
- 50 gm (black powder) / 250 ml bottle (200 mg/ml)

Dosage and Administration:
Adult: 1 – 2 gm/kg PO or via NG Tube
Pediatric: 1 – 2 gm/kg PO or via NG Tube

NOTE
If not in pre-mixed slurry, dilute 1-part charcoal with 4-parts water.

Duration of Action:
- Depends on GI function; will act until excreted.

Special Considerations:
- Often used in conjunction with magnesium sulfate
- Must be stored in a closed container
- Does not adsorb cyanide, lithium, iron, lead, and arsenic

Appendix B - Medications

December-2013

129
ADENOSINE (ADENOCARD)

Class:
- Endogenous Nucleotide

Mechanism of Action:
- Slows conduction time through the AV Node.
- Can interrupt re-entrant pathways.
- Slows heart rate.
- Acts directly on sinus pacemaker cells.
- Can be used diagnostically for stable, wide-complex tachycardias of unknown type after two doses of Lidocaine.

Indications:
- Conversion of PSVT to sinus rhythm. May convert PSVT due to Wolfe-Parkinson-white syndrome. Not effective in converting A-Fib / Flutter.

Contraindications:
- Second or third-degree AV Block or sick sinus syndrome
- Ventricular Tachycardia
- Hypersensitivity to adenosine

Adverse Reactions:
- Facial flushing, shortness of breath, chest pain, headache, paresthesia, diaphoresis, palpitations, hypotension, nausea, metallic taste.

Drug Interactions:
- Methylxanthines (Theophylline-like drugs) antagonize the effects of adenosine
- Dipyridamole (Persantine) potentiates the effects of adenosine
- Carbamazepine (Tegretol) may potentiate the AV Node blocking effects of adenosine
- May cause broncho-constriction in asthmatic patients

How Supplied:
- Three mg/ml in 2-ml flip-top vials for IV injection

Dosage and Administration:
Adult: 6 mg over 1–3 seconds; If no response after 1-2 minutes, administer 12 mg over 1-3 seconds. Maximum total dose = 30 mg.

Pediatric: 0.1 – 0.2 mg/kg rapid IV. Maximum single dose = 12 mg.

NOTES
Rapid infusion close to the IV site with extremity elevated is mandatory. Rapid NaCl flush immediately following will assist rapid delivery to the heart.

Duration of Action:
- Onset and peak effects in seconds; duration 12 seconds.

Special Considerations:
- Short half-life limits side effects in most patients.
- Pregnancy
ALBUTEROL (PROVENTIL, VENTOLIN)

Class:
- Sympathomimetic, bronchodilator.

Mechanism of action:
- Selective beta-2 agonist that stimulates adrenergic receptors of the sympathomimetic nervous system resulting in smooth muscle relaxation in the bronchial tree and peripheral vasculature.

Indications:
- Treatment of bronchospasm in patients with reversible obstructive airway disease (COPD/Asthma).
- Prevention of exercise-induced bronchospasm.

Contraindications:
- Known prior hypersensitivity reactions to Albuterol.
- Tachycardia dysrhythmias, especially those caused by digitalis.
- Synergistic with other sympathomimetics.

Adverse reactions:
- Often dose-related and include restlessness, tremors, dizziness, palpitations, tachycardia, nervousness, peripheral vasodilatation, nausea, vomiting, hyperglycemia, increased blood pressure and paradoxical bronchospasm.

Drug Interactions:
- Tricyclic antidepressants may potentiate vasculature effects.
- Beta-blockers are antagonistic.
- May potentiate hypokalemia caused by diuretics.

How Supplied:
- Solution for aerosolization: 0.5% (5 mg/ml)
- Metered Dose Inhaler: 90 mcg/metered spray (17 gm canister with 200 inhalations)
- Syrup: 2 mg/5 ml

Dosage and Administration:
Adult: Administer 2.5 mg. Dilute 0.5 ml of 5% solution for inhalation with 2.5 ml NaCl in nebulizer and administer over 10-15 min.

MDI: 1-2 inhalations (90-180 mcg). Five minutes between inhalations.

Pediatrics: Administer solution of 0.01 – 0.03 ml (0.05 – 0.15 mg/kg) and dose diluted in 2 ml of 0.9% NaCl. May repeat every 20 minutes three times.

Duration of Action:
- Onset in 5-15 minutes with peak effect in 30 minutes – two hours and duration of 3-4 hours.

Special Considerations:
- Antagonized by beta-blockers (e.g., Inderal, Lopressor).
- May precipitate angina pectoris and dysrhythmias.
- Should only be administered by inhalation in pre-hospital management.
AMIODARONE (CORDARONE)

Class:
- Antidysrhythmic

Mechanism of Action:
- Prolongation of action potential; non-competitive alpha and beta sympathetic blocking effects; Calcium channel blocking effects.

Indications:
- Suppression of ventricular fibrillation refractory to defibrillation and Lidocaine.
- Suppression of ventricular tachycardia refractory to cardioversion and Lidocaine.

Contraindications:
- Second or third degree heart block.
- Medication-induced ventricular dysrhythmias
- Hypotension
- Bradycardia
- Torsades de Pointes
- Profound sinus bradycardia

Adverse reactions:
- Hypotension
- Bradycardia
- Pulseless electrical activity
- Congestive heart failure
- Nausea
- Fever
- Abnormal liver function tests
- Thrombocytopenia

Drug Interactions:
- Will precipitate with Sodium Bicarbonate: incompatible
- Compatible with: Bretylium, Dopamine, Dobutamine, Isoproterenol, Lidocaine, NTG, Norepinephrine, Phenylephrine, KCL, and Procainamide.

How supplied:
- 150 mg in 3 ml vials.

Dosage and administration:
Adult: VF/VT Cardiac Arrest: 300 mg IV/IO push. May give second dose of 150 mg IV/IO push.
   Rapid Infusion: 150 mg in 100 ml bag of D5W. Infused over 10 minutes

Duration of action:
- Onset within 5-15 minutes
- Peak effect: Variable
- Duration: Variable.

Special considerations:
- Maintain at room temperature and protect from light in storage (light protection not required during administration).
- Hypotension usually responsive to slowing infusion rate, IV NaCl.
- Administer cautiously in patients with heart failure or poor systolic function.
- May be especially effective in high-risk patients with recent acute MI.
**AMYL NITRATE, SODIUM NITRATE, SODIUM THIOSULFATE (CYANIDE ANTIDOTE KIT)**

**Class:**
- Antidote

**Mechanism:**
- Amyl Nitrate: affinity for cyanide ions; reacts with hemoglobin to form methemoglobin (low toxicity)
- Sodium Nitrate: same as Amyl Nitrate
- Sodium Thiosulfate: produces thiocyanate, which is then excreted

**Indications:**
- Cyanide or hydrocyanic acid poisoning.

**Contraindications:**
- Not Applicable.

**Adverse reactions:**
- Excessive doses of Amyl Nitrate and Sodium Nitrate can produce severe, life threatening methemoglobinemia. Use only recommended doses.

**Drug Interactions:**
- None.

**How supplied:**
- Amyl Nitrate: in pledgettes similar to ammonia capsules.

**Dosage and administration:**
**Adult:** Amyl Nitrate: breathe 30 seconds out of every minute. Sodium Thiosulfate and Sodium Nitrate: IV per antidote kit directions.

**Pediatric:** Same as adult.

**Duration of action:**
- Variable.

**Special Considerations:**
- Cyanide poisoning must be recognized quickly and treated quickly; if pulse persists, even in the presence of apnea, prognosis is good with treatment. The antidote kit must be used in conjunction with administration of oxygen.
**ASPIRIN**

**Class:**
- Platelet inhibitor, anti-inflammatory agent.

**Mechanism of action:**
- Prostaglandin inhibition.

**Indications:**
- New onset chest pain suggestive of Acute Myocardial Infarction.
- Signs and symptoms suggestive of recent cerebrovascular accident.

**Contraindications:**
- Hypersensitivity.
- Gastrointestinal bleeding.

**Adverse Reactions:**
- Heartburn
- GI bleeding
- Nausea, vomiting
- Wheezing in allergic patients
- Prolonged bleeding

**Drug Interactions:**
- Use with caution in patients allergic to NSAIDs.

**How supplied:**
- 81 mg, 160 mg or 325 mg tablets (chewable and standard).

**Dosage and Administration:**
- 324 mg PO. Given as four, 81 mg tablets chewed and swallowed.

**Duration of Action:**
- Onset: 30-45 minutes.
- Peak effect: Variable
- Duration: Variable

**Special Considerations:**
- Not recommended in pediatric patients.
**ATROPINE SULFATE**

**Class:**
- Anticholinergic agent.

**Mechanism of Action:**
- Parasympatholytic: inhibits action of acetylcholine at postganglionic parasympathetic neuroeffector sites.
- Increases heart rate in life-threatening bradydysrhythmias.

**Indications:**
- Hemodynamically significant bradycardia.
- Drug of choice for organophosphate poisoning.
- Bronchospastic pulmonary disorders
- Pre-medication for children under 10 in preparation for sedation assisted intubation.

**Contraindications:**
- Tachycardia
- Hypersensitivity
- Unstable cardiovascular status in acute hemorrhage and myocardial ischemia
- Narrow-angle glaucoma

**Adverse Reactions:**
- Headache
- Dizziness
- Palpitations
- Nausea / vomiting
- Tachycardia
- Dysrhythmias
- Anticholinergic effects (blurred vision, dry mouth, urinary retention)
- Paradoxical bradycardia when pushed slowly or at low doses
- Flushed, hot, dry skin

**Drug Interactions:**
- Potential adverse effects when administered with digoxin, cholinergics, physostigmine.
- Effects enhanced by antihistamines, procainamide, quinidine, antipsychotics, benzodiazepines, and antidepressants.

**How Supplied:**
- Prefilled syringes: 1 mg in 10 ml of solution.
- Nebulizer: 0.2% (1 mg in 0.5 ml) and 0.5% (2.5 mg in 0.5 ml).

**Dosage and Administration:**
**Adult:** Bradydysrhythmias: 0.5 mg IV every 3-5 minutes as needed to a maximum total dose 3.0 mg.

**Pediatric:** Bradydysrhythmias: 0.02 mg/kg (may repeat once.) Minimum dose 0.1mg and maximum dose 0.5 mg

**Sedation Assisted Intubation:** Children under 10, only 0.02 mg/kg one time only.

**Duration of Action:**
- Onset: Immediate
- Peak effect: Rapid to 1-2 minutes
- Duration: 2-6 hours

**Special Considerations:**
- Moderate doses dilate pupils
BUMETANIDE (BUMEX)

Class:
- Cardiovascular agent
- Loop diuretic

Mechanism of Action:
- Used to reduce the swelling and fluid retention caused by various medical problems, including heart or liver disease. It also is used to treat high blood pressure. It causes the kidneys to get rid of unneeded water and salt from the body into the urine.

Indications:
- Edema

Contraindications:
- Anuria
- Hepatic coma
- Hypersensitivity
- Electrolyte depletion

Adverse Reactions:
- Hypotension
- Hyperuricemia
- Palpitations
- Nausea
- Hypokalemia
- Dizziness/Headache

Drug Interactions:
- Potential adverse reactions may occur with corticosteroids (e.g., prednisone), digoxin (Lanoxin), indomethacin (Indocin), lithium (Eskalith, Lithobid), probenecid (Benemid), and vitamins.

How Supplied:
- Vial: 0.25 mg/ml. Maximum dose: 10 mg/day.

Dosage and Administration:
- Adult: 
  - Edema: 0.5-1 mg IV or IM over 1-2 minutes.

  Pediatric: Not recommended

Duration of Action:
- Onset: 5 minutes
- Peak effect: Rapid to 1-2 minutes
- Duration: 2-6 hours
CALCIUM CHLORIDE

Class:
- Electrolyte

Mechanism of Action:
- Facilitates the actin/myosin interaction in the heart muscle.

Indications:
- Hypocalcemia
- Hyperkalemia with arrhythmia
- Calcium channel blocker toxicity with hypotension or symptomatic bradycardia

Contraindications:
- Not to be mixed with any other medications – precipitates easily.

Adverse reactions:
- Cardiac arrhythmias
- Precipitation of digitalis toxicity

Drug Interactions:
- Not to be mixed with any other medications – precipitates easily.

How Supplied:
- 10% solution in a 10 ml pre-filled syringe

Dosage and Administration:
Adult: 1 gm over 5 minutes for hemodynamically unstable bradycardia induced by Calcium channel blocker toxicity.

Duration of Action:
- Onset: 5-15 minutes
- Peak effect: variable
- Duration: up to 4 hours after administration

Special Considerations:
Patients receiving calcium must have cardiac monitoring.
DEXTROSE 50%

Class:
- Carbohydrate, hypertonic solution.

Mechanism of Action:
- Rapidly increases serum glucose levels.
- Short term osmotic diuresis

Indications:
- Hypoglycemia
- Altered level of consciousness
- Coma of unknown etiology
- Seizure of unknown etiology
- Status epilepticus (controversial)

Contraindications:
- Intracranial hemorrhage
- Delirium tremens

Adverse reactions:
- Extravasation leads to tissue necrosis
- Warmth, pain, burning
- Thrombophlebitis
- Rhabdomyositis

Drug Interactions:
- Sodium bicarbonate
- Coumadin

How Supplied:
- 25 gm/50 ml prefilled syringes (500 mg/ml)

Dosage and Administration:
Adult: 12.5-25 gram slow IV, may be repeated as necessary.

Pediatric: 0.5-1 gm/kg/dose slow IV, may be repeated as necessary.

Duration of Action:
- Onset: less than 1 minute
- Peak effect: variable
- Duration: variable

Special Considerations:
- Administer Thiamine prior to D50 in known alcoholic patients.
- Obtain a blood glucose level before administering.
- Do not administer to patients with known CVA unless hypoglycemia documented.
- Ineffective without thiamine
- No indication in the cardiac arrest patient
DIAZEPAM (VALIUM)

Class:
- Benzodiazepine, sedative-hypnotic, anticonvulsant

Mechanism of Action:
- Potentiates effects of inhibitory neurotransmitters.
- Raises seizure threshold.
- Induces amnesia and sedation.

Indications:
- Acute anxiety states, Acute alcohol withdrawal, Muscle relaxant, Seizure activity
- Sedation for medical procedures (fracture reduction, cardioversion)
- Delirium tremens

Contraindications:
- Hypersensitivity
- Glaucoma
- Coma
- Shock

Adverse reactions:
- Respiratory depression
- Hypotension
- Drowsiness
- Ataxia
- Reflex tachycardia
- Nausea
- Confusion
- Thrombosis and phlebitis

Drug Interactions:
- Incompatible with most drugs and fluids.

How Supplied:
- 10 mg/5 ml prefilled syringes, ampules, vials and Tubex.

Dosage and Administration:
Adult Seizure: 5-10 mg IV, repeat 10-15 minutes prn (5 mg over 5 minutes)
Maximum dose of 30 mg

Pediatric Seizure: 0.25 mg/kg dose IV every 15-30 minutes (slow IVP) Maximum dose 10 mg. Rectal Diazepam: 10 mg via 2” rectal catheter and flush with 2-3 ml air after administration.

Sedation for cardioversion: 5-15 mg IV over 5-10 minutes prior to cardioversion.

Duration of Action:
- Onset: 1-5 minutes
- Duration: 20-50 minutes

Special Considerations:
- Short duration of anticonvulsant effect
- Reduce dose 50% in elderly patients
DIGOXIN (LANOXIN)

Class:  
- Inotropic agent

Mechanism of Action:  
- Rapid-acting glycoside with direct and indirect effects that increase force of myocardial contraction, increase refractory period of AV node and increase peripheral resistance.

Indications:  
- Congestive heart failure  
- PSVT, especially Atrial Flutter and Atrial Fibrillation

Contraindications:  
- Ventricular Fibrillation  
- Ventricular Tachycardia  
- Digitalis Toxicity  
- Hypersensitivity to Digoxin

Adverse Reactions:  
- Headache  
- Weakness  
- Blurred yellow or green vision  
- Confusion  
- Seizures  
- Dysrhythmias  
- Nausea / vomiting  
- Skin rash

Drug Interactions:  
- Amiodorone, Verapamil, and Quinidine may increase serum Digoxin concentrations by 50-70%.  
- Concurrent use Digoxin and Verapamil may lead to severe heart blocks.  
- Diuretics may potentiate cardiac toxicity.

How Supplied:  
- 2 ml ampules of 0.5 mg Digoxin, tablets, capsules, and elixirs

Dosage and Administration:  
Adult: 0.25 – 0.5 mg slow IV push.

Pediatric: 25 – 40 mcg/kg slow IV push.

Duration of Action:  
- Onset: IV: 5 – 30 minutes   PO: 30-120 minutes  
- Duration: several days.

Special considerations:  
- Patients receiving Digoxin must be on monitor  
- Patients with known renal failure are prone to Digoxin Toxicity  
- Hypokalemia, hypomagnesemia, and hypercalcemia potentiate Digitalis Toxicity  
- Use carefully in patients with WPW Syndrome
DILTIAZEM HCL (CARDIZEM, LYO-JECT)

Class:
- Calcium channel blocker.

Mechanism of Action:
- Blocks the influx of calcium ions into the cardiac muscle.
- Prevents spasm of coronary arteries.
- Arterial venous vasodilator.
- Reduces preload and afterload.
- Reduces myocardial oxygen demand.

Indications:
- Control of rapid ventricular rates due to atrial flutter, atrial fibrillation, PSVT.

Contraindications:
- Hypotension, cardiogenic shock
- Drug induced tachycardia, tachycardia secondary to poisoning
- Wolfe-Parkinson White Syndrome
- Second or third degree AV blocks
- Wide complex tachycardias

Adverse Reactions:
- Bradycardia, second or third degree AV blocks, ventricular fibrillation, ventricular tachycardia
- Chest pain, congestive heart failure, syncope, nausea, vomiting, dizziness, dry mouth, dyspnea, headache

Drug Interactions:
- Caution in patients using medications that affect cardiac contractility. They should be used with caution on patients taking beta blockers: Atenolol (Tenormin), Labetalol (Normadyne Trandate), Propranolol (Inderal), and Metoprolol (Lopressor).

How Supplied:
- 25 mg / 5 ml vial or 50 mg / 10 ml vial.
- Non-refrigerated: LYO-JECT syringe.

Dosage:
Adult:
- Initial bolus, 0.25 mg/kg (average dose is 20 mg) IV over two (2) minutes.
- If inadequate response, may re-bolus in 15 minutes: 0.35 mg/kg IV over two (2) minutes.
- Maintenance infusion: 5-15 mg/hour.

Pediatric: NOT Recommended.

Duration of Action:
- Onset: 2-5 minutes.
- Peak: Variable
- Duration: 1-3 hours.

Special Considerations:
- Use in caution with patients with renal failure or hepatic dysfunction.
- PVCs may be noted at the time of conversion of PSVT to sinus rhythm.
**DIPHENHYDRAMINE (BENADRYL)**

**Class:**
- Antihistamine; anticholinergic.

**Mechanism of Action:**
- Blocks cellular histamine receptors
- Decreases vasodilation
- Decreases motion sickness
- Reverses extrapyramidal reactions

**Indications:**
- Symptomatic relief of allergies
- Allergic reactions
- Anaphylaxis
- Acute dystonic reactions (phenothiazines)
- Blood administration reactions; used for motion sickness and hay fever

**Contraindications:**
- Glaucoma
- Hypertension
- Narrow angle glaucoma
- Infants
- Patients taking Monoamine Oxidase Inhibitors

**Adverse Reactions:**
- Sedation
- Hypotension
- Urinary retention
- Seizures
- Palpitations
- Visual disturbances
- Dysrhythmiass
- Vomiting
- Dry mouth and throat
- Paradoxical CNS excitation in children
- Paradoxical CNS excitation in children

**Drug Reactions:**
- Potentiates effects of alcohol and other anticholinergics.
- May inhibit corticosteroid activity
- MAOIs prolong anticholinergic effects of diphenhydramine

**How Supplied:**
- 50 or 100 mg prefilled syringes, vials (IV or IM)
- Elixir: 12.5 mg/5 ml

**Dosage and Administration:**
**Adult:** 25-50 mg IM or IV.

**Pediatric:** 1mg/kg IV, IO slowly, or IM. If given PO: 5 mg/kg/24 hours.

**Duration of Action:**
- Onset: 15-30 minutes
- Peak: 1 hour
- Duration: 3-12 hours

**Special Considerations:**
- Not used in infants or in pregnancy
- If used in anaphylaxis, it will be in conjunction with epinephrine, steroids.
DOPAMINE HYDROCHLORIDE

Class:
- Naturally occurring catecholamine, adrenergic agonist with alpha 1, beta 1, beta 2 and dopaminergic effects.

Mechanism of Action
- Chemical precursor of norepinephrine
- Primarily effects heart and arterial systems
- Effects are dependent upon the dose administered
  - At doses of 1-2 mcg/kg/min it dilates mesenteric, cerebral and renal blood vessels. An increase in heart rate or cardiac output may not be noticed.
  - At doses of 2-6 mcg/kg/min dopamine has beta 1 stimulating effects on the heart, increasing heart rate and cardiac output
  - At dose greater than or equal to 6-10 mcg/kg/min dopamine exhibits alpha 1 stimulating effects on the vasculature, resulting in peripheral vasoconstriction, possible renal artery constriction and increases in left and right ventricular preload.
  - At doses greater than or equal to 10 mcg/kg/min alpha 1 stimulating effects may reverse the mesenteric and artery dilation and result in decreased mesenteric and renal blood flow. Alpha 1 effects are seen, resulting in increased blood return to the heart and increases in preload.

Indications
- Cardiogenic shock
- Septic shock
- Anaphylactic shock
- Hypovolemic shock, after sufficient volume replacement

Potential Side Effects
- Tachydysrhythmias
- Hypertension

Dosage/Route
Adult: Begin intravenous infusion at 5 –10 mcg/kg/min and titrate to desired blood pressure.

Pediatric: Begin intravenous infusion at 5 –10 mcg/kg/min and titrate to desired blood pressure.
**EPINEPHRINE (ADRENALINE)**

**Class:**
- Sympathomimetic

**Mechanism of Action:**
- Direct acting alpha and beta agonist
- Alpha: bronchial, cutaneous, renal, and visceral arteriolar vasoconstriction
- Beta 1: positive inotropic and chronotropic actions, increases automaticity
- Beta 2: bronchial smooth muscle relaxation and dilation of skeletal vasculature
- Blocks histamine release

**Indications:**
- Cardiac arrest
- Asystole, PEA, VF and pulseless VT unresponsive to initial defibrillation.
- Severe bronchospasm, asthma, bronchiolitis
- Anaphylaxis, acute allergic reactions
- Bradycardia in the pediatric patient
- Symptomatic bradycardia in adults after atropine, TCP and dopamine

**Precautions:**
- Hypertension
- Dysrhythmias
- Pulmonary edema
- Coronary insufficiency

**Adverse Reactions:**
- Hypertension
- Dysrhythmias
- Pulmonary edema
- Anxiety
- Psychomotor agitation
- Nausea
- Angina
- Headache
- Restlessness

**Drug Interactions:**
- Potentiates other sympathomimetics
- Inactivated by alkaline solutions
- MAOIs and Bretylium may potentiate effects of epinephrine

**How Supplied:**
- 1 mg/ml (1:1000), 0.1 mg/ml (1:10,000) ampules and prefilled syringes
- Auto-injector EPI-pen 0.5 mg/ml (1:2000)

**Dosage and Administration:**

**Adult:**
- **Allergic reactions and Asthma:** 0.3-0.5 mg (0.3-0.5 ml 1:1000) IM
- **Anaphylaxis:** 0.3-0.5 mg (3-5 ml 1:10,000) IV
- **Cardiac Arrest:** 1 mg IV push every 3-5 minutes.

**Pediatric:**
- **Allergic reactions:** 0.01 mg/kg (0.1 ml/kg) SC to a maximum of 0.1 mg
- **Asthma:** 0.01 mg/kg SC to a maximum of 0.3 mg.
- **Croup:** 5 mg nebulized with 2.5-3 ml of normal saline
- **Cardiac Arrest:** 0.01mg/kg (1:10,000) IV/ IO If IV/IO access not available but ET tube in place, may give ET dose 0.1 mg/kg (0.1 ml/kg of 1:1000.)

**Continuous infusion: (Brady cardia refractory to other interventions)**

**Adult:** 2-10 mcg/min. (1:1000 in 500 ml NaCl or D5W)

**Pediatric:**

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

**Duration of action:**

- Onset: Immediate
- Peak: Minutes
- Duration: Several minutes

**Special Considerations:**

- Pregnancy
- Syncope in asthmatic children
- If given ET, may dilute in sterile NaCl (10 ml in adults)
- Ineffective in an acidotic patient
ETOMIDATE

Class:
- General anesthetic

Mechanism of Action:
- The primary action on the central nervous system is hypnosis without analgesia.

Indications:
- Induction of general anesthesia

Contraindications:
- Hypersensitivity

Precautions:
- Hypotension
- Asthma

Adverse Reactions:
- Hypotension
- Myclonus
- Nausea/vomiting
- Pain at injection site

Drug Reactions:
- Avoid use if patient takes St. John’s Wort

How Supplied:
- 20 mg in 10 ml vials or (2mg/ml)

Dosage and Administration:
Adult: 0.3 mg/kg over 30-60 seconds

Pediatric: Not recommended in children under 10 years of age.

Duration of Action:
- Onset: 30-60 seconds
- Peak: Variable
- Duration: 3-5 minutes

Special Considerations:
- Not used in infants or in pregnancy
FENTANYL

Class:
- Synthetic narcotic analgesic

Mechanism of Action:
- Decreases pain, perception, and anxiety

Indications:
- Moderate to severe pain in adults

Contraindications:
- Significant head injury
- GCS <13 (unless being utilized in Post Sedation Assisted Intubation Management.)
- Systolic BP >90 (unless being utilized in Post Sedation Assisted Intubation Management.)
- Allergy to Fentanyl

Adverse Reactions:
- Respiratory depression or arrest
- Decreased LOC
- Hypotension
- Increased vagal tone (decreased heart rate)
- Nausea/vomiting
- Increased cerebral blood flow
- Urticaria
- Chest wall rigidity

Drug Interactions:
- Increased potential for respiratory depression when co-administered with other respiratory depressants

How Supplied:
- 50 mcg/ml vial

Dosage and administration:
Adult: 1 mcg/kg given IV over 3-5 minutes. Maximum dose of 50 mcg. If no IV access, may be administered intranasal at 1.5 mcg/kg. Maximum dose of 100 mcg.
Pediatric: Contact medical control

Duration of Action:
- Onset: Immediate
- Peak: Minutes
- Duration: 30-60 minutes

Special Considerations:
- Rapid administration increases likelihood of adverse effects
- Age >65 divide dose into 2 doses, given 5 minutes apart
**FUROSEMIDE (LASIX)**

**Class:**
- Loop diuretic

**Mechanism of Action:**
- Inhibits electrolyte reabsorption and promotes excretion of sodium, potassium and chloride.

**Indications:**
- Congestive heart failure
- Pulmonary edema
- Hypertensive crisis
- Increased intracranial pressure

**Contraindications:**
- Hypovolemia
- Anuria
- Hypotension (relative contraindication)
- Hypersensitivity
- Hepatic coma

**Adverse Reactions:**
- May exacerbate hypovolemia
- Hypokalemia
- EKG changes
- Dry mouth
- Hypochloremia
- Hyponatremia
- Hyperglycemia (due to hemoconcentration)

**Drug Interactions:**
- Lithium toxicity may be potentiated by sodium depletion.
- Digitalis toxicity may be potentiated by potassium depletion.

**How Supplied:**
- 100 mg/5 ml, 20 mg/2 ml, 40 mg/4 ml vials

**Dosage and administration:**
- **Adult:** 0.5-1 mg/kg injected slowly IV. Maximum dose 40 mg
- **Pediatric:** 1 mg/kg/ IV; IO slowly

**Duration of Action:**
- Onset: 5 minutes
- Peak: 20-60 minutes
- Duration: 4-6 hours

**Special Considerations:**
- Pregnancy
- Ototoxicity and deafness can occur with rapid administration.
- Should be protected from light.
**GLUCAGON**

**Class:**
- Hyperglycemic agent, pancreatic hormone, insulin antagonist.

**Mechanism of Action:**
- Increases blood glucose by stimulating glucogenesis
- Unknown mechanism of stabilizing cardiac rhythm in beta-blocker overdose
- Minimal positive inotrope and chronotrope
- Decreases GI motility and secretions

**Indications:**
- Altered level of consciousness when hypoglycemia is suspected
- May be used as inotropic agent in beta-blocker and calcium channel blocker overdoses

**Contraindications:**
- Hyperglycemia
- Hypersensitivity

**Adverse Reactions:**
- Nausea/vomiting
- Tachycardia
- Hypertension

**Drug Interactions:**
- Incompatible in solution with most other substances.
- No significant drug interactions with other emergency medications.

**How Supplied:**
- 1 mg ampules (requires reconstitution with diluent provided)

**Dosage and Administration:**
**Adult:** Hypoglycemia: 1 mg IM. May repeat q 20 minutes PRN.
Beta Blocker Toxicity: 2 mg IVP.

**Pediatric:** 1.0 mg IM.

**Duration of Action:**
- Onset: 1 minute
- Peak effect: 30 minutes
- Duration: Variable (generally 9-17 minutes)

**Special Considerations:**
- Pregnancy
- Ineffective if glycogen stores are depleted
- Should be used in conjunction with 50% Dextrose whenever possible.
- If the patient does not respond to the second dose, 50% Dextrose must be administered.
GLUCOSE – ORAL (GLUCOLA, INSTA-GLUCOSE)

Class:
- Hyperglycemic

Mechanism of Action:
- Provides quickly absorbed glucose to increase blood glucose levels.

Indications:
- Conscious patients with suspected hypoglycemia.

Contraindications:
- Decreased level of consciousness
- Nausea / vomiting

Adverse Reactions:
- Nausea / vomiting

Drug Interactions:
- None.

How Supplied:
- Glucola: 300 ml bottles
- Glucose: various forms of pastes and gels.

Dosage and Administration:
Adult: Should be sipped by the patient until clinical improvement noted.

Pediatric: Same as adult

Duration of Action:
- Onset: Immediate
- Peak effect: Variable
- Duration: Variable

Special Considerations:
- As noted under indications.
HYDROMORPHONE HYDROCHLORIDE (DILAUDID)

Class:
- Synthetic narcotic analgesic

Mechanism of Action:
- Decreases pain and anxiety

Indications:
- Moderate to severe pain in adults

Contraindications:
- Allergy to Hydromorphone Hcl

Adverse Reactions:
- Respiratory depression or arrest
- Decreased LOC
- Hypotension
- Nausea/vomiting

Drug Interactions:
- Increased potential for respiratory depression when co-administered with other respiratory depressants

How Supplied:
- 2 mg/ml

Dosage and administration:
Adult: 2 mg slow IV or IM
Pediatric: .01 mg/kg slow IV or IM

Duration of Action:
- Onset: Minutes
- Peak: Minutes
- Duration: Hours

Special Considerations:
- Rapid administration increases likelihood of adverse effects
INAMRINONE (AMRINONE)

Class
- Inotrope, vasodilator

Mechanism of action:
- Phosphodiesterase inhibitor with positive inotropic and vasodilator activity.

Indications:
- Severe acute congestive heart failure refractory to other treatment modalities.

Contraindications:
- Hypersensitivity
- Hypotension
- Renal insufficiency

Adverse reactions:
- Thrombocytopenia
- Arrhythmia
- Chest Pain
- Hypotension
- Headache
- Lightheadedness
- Metabolic acidosis
- Hyperthermia
- Hypokalemia

How supplied:
- 100 mg vial and premixed with normal saline for infusion.

Dosage and administration:
**Adult:** 0.75 mg/kg intravenous bolus over 2-3 minutes.
  Maintenance infusion from 5 to 10 mcg/kg/min.

**Pediatric:** 0.75 mg/kg intravenous bolus over 5 minutes.
  Maintenance infusion at 5 mcg/kg/min.

Duration of onset:
- Onset: 5 to 10 minutes
- Peak effect: 10 minutes
- Duration: Variable
INTEGRILIN (EPTIFIBATIDE)

Class
- Glycoprotein IIb/IIIa inhibitor
- Platelet aggregation inhibitor

Mechanism of action:
- Glycoprotein antagonist for use during acute thrombotic events.

Indications:
- Acute coronary syndrome

Contraindications:
- Abnormal bleeding
- Planned administration of other glycoprotein inhibitors
- Hypersensitivity
- Major surgery in past 6 weeks
- Renal dialysis
- Stroke
- Severe hypertension

Adverse reactions:
- Hypotension
- Bleeding

How supplied:
- Intravenous solution: 0.75 mg/ml or 2 mg/ml

Dosage and administration:
**Adult:** IV bolus 180 mcg/kg (maximum 22.6 mg) followed by 2 mcg/kg/min (maximum 15 mg/hr) infusion.

**Pediatric:** Not recommended

Duration of onset:
- Onset: 1 hour
- Peak: 2 hours
- Duration: 4 hours
IPRATROPIUM BROMIDE (ATROVENT)

Class
- Bronchodilator, anticholinergic

Mechanism of action:
- Ipratropium is an anticholinergic agent.

Indications:
- Ipratropium inhalation is useful primarily in the long-term treatment of chronic obstructive pulmonary disease (COPD), chronic bronchitis and emphysema as well as in asthmatic patients.

Contraindications:
- Hypersensitivity to ipratropium products
- Hypersensitivity to soya lecithin, soybeans, peanuts or related food products

Adverse reactions:
- Dry mouth
- Bitter taste
- Epistaxis
- Nasal dryness
- Nasal congestion

How supplied:
- Premixed with albuterol as a solution for aerosolization

Dosage and administration:
**Adult:** 6.0 mg albuterol sulfate and 0.5 mg ipratropium bromide (6 ml) by aerosol over 10-15 minutes

**Pediatric:** Currently not administered prehospital.

Duration of onset:
- Onset occurs in 5-30 minutes with peak effect in 1-2 hours and duration of 3-4 hours.
KETAMINE

Class:
- Anesthetic

Mechanism of Action:
- Ketamine has a direct action on the cortex and limbic system. It produces a cataleptic-like state where the patient is withdrawn from the surrounding environment.

Indications:
- Procedural sedation (intubation)

Contraindications:
- Conditions where a significant increase in blood pressure would be a serious hazard.
- Known hypersensitivity to Ketamine.

Adverse Reactions:
- Anaphylaxis
- Respiratory depression/apnea
- Bradyarrhythmias
- Cardiac dysrhythmias
- Hypertension
- Laryngeal spasms
- Pulmonary edema

Drug Interactions:
- No significant drug interactions with other emergency medications.

How Supplied:
- 50 mg/ml in 10 ml vial
- 100 mg/ml in 5 ml vial (this concentration must be mixed with equal amount of saline or sterile water for injection.)

Dosage and Administration:
Adult: 2 mg/kg IV
Pediatric: 1.5 mg/kg IV

Duration of Action:
- Onset: 1-3 minutes
- Peak effect: Minutes
- Duration: 15 minutes

Special Considerations:
- Vomiting may occur, risk of aspiration
LIDOCAINE HCL (2%)

Class:
- Antidysrhythmic

Mechanism of Action:
- Decreases automaticity by slowing the rate of spontaneous Phase 4 depolarization.

Indications:
- Suppression of ventricular dysrhythmias (V-tach, VF, PVCs)
- Prophylaxis against recurrence after conversion from V-tach/VF
- Head injuries in preparation for sedation assisted intubation.

Contraindications:
- Second degree and third degree blocks in absence of artificial pacemaker.
- Hypotension
- Stokes-Adams syndrome (slow or absent pulse vertigo, syncope, seizure due to AV block or sick sinus syndrome)

Adverse Reactions:
- Slurred speech
- Seizures
- Altered mental status, confusion
- Lightheadedness
- Blurred vision
- Bradycardia

Drug Interactions:
- Apnea induced with succinylcholine may be prolonged with high doses of Lidocaine.
- Cardiac depression may occur in conjunction with IV Dilantin.
- Procainamide may exacerbate the CNS effects. Metabolic clearance decreased in patients with liver disease or those patients taking beta-blockers

How Supplied:
- 100 mg in 5 ml solution prefilled syringes
- 1 and 2 gram additive syringes
- 100 mg in 5 ml solution ampules
- 1 and 2 gram vials in 30 ml of solution

Dosage and Administration:

Adult:
- **Cardiac arrest VT/VF:** 1.5 mg/kg IV push. Repeated 3-5 minutes to a maximum dose of 3 mg/kg. After conversion begin drip at 2-4 mg/min.
- **VT with pulse:** 1-1.5 mg/kg IV push, then 0.5-0.75 mg/kg repeated 5-20 min. to a maximum of 3 mg/kg. Begin a drip at 2-4 mg/min.
- **PVCs with pulse:** 0.5-1.5 mg/kg IV push, additional boluses of 0.5-1.5 mg/kg repeated 5-10 min. to a maximum of 3 mg/kg. Begin a drip at 2-4 mg/min.
- **VF prophylaxis:** 0.5 mg/kg IV push. Additional boluses 0.5 mg/kg in 8-10 minutes up to 2 mg/kg. Begin a drip at 2-4 mg/min.
- **Head Injury:** 1.5 mg/kg IV push.

Pediatric:
- **PVC’s, VF or pulseless VT:** 1 mg/kg IV, IO. Infusion: 20-50 mcg/kg/min.
Duration of Action:
- Onset: 1-5 minutes
- Peak effect: 5-10 minutes
- Duration: Variable (15 minutes – 2 hours)

Special Considerations:
- Pregnancy
- Reduce maintenance infusions by 50% if patient is over 70 years of age, has liver disease, or is in CHF or shock
- A 75-100 mg bolus maintains levels for only 20 minutes
- If bradycardia occurs with PVCs, always treat the bradycardia with Atropine
- High doses of Lidocaine can result in coma or death
- Avoid Lidocaine for reperfusion dysrhythmias after thrombolytic therapy
- Cross-reactivity with other forms of local anesthetics
LORAZEPAM (ATIVAN)

Class:
- Benzodiazepine; sedative, anticonvulsant

Mechanism of Action:
- Anxiolytic, anticonvulsant and sedative effects; suppresses propagation of seizure activity produced by foci in cortex, thalamus and limbic areas.

Indications:
- Initial control of status epilepticus or severe recurrent seizures
- Severe anxiety
- Sedation

Contraindications:
- Acute narrow-angle glaucoma
- Coma, shock or suspected drug abuse

Adverse Reactions:
- Respiratory depression, apnea
- Drowsiness, sedation
- Ataxia
- Psychomotor impairment
- Confusion, delirium
- Restlessness
- Hypotension
- Bradycardia

Drug Interactions:
- May precipitate CNS depression if patient is already taking CNS depressant medications.

How Supplied:
- 2 and 4 mg/ml concentrations in 1 ml vials

Dosage and Administration:

Adult: 1 mg slow IV or IM. May repeat in 15-20 minutes to maximum dose of 8 mg.
For sedation: 0.05 mg/kg up to 4 mg IM.

Pediatric: 0.05-0.10 mg/kg slow IV or IO slowly over 2 minutes or IM. May repeat in 15-20 minutes to a maximum dose of 0.2 mg/kg XXXXXXXXXXX?

Duration of Action:
- Onset: 1-5 minutes
- Peak effect: Variable
- Duration: 6-8 hours

NOTE
When given IV or IO it must be diluted with an equal volume of sterile water or sterile saline. When given IM, Lorazepam is not to be diluted.
Special Considerations:

- Pregnancy
- Monitor BP and respiratory rate during administration
- Have advanced airway equipment readily available
- Inadvertent arterial injection may result in vasospasm and gangrene
- Lorazepam expires in 6 weeks if not refrigerated
**MAGNESIUM SULFATE**

**Class:**
- Electrolyte

**Mechanism of Action:**
- Reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetyl cholinesterase release at the myoneural junction. Manages seizures in toxemia of pregnancy, induces uterine relaxation. Can cause bronchodilation after beta-antagonists and anticholinergics have been used.

**Indications:**
- Seizures of eclampsia (toxemia of pregnancy)
- Torsades de Pointes
- Hypomagnesaemia
- TCA overdose-induced dysrhythmias
- Digitalis-induced dysrhythmias
- Class IIb agent for refractory VF and VT after administration of Lidocaine or Bretylium

**Contraindications:**
- Heart blocks
- Renal failure
- Patients taking calcium channel blockers

**Adverse Reactions:**
- Respiratory and CNS depression
- Hypotension
- Cardiac arrest and asystole may occur
- Facial flushing, diaphoresis, depressed reflexes
- Circulatory collapse

**Drug Interactions:**
- May enhance effects of other CNS depressants
- Serious changes in overall cardiac function may occur with cardiac glycosides

**How Supplied:**
- 2 ml and 20 ml vials of a 50% solution

**Dosage and Administration:**
**Adult:**
- **Seizures of eclampsia:** 1-4 gm IV push over 3 minutes.
- **Torsades de Pointes:** 1 gm IV push over 5-6 minutes

**Pediatric:** Not recommended

**Duration of Action:**
- Onset: Immediate
- Peak effect: Variable
- Duration: 3-4 hours

**Special Considerations:**
- Pregnancy: Not recommended to be given in the 2 hours before delivery, if possible.
- IV calcium gluconate or calcium chloride should be available as antagonist if needed.
- The “cure” for toxemia is delivery of the baby.
- Use with caution in patients with renal failure.
- Magnesium Sulfate is being used for acute MI patients in some systems under Medical Direction.
METHYL PREDNISOLONE (SOLU-MEDROL)

Class:
- Anti-inflammatory glucocorticoid

Mechanism of Action:
- Synthetic steroid that suppresses acute and chronic inflammation. Potentiates vascular smooth muscle relaxation by beta-adrenergic agonists.

Indications:
- Acute spinal cord injury
- Anaphylaxis
- Refractory asthma

Precautions
- Premature infants
- Use with caution in patients with GI bleeding

Adverse Reactions:
- Headache
- Hypertension
- Sodium and water retention
- CHF
- Hypokalemia
- Alkalosis
- Peptic ulcer disease
- Nausea, vomiting
- Hyperglycemia in diabetes

Drug Interactions:
- Hypoglycemic responses to insulin and hypoglycemic agents may be blunted.
- Potassium-depleting agents may exacerbate hypokalemic effects

How Supplied:
- 40, 125, 500 and 1000 mg vials

Dosage and Administration:
Adult:
- Acute spinal cord injury: 30 mg/kg IV over 30 minutes followed by an infusion of 5.4 mg/kg/hr
- Asthma, COPD: 1-2 mg/kg IV, usually a single 125 mg dose.

Pediatric:
- Acute spinal cord injury: 30 mg/kg IV over 30 minutes followed by an infusion of 5.4 mg/kg/hr.
- Asthma: 1-2 mg/kg IV

Duration of Action:
- Onset: 1-2 hours
- Peak effect: Variable
- Duration: 8-24 hours

Special Considerations:
- Pregnancy
- Not effective if spinal cord injury greater than 8 hours
- Crosses the placenta and may cause fetal harm
MIDAZOLAM (VERSED)

Class:
- Short-acting benzodiazepine CNS depressant

Mechanism of Action:
- Anxiolytic and sedative properties similar to other benzodiazepines.

Indications:
- Sedation, anxiolytic prior to endotracheal or nasotracheal intubation
- Administer for conscious sedation

Contraindications:
- Glaucoma
- Shock, coma
- Alcohol intoxication, overdose patient
- Depressed vital signs
- Concomitant use with other CNS depressants, barbiturates, alcohol or narcotics

Adverse Reactions:
- Hiccough, cough
- Over sedation
- Nausea, vomiting
- Injection site pain
- Headache, blurred vision
- Hypotension
- Respiratory depression and arrest

Drug Interactions:
- Should not be used in patients who have taken CNS depressants

How Supplied:
- 2, 5, 10 ml vials (1 mg/ml)
- 1, 2, 5, 10 ml vials (5 mg/ml)

Dosage and Administration:
**Adult:** 0.1 mg/kg IV push may be repeated in 2-3 minutes up to a maximum of 0.3 mg/kg.

**Pediatric:** 0.1 mg/kg IV push may be repeated in 2-3 minutes up to a maximum of 0.3 mg/kg.

Duration of Action:
- Onset: 1-3 minutes IV and dose dependent
- Peak effect: Variable
- Duration: 2-6 hours and dose dependent

Special Considerations:
- Pregnancy
- Administer immediately prior to intubation procedure
- Requires continuous monitoring of respiratory and cardiac function
MORPHINE SULFATE

Class:
- Opioid analgesic (schedule II drug)

Mechanism of Action:
- Alleviates pain through CNS actions
- Suppresses fear and anxiety centers in the brain
-Depresses brain stem respiratory centers
- Increases peripheral venous capacitance and decreases venous return
- Decreases preload and afterload, decreasing myocardial oxygen demand

Indications:
- Analgesic for moderate to severe acute and chronic pain (use with caution)
- Severe CHF, pulmonary edema
- Chest pain associated with acute MI

Contraindications:
- Head injury
- Exacerbated COPD, depressed respiratory drive
- Hypotension
- Undiagnosed abdominal pain
- Decreased level of consciousness
- Suspected Hypovolemia
- Patients who have taken MAOIs within the past 14 days

Adverse Reactions:
- Respirator depression, bronchospasm
- Hypotension, bradycardia, tachycardia
- Decreases level of consciousness, euphoria, syncope
- Nausea, vomiting, facial flushing, dry mouth

Drug Interactions:
- Potentiates sedative effects of phenothiazines
- CNS depressant may potentiate effects of Morphine
- MAOIs may cause paradoxical excitation

How Supplied:
- 10 mg in 1 ml of solution, ampules and Tubex syringes

Dosage and Administration:
Adult: 1-5 mg IV, IM, SC every 5 minutes titrated to a maximum of 10 mg

Pediatric: 0.1-0.2 mg/kg IV, IO, IM, SC every 5 minutes titrated to a maximum of 5 mg

Duration of Action:
- Onset: Immediate
- Peak effect: 20 minutes
- Duration: 2-7 hours

Special Considerations:
- Pregnancy
- Morphine rapidly crosses the placenta
- Safety in neonate not established
- Use with caution in geriatric patients and those with COPD, Asthma
- Vagotonic effect in patients with acute inferior MI (bradycardia, heart block)
- Naloxone should be readily available as antidote
NALOXONE (NARCAN)

Class:
- Narcotic antagonist

Mechanism of Action:
- Competitive inhibition of narcotic receptor sites
- Reverses respiratory depression secondary to narcotic (opioid) drugs
- No effect on barbiturates, etc.
- Completely inhibits the effect of Morphine

Indications:
- Opiate overdose, coma
- Complete or partial reversal of CNS and respiratory depression induced by opioids
  - Morphine, heroin, hydromorphone (Dilaudid), methadone, Meperidine (Demerol), Paregoric, Fentanyl (Sublimase), Oxycodone (Percodan), codeine, propoxyphene (Darvon)
- Narcotic agonist and antagonist
  - Butorphanol (Stadol), Pentazocine (Talwin), Nalbuphine (Nubain)
- Decreased level of consciousness
- Coma of unknown origin

Contraindications:
- Use with caution in narcotic-dependent patients
- Use with caution in neonates of narcotic-addicted mothers

Adverse Reactions:
- Withdrawal symptoms in the addicted patient
- Tachycardia, dysrhythmias
- Hypertension
- Nausea, vomiting, diaphoresis

Drug Interactions:
- Incompatible with bisulfate and alkaline solutions

How Supplied:
- 0.02 mg/ml (neonate), 0.4 mg/ml, 1 mg/ml, 2 mg/2 ml ampules, 2 mg/5 ml prefilled syringes

Dosage and Administration:
**Adult:** 0.4 – 2 mg IV, IM, SC, or ET (diluted). Minimum recommended: 2 mg, repeat at 5 minute intervals to 10 mg maximum dose. Medical Control may request higher amounts. Infusion: 2 mg in 500 ml of D5W (4 mcg/ml), infuse at 0.4 mg/hr (100 ml/hr).

**Pediatric:** 0.1 mg/kg IV, IM, SC, ET (diluted) to a maximum dose of 2.0 mg. If no response in 10 minutes, administer an additional 0.1 mg/kg

Duration of Action:
- Onset: Within 2 minutes
- Peak effect: Variable
- Duration: 30-60 minutes

Special Considerations:
- Pregnancy
- Seizures without causal relationship have been reported
- May not reverse hypertension
- Shorter acting than narcotics therefore, may have to be repeated
NATRECOR (NESIRITIDE)

Class
- Adrenergic
- Cardiovascular

Mechanism of action:
- Primarily effects heart and arterial systems
- Effects are dependent upon the dose administered

Indications:
- Acutely decompensated congestive heart failure

Contraindications:
- Cardiogenic shock
- Hypotension - systolic blood pressure less than 90 mmHg
- Hypersensitivity

Adverse reactions:
- Hypotension
- Confusion
- Nausea

How supplied:
- 1.5 mg/vial lyophilized powder. Requires reconstitution.

Dosage and administration:
Adult: 2 mcg/kg IV bolus followed by 0.01 mcg/kg/min continuous IV infusion.
  Maximum dose: 0.03 mcg/kg/min.

Pediatric: Not recommended

Duration of onset:
- Onset: Variable
- Peak effect: Variable
- Duration: Variable
NIMBEX

Class:
- Musculoskeletal agent
- Non-depolarizing neuromuscular blocker

Mechanism of Action:
- An intermediate-onset/intermediate-duration neuromuscular blocking agent.

Indications:
- Adjunct to general anesthesia
- Facilitate tracheal intubation
- Provide skeletal muscle relaxation during surgery or mechanical ventilation

Contraindications:
- Hypersensitivity

Precautions:
- Hyperthermia
- Chronic exposure to neuromuscular blockers
- Sepsis
- Major burns

Adverse Reactions:
- Bradyarrhythmia
- Hypotension
- Bronchospasm

Drug Reactions:
- May potentiate effects of furosemide, phenytoin, theophylline, carbamazepine aminoglycosides, corticosteroids, calcium-channel blockers, procainamide, vancomycin

How Supplied:
- Intravenous solution: 2 mg/ml or 10 mg/ml

Dosage and Administration:
Adult: 0.15 – 0.20 mg/kg IV bolus followed by a maintenance infusion of 1-3 mcg/kg/min

Pediatric: 0.1 mg/kg IV followed by a maintenance infusion of 1-3 mcg/kg/min.

Duration of Action:
- Onset: Immediate
- Peak: 1-3 minutes
- Duration: Variable
NITROGLYCERINE (NITROSTAT, TRIDAL, AND OTHERS)

Class:
- Vasodilator

Mechanism of Action:
- Smooth muscle relaxant acting on vascular, bronchial, uterine, and intestinal smooth muscle
- Dilation of arterioles and veins in the periphery, reduces preload and afterload, decreases the work load of the heart and, thereby, myocardial oxygen demand.

Indications:
- Acute angina pectoris
- Ischemic chest pain
- Hypertension
- CHF, pulmonary edema

Contraindications:
- Hypotension
- Hypovolemia
- Intracranial bleeding or head injury

Adverse Reactions:
- Headache
- Hypotension
- Syncope
- Reflex tachycardia
- Flushing, diaphoresis
- Nausea, vomiting
- Muscle twitching

Drug Interactions:
- Additive effects with other vasodilators
- Incompatible with other drugs IV

How Supplied:
- NTG spray: 0.4mg per spray
- NTG IV (Tridil)
- Tablets: 0.15 mg (1/400 grain), 0.3 mg (1/200 grain), 0.4 mg (1/150 grain), 0.6 mg (1/100 grain)

Dosage and Administration:
Adult: NTG Spray: 0.4 - 0.8 mg under the tongue
Tablets: 0.4-0.8 mg SL, may repeat in 3-5 minutes to a maximum of 3 doses
NTG IV infusion: 5 mcg/min. Increase by 5-10 mcg/min. every 5 minutes until desired effect

Pediatric: Not recommended

Duration of Action:
- Onset: 1-3 minutes
- Peak effect: 5-10 minutes
- Duration: 20-30 minutes, or if IV, 1-10 minutes after discontinuation of infusion

Special Considerations:
- Pregnancy
- Hypotension more common in geriatric population
- NTG decomposes if exposed to light or heat
- Must be kept in airtight containers
- Active ingredient may have a stinging effect when administered SL
NITROPASTE (NITRO-BID OINTMENT)

Class:
- Vasodilator

Mechanism of Action:
- Same as NTG

Indications:
- Angina pectoris and chest pain associated with acute MI. CHF/Pulmonary edema while on CPAP.

Contraindications:
- Same as NTG

Adverse Reactions:
- Same as NTG

How Supplied:
- 2% solution of tubes in absorbent paste
- 20, 60 gram tubes of paste with measuring applicators
- Transdermal units of varying doses

Dosage and Administration:
Adult: PASTE: apply ½ to 1 inch (1-2.5 cm), 15-30 mg, and cover with wrap and secure with tape. Maximum dose of 5 inches (75 mg) per application
TRANSDERMAL: apply unit to intact skin (usually chest wall) in varying doses

Pediatric: Not recommended

Duration of Action:
- Onset: 30 minutes
- Peak effect: Variable
- Duration: 18-24 hours

Special Considerations:
- Pregnancy
- Not of great value in pre-hospital arena
- Avoid using fingers to spread paste
- Store paste in a cool place with the tube tightly capped
- Erratic absorption rates quite common
OCTREOTIDE (SANDOSTATIN)

Class:
- Endocrine/metabolic

Mechanism of action:
- Sandostatin has similar effects to a natural hormone called somatostatin and is given by injection. Sandostatin suppresses growth hormone. It is used to treat flushing and diarrhea associated with certain tumors.

Indications:
- Acromegaly
- Diarrhea and flushing associated with carcinoid tumors
- Diarrhea associated vasoactive intestinal peptide tumors

Contraindications:
- Sensitivity to octreotide

Adverse reactions:
- Abdominal pain, constipation, diarrhea
- Nausea
- Dizziness, headache
- Hyper/hypoglycemia
- Pancreatitis

How supplied:
- 50 mcg/ml, 100 mcg/ml, 200 mcg/ml, 500 mcg/ml, 1000 mcg/ml injection
- 10 mg, 20 mg, 30 mg lyophilized powder

Dosage and administration:
Adult: 20-50 mcg subcutaneously. May be given IV push or diluted in D5W and infused over 15-30 min

Pediatrics: Not recommended

Duration of onset:
- Variable
ONDANSETRON (ZOFRAN®)

Class:
- Antiemetic

Mechanism of action:
- Selectively antagonizes serotonin 5-HT3 receptors

Indications:
- Nausea; vomiting after administration of Morphine Sulfate
- Nausea; vomiting
- Nausea upon consideration of CPAP

Contraindications:
- Hypersensitivity to Ondansetron
- Known allergies to 5-HT3 receptors (ie: Kytril, Aloxi)
- Age less than 8 years old

Adverse reactions:
- Headache (40% incidence)
- QTc prolongation
- Tachycardia; anginal chest pain (rare)
- Constipation; diarrhea; dry mouth
- Dizziness (5% incidence)
- Transient blindness (rare)

How supplied:
- 4 mg/2 ml vial

Dosage and administration:
Adult: 4 mg IM; or slow IV push (May not be repeated)

Pediatrics: Over age 8: 0.1 mg/kg (maximum single dose of 4 mg) IM or slow IV over 2-5 minutes

Duration of onset:
- IM: 30 minutes
- IV: minutes
OXYGEN

Class:
- Naturally occurring atmospheric gas

Mechanism of Action:
- Reverses hypoxemia

Indications:
- Confirmed or suspected hypoxemia
- Ischemic chest pain
- Respiratory insufficiency
- Prophylactically during air transport
- Confirmed or suspected carbon monoxide poisoning
- All other causes of decreased tissue oxygenation
- Decreased level of consciousness

Contraindications:
- Certain patients with COPD, emphysema who will not tolerate oxygen concentrations over 35%
- Hyperventilation

Adverse Reactions:
- Decreased level of consciousness and respiratory depression in patients with chronic CO2 retention
- Retrolental fibroplasia if given in high concentrations to premature infants (maintain 30-40% O2)

Drug Interactions:
- None

How Supplied:
- Oxygen cylinders (usually green and white) of 100% compressed oxygen gas

Dosage and Administration:
- Adult: Cardiac arrest and carbon monoxide poisoning: 100%
- **Hypoxemia**: 10-15 LPM via non-rebreather
- **COPD**: 0-2 LPM via nasal cannula or 28-35% venturi mask. Be prepared to provide ventilatory support if higher concentrations of oxygen are needed.
- **Pediatric**: Same as adult with the exception of premature infants

Duration of Action:
- Onset: Immediate
- Peak effect: not applicable
- Duration: less than 2 minutes

Special Considerations:
- Be familiar with liter flow and each type of delivery device used
- Supports possibility of combustion
PANCURONIUM (PAVULON)

Class:
- Nondepolarizing neuromuscular blocker/paralytic

Mechanism of Action:
- Binds to the receptor for acetylcholine at the neuromuscular junction

Indications:
- Induction or maintenance of paralysis after intubation to assist ventilations

Contraindications:
- Hypersensitivity
- Inability to control airway and support ventilations with oxygen and positive pressure
- Neuromuscular disease (myasthenia gravis)
- Hepatic or renal failure

Adverse Reactions:
- Apnea
- Tachycardia, PVCs
- Transient hypotension
- Increased blood pressure
- Pain, burning at injection site
- Weakness, salivation

Drug Interactions:
- Positive chronotropic drugs may potentiate tachycardia

How Supplied:
- 4 mg/2 ml ampule

Dosage and Administration:
Adult: 0.1 mg/kg slow IV, repeat every 30-60 minutes PRN
Pediatric: 0.1 mg/kg slow IV, IO

Duration of Action:
- Onset: 30 seconds
- Peak effect: Paralysis in 3-5 minutes
- Duration: 45-60 minutes

Special Considerations:
- Pregnancy
- If patient is conscious, explain the effect of the medication before administration and always sedate before use
- Intubation and ventilatory support must be readily available
- Monitor the patient carefully
- Effects may be reversed with neostigmine (Prostigmin) 0.05 mg/kg and should be accompanied by atropine 0.5-1.2 mg IV
- Pancuronium has no effect on consciousness or pain
- Will not stop neuronal seizure activity
- Heart rate and cardiac output are increased
- Decreased doses for patients with renal disease
PHENYLEPHRINE (NEOSYNEPHRINE)

Class
- Adrenergic

Mechanism of action:
- Primarily effects heart and arterial systems
- Effects are dependent upon the dose administered
- Vasoconstrictor

Indications:
- Anesthesia
- Hypotension
- Paroxysmal supraventricular tachycardia

Contraindications:
- Hypersensitivity
- Severe hypertension
- Tachycardia

Adverse reactions:
- Hypertension
- Myocardial Infarction
- Pulmonary edema
- Tachycardia
- Ventricular arrhythmias

How supplied:
- 10 mg/ml solution for injection

Dosage and administration:
- **Adult hypotension**: Initial IV rate 100-180 mcg/min until BP stabilized; then may reduce IV rate to 40-60 mcg/min.
- **Adult PSVT**: Initial up to 500 mcg IV given rapidly within 20-30 seconds; incremental increases of additional; doses should not exceed 100-200 mcg and should be based on blood pressure.
- **Pediatric hypotension**: 5-20 mcg/kg IV bolus dose; repeat every 10-15 minutes.

Duration of onset:
- Onset: Variable
- Peak effect: Variable
- Duration: Variable
PHENYTOIN (DILANTIN)

Class:
- Anticonvulsant

Mechanism of Action:
- Promotes sodium efflux from neurons, thereby stabilizing the neuron’s threshold against excitability caused by excess stimulation. In similar fashion, decreases abnormal ventricular automaticity and decreases the refractory period in the myocardial conduction system.

Indications:
- Prophylaxis and treatment of major motor seizures
- Digitalis – induced dysrhythmias

Contraindications:
- Hypersensitivity
- Bradycardia
- Second and third degree heart block

Adverse Reactions:
- Hypotension with too rapid IV push
- Heart block, dysrhythmias, cardiovascular collapse
- Nausea, vomiting
- Ataxia, nystagmus
- CNS depression, respiratory depression
- Pain at the injection site

Drug Interactions:
- Serum Dilantin levels increased by: anticoagulants, Tagamet, Zantac, Pepcid, Axicl, sulfonamides, salicylates
- Metabolism increased by chronic alcohol use
- Cardiac depressant effects by lidocaine, propanolol, and other beta blockers

How Supplied:
- 50 mg/ml in 2 and 5 ml ampules, 2 ml prefilled syringes. May be diluted in NaCl (1-10 mg/ml): use in-line filter.

**NOTE**

IV line should be flushed with 0.9% NaCl before and after drug administration.

Dosage and Administration:
- **Adult Seizures:** 10-20 mg/kg slow IV, not to exceed 1 gram or rate of 50 mg/min
- **Adult Dysrhythmias:** 50-100 mg (diluted) slow IV every 5-15 minutes PRN to a maximum of 1 gram
- **Pediatric Seizures:** 10-20 mg/kg slow IV (1-3 mg/kg/min)
- **Pediatric Dysrhythmias:** 5 mg/kg slow IV to a maximum of 1 gram

Duration of Action:
- Onset: 20-30 minutes for seizure disorder
- Peak effect: 1-3 hours
- Duration: 18-24 hours but as long as 15 days reported

Special Considerations:
- Pregnancy
- Carefully monitor VS
- Venous irritation may occur (use large stable vein)
PROCAINAMIDE (PRONESTYL)

Class:
- Antidysrhythmic Class IIb

Mechanism of Action:
- Suppresses phase IV depolarization in normal ventricular muscle and Purkinje fibers, reducing automaticity of ectopic pacemakers. Suppresses reentry dysrhythmias by slowing intraventricular conduction

Indications:
- Suppress PVCs refractory to Lidocaine
- Suppress VT with a pulse refractory to Lidocaine
- Suppress VF refractory to Lidocaine
- PSVTs with wide-complex tachycardia of unknown origin (drug of choice when associated with WPW)

Contraindications:
- Second or third degree block
- Torsades de Pointe
- Lupus
- Digitalis toxicity
- Myasthenia gravis

Adverse Reactions:
- PR, QRS, and QT widening, AV block, reflex tachycardia, cardiac arrest
- PVCs, VT, VF
- Hypotension
- Seizures
- Nausea, vomiting
- CNS depression
- Confusion

Drug Interactions:
- None with other emergency drugs

How Supplied:
- 1 gram in 10 ml (100 mg/ml)
- 1 gram in 2 ml vials (500 mg/ml) for infusion

Dosage and Administration:
- Adult: 20-30 mg/min. to a maximum of 17 mg/kg. Maintenance infusion: 1-4 mg/min.
- Pediatric: 2-6 mg/kg IV, IO at less than 20 mg/min. maximum dose is 17 mg/kg. Maintenance infusion: 20-80 micrograms/kg/min.

Duration of Action:
- Onset: 10-30 minutes
- Peak effect: Variable
- Duration: 3-6 hours

Special Considerations:
- Discontinue infusion if hypotension develops, the QRS complex widens by 50% of its original width or a total of 17 mg/kg has been administered or if the dysrhythmia is suppressed.
- Pregnancy
- Potent vasodilating and inotropic effects
- Hypotension with too rapid an infusion
- Carefully monitor vital signs and EKG
Administer cautiously to patients with renal, hepatic or cardiac insufficiency, asthma or digitalis induced dysrhythmias
ROCURONIUM

Class:
- Musculoskeletal agent
- Non-depolarizing neuromuscular blocker

Mechanism of Action:
- Steroidal non-depolarizing neuromuscular blocking agent.
- Binds to pre- and post-synaptic nicotinic receptor of the neuromuscular junction.

Contraindications:
- Hypersensitivity

Adverse Reactions:
- Cardiac dysrhythmia
- Hypertension
- Hypotension
- Tachydysrhythmia

Drug Interactions:
- None with other emergency drugs

How Supplied:
- Intravenous solution: 10 mg/ml

Dosage and Administration:
- Adult Induction: Initial, 0.6 mg/kg IV
- Adult Induction: Maintenance, 0.1-0.2 mg/kg IV repeated as needed
- Adult Induction: Maintenance, 0.01-0.012 mg/kg/min continuous IV infusion
- Adult Intubation: (RSI) Initial, 0.6-1.2 mg/kg IV
- Adult Intubation: Maintenance, 0.1-0.2 mg/kg IV repeated as needed
- Adult Intubation: Maintenance, 0.01-0.012 mg/kg/min continuous IV infusion.

- Pediatric Induction: (3 months-12 years) Initial, 0.6 mg/kg IV
- Pediatric Induction: (3 months-12 years) Maintenance, 0.075-0.125 mg/kg IV repeated as needed
- Pediatric Induction: (3 months-12 years) Maintenance, 0.012 mg/kg/min continuous IV infusion
- Pediatric Intubation: (3 months-12 years) Initial, 0.6 mg/kg IV
- Pediatric Intubation: (3 months-12 years) Maintenance, 0.075-0.125 mg/kg IV repeated as needed
- Pediatric Intubation: (3 months-12 years) Maintenance, 0.012 mg/kg/min continuous IV infusion.

Duration of Action:
- Onset: 60-90 seconds
- Duration: 20-90 minutes

Special Considerations:
- Administration must be accompanied by adequate anesthesia or sedation.
- Do not mix with alkaline solutions in the same syringe or administer simultaneously during intravenous infusion through the same needle.
**SODIUM BICARBONATE 8.4%**

**Class:**
- Buffer, alkalinizer

**Mechanism of Action:**
- Reacts with hydrogen ions to form water and carbon dioxide therefore acting as a buffer for metabolic acidosis

**Indications:**
- Known pre-existing bicarbonate-responsive acidosis
- Prolonged resuscitation with effective ventilation
- Upon return of spontaneous circulation after long arrest interval
- TCA overdose
- Phenobarbital overdose
- Alkalinization for treatment of specific intoxications

**Contraindications:**
- Metabolic and respiratory alkalosis
- Hypocalcemia and hypokalemia
- Hypocloremia secondary to GI loss and vomiting

**Adverse Reactions:**
- Metabolic alkalosis, hypokalemia
- Hyperosmolarity, fluid overload
- Increase in tissue acidosis
- Electrolyte imbalance and tetany, seizures
- Tissue sloughing at injection site

**Drug Interactions:**
- May precipitate in calcium solutions
- Half-lives of certain drugs may increase through alkalization of the urine
- Vasopressors may be deactivated

**How Supplied:**
- 50 mEq in 50 ml of solvent

**Dosage and Administration:**
- **Adult:** 1 mEq/kg IV, repeat with 0.5 mEq/kg every 10 minutes
- **Pediatric:** same as adult

**Duration of Action:**
- Onset: 2-10 minutes
- Peak effect: 15-20 minutes
- Duration: 30-60 minutes

**Special Considerations:**
- Pregnancy
- Must ventilate patient after administration
- Whenever possible, blood gas analysis should guide the use of bicarbonate
- Intracellular acidosis may be worsened by production of carbon dioxide
- May increase edematous states
- May worsen CHF
- Must clear IV line pre and post infusion if used with vasopressors
SUCCINYLCHOLINE (ANECTINE)

Class:
- Depolarizing neuromuscular blocker, paralyzing agent

Mechanism of Action:
- Bind to the receptors for acetylcholine

Indications:
- To facilitate intubation
- To terminate laryngospasm
- To promote muscle relaxation
- To facilitate electroconvulsive shock therapy

Contraindications:
- Acute narrow angle glaucoma
- Penetrating eye injuries
- Inability to control airway or support ventilations with oxygen and positive pressure

Adverse Reactions:
- Apnea, cardiac arrest
- Dysrhythmias, bradycardia
- Hypertension, hypotension
- Malignant hyperthermia
- Hyperkalemia, exacerbation of hyperkalemia in trauma patients

Drug Interactions:
- Effects potentiated by oxytocin, beta-blockers and organophosphates
- Diazepam may reduce duration of action

How Supplied:
- 40 mg in 2 ml ampule (20 mg/ml)
- 100 mg in 5 ml ampule (20 mg/ml)
- Multi-dose vial

Dosage and Administration:
- Adult: 1-2 mg/kg rapid IV, repeat once if needed
- Pediatric: 2 mg/kg (in infants and small children) rapid IV, IO. Repeat once if needed

Duration of Action:
- Onset: 1 minute
- Peak effect: 1-3 minutes
- Duration: 5 minutes

Special Considerations:
- Pregnancy
- EMS use primarily to facilitate endotracheal intubation
- If the patient is conscious, explain the effects of the drug before administration
- Consider premedication with atropine, particularly in the pediatric age group
- Premedication with Lidocaine may blunt any increase in intracranial pressure during intubation
- Diazepam or midazolam must be used in any conscious patient undergoing neuromuscular blockade
THIAMINE

Class:
- Vitamin (B1)

Mechanism of Action:
- Combines with ATP to form thiamine pyrophosphate coenzyme, a necessary component for carbohydrate metabolism. The brain is extremely sensitive to thiamine deficiency.

Indications:
- Coma of unknown origin
- Delirium tremens
- Beriberi
- Wernicke’s encephalopathy

Contraindications:
- None

Adverse Reactions:
- Hypotension from too rapid injection or too high a dose
- Anxiety
- Diaphoresis, nausea, vomiting
- Rare allergic reaction

Drug Interactions:
- Give thiamine before glucose in the alcoholic or poorly nourished patient

How Supplied:
- 1,000 mg in 10 ml vial (100 mg/ml)

Dosage and Administration:
- Adult: 100 mg slow IV or IM
- Pediatric: 10-25 mg slow IV or IM

Duration of Action:
- Onset: Rapid
- Peak effect: Variable
- Duration: Dependent upon degree of deficiency

Special Considerations:
- Pregnancy
- Large IV doses may cause respiratory difficulties
- Anaphylactic reactions reported
VECURONIUM (NORCURON)

Class:
- Paralytic agent

Mechanism of Action:
- Non-depolarizing neuromuscular blocking agent, paralytic

Indications:
- To facilitate intubation
- To terminate laryngospasm
- To promote muscle relaxation
- To facilitate electroconvulsive shock therapy

Contraindications:
- Acute narrow angle glaucoma
- Penetrating eye injuries
- Inability to control airway or support ventilations with oxygen and positive pressure
- Newborns
- Myasthenia gravis
- Hepatic or renal failure

Adverse Reactions:
- Apnea
- Weakness, salivation
- PVCs, tachycardia
- Transient hypotension, increased blood pressure

Drug Interactions:
- Use of inhalational anesthetics will enhance neuromuscular blockade

How Supplied:
- 10 mg/10 ml vecuronium bromide vials with dilutent
- 20 mg/20 ml veruconium without dilutent

Dosage and Administration:
- **Adult:** 0.1 mg/kg IV push. Maintenance dose within 25-40 minutes: 0.01-0.05 mg/kg IV push
- **Pediatric:** 0.1 mg/kg IV, IO. Maintenance dose within 20-35 minutes: 0.01-0.05 mg/kg IV push.

Duration of Action:
- Onset: 30 seconds
- Peak effect: 2.5-3 minutes
- Duration: 25-30 minutes

Special Considerations:
- Pregnancy
- If patient is conscious, explain the effect of the medication before administration and always sedate the patient before using vecuronium
- Intubation and ventilatory support must be readily available. Monitor the patient carefully
- Vecuronium has no effect on consciousness or pain
- Will not stop neuronal seizure activity
- Heart rate and cardiac output are increased
- Decrease doses for patients with renal disease
**VASOPRESSIN**

**Class:**
- Non-adrenergic peripheral vasoconstrictor

**Mechanism of action:**
- Directly stimulates smooth muscle receptors.

**Indications:**
- Ventricular fibrillation
- Septic shock
- Diabetes insipidus
- Hemorrhage

**Contraindications:**
- Anaphylaxis or hypersensitivity to the drug

**Adverse reactions:**
- Anaphylaxis
- Arrhythmias
- Cardiac arrest
- Decreased cardiac output
- Myocardial infarction
- Bronchial constriction

**How supplied:**
- 20 pressor units/ml solution for injection.

**Dosage and administration:**
- **Adult Hemorrhage:** Intravenous infusion at 0.2 units/minute until the hemorrhage is controlled.
- **Adult Vfib:** 40 units intravenously as a single, one-time dose.
- **Pediatric:** Continuous intravenous infusion at 1 to 3 milliunits/kilogram/hour.

**Duration of onset:**
- Onset: Variable
- Peak effect: Variable
- Duration: Variable
VERAPAMIL (ISOPTIN)

Class:
- Anti-dysrhythmic

Mechanism of Action:
- Calcium channel blocker, antidysrhythmic
- Prolongs AV nodal refractory period
- Dilates coronary arteries and arterioles

Indications:
- PSVT, PAT
- Atrial fibrillation and atrial flutter with rapid ventricular response

Contraindications:
- Wolff-Parkinson-White syndrome
- Second or third degree heart block
- Sick sinus syndrome (unless the patient had functioning pacemaker)
- Hypotension, cardiogenic shock, severe CHF, pulmonary edema
- Patients receiving beta blockers
- Wide-complex tachycardia
- Children less than 12 months of age

Adverse Reactions:
- Hypotension
- AV block, complete AV block
- Bradycardia, asystole, dizziness, headache, nausea, vomiting
- Peripheral edema

Drug Interactions:
- Increases serum concentration of digoxin
- Beta-adrenergic blockers may have additive negative inotropic and chronotropic effects
- Antihypertensives may potentiate hypotensive effects

How Supplied:
- 5 mg/2 ml in 2, 4, 5 ml vials or 2, 4 ampules

Dosage and Administration:
- Adult: 2.5-5 mg IV bolus over 2 minutes. Repeat doses of 5-10 mg. May be given every 15-30 minutes to a maximum of 20 mg.
- Pediatric: 0.1-0.2 mg/kg/dose IV, IO push over 2 minutes. Repeat dose in 30 minutes if not effective. (NOTE: not to be used in children less than 12 months of age)

Duration of Action:
- Onset: 2-5 minutes
- Peak effect: Variable
- Duration: 30-60 minutes

Special Considerations:
- Pregnancy
- Closely monitor patient’s VS
- Be prepared to resuscitate
- AV block or asystole may occur as a result of slowed AV conduction
INTRAVENOUS THERAPY

THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.

General Vascular Access
1. Paramedics administer intravenous solutions as part of routine paramedic care.
2. Solutions approved for prehospital intravenous infusion include 0.9% normal saline and lactated ringers.
3. 14 to 24 gauge over-the-needle catheters are approved for obtaining peripheral vascular access.

Indications
1. Clinical impression indicating the potential need for medication administration.
2. Clinical impression indicating the need for fluid infusion.

Acceptable Sites
1. Arms and hands
2. External jugular, in extremis
3. Scalp
4. Legs and feet

Catheter size
- 18g or smaller for medication administration
- 18g or larger for volume replacement

IV solution
- NaCl should be used for medication administration or volume replacement
- Lactated ringers should be used for trauma or burns

Rate
- Saline lock for prophylactic IV access
- KVO (30 drops/minute) to administer medication
- For volume replacement titrate the rate to achieve a systolic BP of 90 mmhg or greater

Saline Lock Procedure
1. Inject sterile saline into the injection port of the infusion adapter device, expelling all the air.
2. Position the patient in the best position to access the venipuncture site, if not contraindicated.
3. Apply a tourniquet
4. Cleanse the site thoroughly with Betadine swab and alcohol wipe.
5. Stabilize the vein with thumb and index finger.
6. Choose appropriate size IV catheter based on need for IV access (e.g. medication administration, fluid replacement). Insert the catheter bevel up and at a 15-45 degree angle with the skin.
7. Once flashback is noted, slowly advance the catheter and withdraw the needle.
8. Connect the infusion set and adjust proper flow rate.
9. Dress the site and tape securely.
10. Mark insertion site with time, date and your initials.

NOTES
No more than 3 attempts should be made to establish an IV unless the patient is in extremis or cardiac and or respiratory arrest.
EXTERNAL JUGULAR VEIN CANNULATION

THIS PROCEDURE MAY BE INITIATED ON STANDING ORDER FOR ALL CARDIAC ARRESTS.
ONLINE MEDICAL CONTROL IS REQUIRED FOR ALL OTHER INSTANCES.
WHEN IN DOUBT MEDICAL CONTROL SHOULD BE CONTACTED.

Procedure
1. Select a catheter of appropriate size. The IV catheter should be 16g or larger and at least 2 inches long.
2. Position the patient supine, with head lowered and turned to the opposite side of the venipuncture site if not contraindicated.
3. Expose the neck and determine the site of catheter insertion. The optimal site is a point midway between the angle of the jaw and the middle of the clavicle (mid-clavicular line).
4. Cleanse the site thoroughly with Betadine swab and alcohol wipe.
5. Position your thumb lightly over the vein just below the insertion site and stretch the skin downward so that it is taut, thereby anchoring the vein. The thumb acts like a tourniquet.
6. Insert the catheter bevel up, between the angle of the jaw and the mid-clavicular line. The needle should point to the shoulder on the side of the insertion and at a 15-45 degree angle with the skin.
7. Once flashback is noted, slowly advance the catheter and withdraw the needle. The EJ vein has two sets of paired valves that must be penetrated in order for the IV to be effective. Due to the anatomic relationship of the external jugular vein to the right atrium, pressure, especially in cardiac arrest or hypovolemia may be very low or even negative. Therefore, caution should be used so as not to allow air to be drawn into the open hub of the catheter. Attachment of a syringe partially filled with saline to the catheter hub prior to insertion may help verify entry into the vein.
8. Remove the needle from the catheter, attach the pre-flushed fluid administration set and secure the catheter and set to patient.
10. Mark insertion site with time, date and your initials.

NOTES
• If the EJ IV infiltrated, apply pressure to the site for a minimum of 5 minutes
• Check the site frequently for patency
ADULT/PEDIATRIC INTRAOSSEOUS INFUSION (EZ-IO)

THIS PROCEDURE MAY BE INITIATED ON STANDING ORDER FOR ALL CARDIAC ARRESTS OR IF IV ACCESS IS UNOBTAINABLE BY OTHER MEANS IN A PATIENT IN EXTREMIS.

ON LINE MEDICAL CONTROL IS REQUIRED FOR ALL OTHER INSTANCES.

Intraosseous infusion is an alternative for providing a rapid and effective route for fluid resuscitation and medication administration in life-threatening emergencies when intravenous cannulation is not possible. It has few contraindications or complications and is versatile and reliable. This protocol is written for the use of the “EZ-IO™” intraosseous device.

**Indications:**
- Cardiac or traumatic arrest where IV access is unobtainable by other means
- Fluid or medication cannot be administered by other means
- Patient in extremis where IV access is unobtainable by other means.

**Approved Adult IO Sites:**
1. Proximal tibia
2. Proximal humerous (if tibia unusable)

**Contraindications:**
- Fracture of the tibia or femur (consider alternate tibia)
- Osteoporosis or other bone softening conditions
- Infection or damage at the intended site
- Previous orthopedic procedure or IO within 24 hours (consider alternate tibia)
- Inability to locate landmarks, i.e. significant edema, excessive tissue at insertion site.

**Special Considerations:**
- Flow Rates
  - Due to anatomy of the IO space flow rates may be slower than those achieved with IV catheters
  - Rapidly flush (bolus) 10 ml saline with a syringe through the EZ-IO™
  - Use a pressure bag or pump for continuous infusions
- Pain
  - Insertion of the EZ-IO™ in conscious patients may cause mild to moderate discomfort and is usually no more painful than a large bore IV.
  - Infusion through the EZ-IO™ may cause severe discomfort for conscious patients
    - Prior to IO flush (bolus) on an alert patient, SLOWLY administer 20-50 mg 2% Lidocaine through the EZ-IO™ hub.

**Precautions:**
- The EZ-IO™ is not intended for prophylactic use.

**Equipment:**
- EZ-IO™ driver and needle set
- Alcohol or betadine swabs
- EZ-Connect™
- 10 ml syringe
- Normal saline or lactated ringers IV solution
- Tape or gauze
- Pressure bag
- 2% lidocaine

**Procedure:**
1. Wear approved body substance isolation equipment
2. Determine EZ-Io™ indications
3. Rule out contraindications
4. Locate insertion site
5. Cleanse insertion site using aseptic technique
6. Prepare the EZ-Io™ driver and needle set
7. Stabilize leg and insert EZ-Io™ needle set
8. Remove driver from needle set while stabilizing catheter hub.
9. Remove stylet from needle set, place style in sharps container
10. Confirm placement
11. Connect primed EZ-Connect™
12. Conscious Adult patients should now receive 20-50 mg 2% lidocaine IO. In conscious Pediatric patients use 0.5 mg/kg to a maximum dose of 20 mg.
13. Flush or rapidly bolus the EZ-IO catheter with 10 ml normal saline using a 10 ml syringe
14. Place pressure bag on solution being infused
15. Begin infusion
16. Dress site, secure tubing and apply wristband
17. Frequently monitor IO catheter site and patient condition.

NOTES

Only two attempts shall be made at inserting the EZ-Io™ Alternative access should be obtained in the event of failure on the first attempt.
PEDIATRIC INTRAOSSEOUS INFUSION (IO Needle)

Intraosseous infusion is an alternative for providing a rapid and effective route for fluid resuscitation and medication administration in life-threatening emergencies when intravenous cannulation is not possible. It has few contraindications or complications and is versatile and reliable. Current PALS recommendation is for children age 6 and younger.

**INDICATIONS:**

1. IV access is unobtainable by other means
   - After 1-2 minutes of IV attempts in a critical pediatric patient
   - No obvious peripheral venous access in a critical pediatric patient
   - 3 attempts at IV access have failed in a critical pediatric patient
2. Medication cannot be administered by other means in a critical pediatric patient

**CONTRAINDICATIONS:**

3. Patient > 6 years
4. Injury or recent fracture to the tibia
5. Osteogenesis Imperfecta (congenital disease-fragile bones)
6. Infection of the intended extremity
7. Burns to the intended extremity

**Special Considerations:**

- Do not delay transport of a critical patient to begin intraosseous infusions.
- Maintain ABCs, assisting ventilations as needed with high concentration oxygen. (Assume spinal injury based on mechanism of injury)
- Ascertain appropriate history related to the event, past medical history, medications, drug allergies, and physician.

**Potential Complications**

- Incomplete penetration of bone cortex
- Penetration of the posterior cortex
- Fluid escaping from around the needle
- Fluid leaking from previous cortical punctures

**Equipment**

- Alcohol/Providone-iodine prep
- 10 cc syringe for aspiration
- Intraosseous needle

**Procedure:**

1. Identify the need for intraosseous access
2. Assemble the equipment
3. Select the site
   - For children under the age of six (6) years, the proximal tibia is an appropriate site.
   - When using the anterior medial surface of the proximal tibia, the tibial tuberosity is palpated with the index finger and the medial aspect of the tibia is grasped with the thumb. Halfway between these two points, or approximately 1-2 cm distal to the tibial tuberosity is the optimal point for needle insertion.
   - If the distal tibia is used the optimal location is the medial surface of the tibia proximal to the medial malleolus.
Appendix C – Vascular Access

The William W. Backus Hospital

2014 Paramedic Guidelines

4. Prepare the selected site using aseptic technique.
5. Insert the intraosseous needle using a twisting (boring) motion with the needle perpendicular to the bone and the bevel pointing away from the joint space. A rotary motion is used with a downward pressure until there is a slight decrease in resistance indicating that the cortex of the bone has been punctured. The needle usually does not need to be advanced any further. The distance from the skin through the cortex is rarely more than 1 cm in an infant or child and penetration at this depth is usually adequate.
6. Remove the stylette.
7. Confirm placement in the marrow cavity.
   a. Sensation of “pop” when marrow space is entered
   b. Ability of needle to stand firmly (no wobble when held)
   c. Ability to aspirate marrow with syringe
   d. Free flow of fluid
8. Attach IV tubing and observe for extravasation of fluids into surrounding soft tissue.
9. Continuously monitor the intraosseous infusion set.
# Appendix D - Cardiac

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</table>
ELECTRICAL CARDIOVERSION

The patient’s unstable condition must be related to the tachycardia. Signs and symptoms of hemodynamic instability may include chest pain, SOB, hypotension, signs and symptoms of CHF, decreased level of consciousness and shock.

**THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.**

**Routine Paramedic Care:**

GENERAL PRACTICE, p 5.

If the ventricular rate is > 150 BPM, prepare for immediate cardioversion. Cardioversion is seldom needed for heart rates less than 150 BPM.

ADMINISTER

DIAZEPAM¹

2 – 5 mg slow IVP may be repeated after 5 min

Max Dose of Diazepam on standing order: 10 mg IVP

-OR-

VERSED¹

2 - 4 mg IVP may be repeated once after 5 min

IF NO IV, ADMINISTER

VERSED¹

2 - 4 mg IM or

APPROPRIATE WEIGHT BASED

INTRANASAL DOSE³

Does the Rhythm Convert?

ESTABLISH MEDICAL CONTROL

NO

YES

PERFORM SYNCHRONIZED CARDIOVERSION²

100 J, 200 J, 300 J, 360 J

(or clinically equivalent biphasic energy dose)

*For PSVT and A Flutter

May start at 50 J

ESTABLISH MEDICAL CONTROL

NOTES

1 Indicated for any conscious and alert patient. VERSED and DIAZEPAM may be administered only with a B/P > 90 mmHg systolic.

² In the event the patient becomes unconscious and pulseless, then unsynchronized counter-shock at the appropriate joules should be initiated immediately.

³ To determine the appropriate weight based dose of versed review the Intranasal Midazolam Protocol in the Medication appendix page 125.
STEPS FOR SYNCHRONIZED CARDIOVERSION

1. Consider sedation
   - Diazepam: 2-5 mg slow IV push. May repeat if necessary.
   - Versed: 2 to 4 mg IV push. May repeat if necessary.
2. Turn on defibrillator.
3. Attach monitor leads to the patient and ensure proper display of the patient’s rhythm.
4. Engage the synchronization mode by pressing the “sync” control button.
5. Look for markers on the R waves indicating sync mode.
   - If necessary, adjust monitor gain until the sync markers occur with each R wave.
6. Select the appropriate energy level (or clinically equivalent biphasic energy dose.)
   - PSVT: 50J, 100J, 200, 300J, 360J
   - Aflutter: 50J, 100J, 200, 300J, 360J
   - Afib: 100J, 200, 300J, 360J
   - VT: 100J, 200, 300J, 360J
   - Monophasic energy dose or clinically equivalent biphasic energy dose.
7. Position the conductor pads on patient.
8. Announce to team members “Charging the defibrillator-stand clear!”
9. Press the “charge” button.
10. Clear team members from patient. Be sure no one is in contact with the patient or stretcher. Remove bag-valve-mask from patient.
11. Apply 25 pounds of pressure to both paddles.
12. Press the “shock” button.
13. Check the monitor. If tachycardia persists, increase the joules according to the electrical cardioversion algorithm.
14. Reset the sync mode after each synchronized cardioversion because most defibrillators default back to unsynchronized mode. This default allows an immediate shock if the cardioversion produces VF.
The primary indications for TCP in the prehospital setting are symptomatic bradycardia, heart blocks associated with poor cardiac output that is unresponsive to atropine, pacemaker failure and new onset asystole.

Emergency Pacing Indications
- Hemodynamically compromising bradycardia (B/P < 90 mmHg systolic, change in mental status, myocardial infarction, pulmonary edema) including:
  - Complete heart block
  - Symptomatic second degree heart block
  - Sick sinus syndrome
  - Drug induced bradycardia (i.e. digoxin, beta blockers, calcium channel blockers)
  - Permanent pacemaker failure
  - Idioventricular bradycardia
  - Refractory bradycardia with signs of shock
  - Bradysystole
- Bradycardia with malignant escape rhythms (unresponsive to pharmacological therapy)
- Overdrive pacing of refractory tachycardia (requires on-line medical direction)

Standby Pacing Indications
- Stable bradycardia (B/P >90 mmHg systolic, no evidence of hemodynamic compromise)
- Second degree mobitz II heart blocks
- Stable complete heart blocks (B/P >90 mmHg systolic, no evidence of hemodynamic compromise)

Contraindications to pacing
- Pediatric patients under 33lbs., unless appropriate size pads are available

Procedure
1. Monitor SpO₂
2. Turn on EKG monitor.
3. Attach monitor leads to the patient and ensure proper display of the patient’s rhythm.
4. Establish IV access.
5. Clean or shave, if necessary, over the area where the pacing electrodes are to be placed
6. Place the pacing electrodes on the patient.
   a. Anterior/posterior placement: The negative lead is placed on the left anterior chest, about halfway between the xiphoid process and the left nipple with the upper edge of the electrode just below the nipple line. The positive lead is placed on the left posterior chest just below the scapula and lateral to the spine.
   b. Anterior/lateral placement: The negative electrode is placed on the left lateral chest over the fourth intercostal space in the mid-axillary line. The positive electrode is placed on the anterior right in the subclavicular area.
7. Turn the pacemaker on.
8. If intrinsic beats are present, insure corresponding pulses.
9. With hemodynamically unstable bradycardia consider sedation for the patient.
   - Diazepam 2-5 mg slow IVP. It may be repeated in 3-5 minutes if sedation is inadequate. Maximum dose of diazepam is 10 mg.
   - Versed 2 – 4 mg IVP may be administered. It also may be repeated at the initial dose in 3-5 minutes.
   - In both cases systolic B/P must be > 90 mmHg.
10. Select the pacing rate to 70 BPM (inclusive of the intrinsic beats).
11. Slowly increase the output until capture is achieved.
12. With bradyasystole, turn the current to the maximum setting. If capture is achieved decrease the output and continue to watch for capture.
13. Assess for changes in vital signs and patient comfort, where applicable.

NOTES

Muscle contraction (usually the chest wall or the diaphragm) is notable during pacing, especially at high outputs. Assessments of cardiac pulsations by palpation are therefore unreliable during cardiac output pacing.
**12 LEAD EKG**

Early identification of cardiac infarction is crucial because the benefits of thrombolytic therapy are time dependent. The 12 lead EKG is one component used for early recognition of an infarct and should be obtained with any patient presenting with symptoms typical of an acute coronary syndrome (ACS). ACS should be suspected with patients complaining of chest discomfort with radiation to the back or left arm, but also in those with right arm, shoulder, back, or epigastric pain. Anxiety, restlessness, nausea, vomiting, dyspnea, and diaphoresis may additionally accompany the syndrome. Use of the 12-lead EKG in the pre-hospital setting should NOT prolong field times or delay implementation of already existing chest pain guidelines.

**Indications**
- Chest discomfort (of suspected cardiac ischemic origin)
- Epigastric pain
- Dyspnea (when suspected to be cardiac related)
- CHF/Pulmonary edema
- Cardiogenic shock
- Diaphoresis disproportionate with surrounding environment
- Syncope or near syncope

**Precautions**
- Do not delay scene time for more than 4 minutes to perform a 12 lead EKG.
- If the patient is in close proximity to the hospital and obtaining the 12 lead EKG would be longer than the transport time, routine ALS care and treatment should be initiated and transport.
- The normal 12 lead EKG does not exclude the possibility of ischemic cardiac disease.

**Procedure**
1. Place limb leads on the extremities close to the wrists and ankles, not over bones.
2. Place V1 lead in the 4th intercostal space, just to the right of the sternum.
3. Place V2 lead in the 4th intercostal space just to the left of the sternum.
4. Place V4 lead in the 5th intercostal space left of the sternum, midclavicular line.
5. Place the V3 lead between the V2 and V4 leads.
6. Place V6 lead mid-axillary line, horizontal with V4.
7. Place V5 lead anterior – axillary line horizontal with V4 between V4 and V6.

**NOTES**
Upon arrival at the receiving hospital, a copy of the 12 lead EKG should be given to the attending physician and/or nurse.
If a 12 lead EKG was not obtained, and the patient was treated for signs and/or symptoms related to the above, the reason for lack of the EKG must be documented on the run form.
**VAGAL MANEUVERS**

Vagal maneuvers slow the heart and decrease the force of atrial contraction by stimulating parasympathetic nerve fibers in the wall of the atria and specialized tissues of the SA and AV nodes via the vagus nerve. Vagal Maneuvers may be used to terminate PSVT provided the patient is hemodynamically stable.

---

**Indications:**
- To slow or convert supraventricular tachycardia to a more stable rhythm.
- To aid in the identification of other narrow complex tachydysrhythmias, such as atrial flutter with rapid ventricular response, by increasing parasympathetic tone, slowing conduction through the AV node long enough to allow rhythm recognition.

**Contraindications:**
Carotid sinus massage should not be performed on any patient with a history of:
- Sick sinus syndrome
- Carotid bruits
- Cerebral vascular disease
- Digitalis toxicity

**Complications:**
Carotid sinus massage has been documented as causing:
- CVA
- Syncope
- Sinus arrest
- Asystole
- Heart blocks
- Paradoxical tachydysrhythmias (secondary to digitalis toxicity)

**Equipment:**
- Oxygen
- Cardiac monitor
- Intravenous line in place
- Full ALS equipment

**Valsalva Maneuver Procedure:**
1. Administer oxygen
2. Establish IV access
3. Continually monitor cardiac rhythm (record during procedure)
4. Obtain 12 lead EKG
5. If tolerated place the patient supine
6. Prepare to treat any resulting dysrhythmia
7. Instruct the patient to inhale and attempt to exhale against closed glottis (bear down as though trying to have a bowel movement)
8. Stop the procedure immediately if the rhythm slows or if the patient experiences dizziness or a mental status change.

**Carotid Sinus Massage** (Adults only)
1. Administer oxygen
2. Establish IV access
3. Continually monitor cardiac rhythm (record during procedure)
4. Obtain 12 lead EKG
5. Explain the procedure to the patient.
6. If tolerated place the patient supine

---

THIS IS AN OFF-LINE MEDICAL CONTROL PROCEDURE.
7. Check quality of carotid pulses separately by palpating arteries. If the pulse on either side is weak, **do not perform the procedure**.
8. Auscultate for bruits. If bruits are present **do not perform the procedure**.
9. Turn the patient’s head to the left and with two fingers firmly massage the right side of their neck at the carotid bifurcation (just below the angle of the jaw) for 3 to 5 seconds.
10. If no response, switch to other side and perform the procedure again. **Never massage both sides simultaneously**.
11. Stop the procedure when the heart rate slows or if the patient experiences dizziness or suffers from a sudden change in mental status.

**Mammalian Dive Reflex**

1. Administer oxygen
2. Establish IV access
3. Continually monitor cardiac rhythm (record during procedure)
4. Obtain 12 lead EKG
5. Explain the procedure to the patient.
6. Use an ice pack or place crushed ice in a plastic bag, glove or washcloth and apply it firmly over the patients mid-face for approximately 15 seconds. Do not occlude the patient’s airway.
7. Stop the procedure when the heart rate slows or if the patient experiences dizziness or suffers from a sudden change in mental status.
~ APPENDIX E - TRAUMA ~

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TRAUMA ALERT ACTIVATION

Trauma Alert criteria is based on the presence of physiological abnormalities. However, mechanism of injury is important to heighten your index of suspicion that there may be a serious injury. In the absence of physiological abnormalities with a significant mechanism of injury Medical Control must be contacted.

<table>
<thead>
<tr>
<th>Indications:</th>
<th>Procedure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma patients with any of the following physiologic derangements’ require trauma alert activation:</td>
<td>1. It is important to notify the Emergency Department as soon as possible of the Trauma Alert. To request an alert the following procedure should be followed:</td>
</tr>
<tr>
<td>• Systolic BP &lt; 90 (adult)</td>
<td>2. Contact the emergency department charge nurse by radio or telephone</td>
</tr>
<tr>
<td>• Respiratory distress or airway problems</td>
<td>3. Specifically state you are requesting a trauma alert</td>
</tr>
<tr>
<td>• Altered mental status - GCS &lt;13</td>
<td>4. Give patient approximate age, sex, LOC, mechanism of injury and which of the criteria the patient meets.</td>
</tr>
<tr>
<td>• Paralysis</td>
<td>5. Vital signs should be obtained prior to trauma alert activation but should not significantly delay the trauma alert.</td>
</tr>
<tr>
<td>• Penetrating injury to head, neck, chest, torso extremities proximal to knee or elbow</td>
<td>6. Give an update as soon as possible.</td>
</tr>
<tr>
<td>• Patient with flail chest</td>
<td>7. Estimated time of arrival to the emergency department. (Required)</td>
</tr>
<tr>
<td>• Electrical / thermal burn (BSA &gt;30% adults, &gt;20% pediatric)</td>
<td>• Significant hypotension, as indicated for adult patients in the table below:</td>
</tr>
<tr>
<td>• Amputation of limb</td>
<td>If unable to palpate a pulse at: Systolic B/P is probably</td>
</tr>
<tr>
<td>• Long bone fractures on 2 or more limbs</td>
<td>Radial artery &lt; 90 mmHg</td>
</tr>
<tr>
<td>• Crushed, degloved, or mangled extremity</td>
<td>Brachial artery &lt; 80 mmHg</td>
</tr>
<tr>
<td>• Pelvic fractures</td>
<td>Femoral artery &lt; 70 mmHg</td>
</tr>
<tr>
<td>• Open or depressed skull fracture</td>
<td>Carotid artery &lt; 60 mmHg</td>
</tr>
<tr>
<td>• Significant injuries above and below the diaphragm</td>
<td>Traumatic arrest is not an indication for trauma alert activation, unless:</td>
</tr>
<tr>
<td>• Falls &gt; 30’ adult or &gt;20’ child</td>
<td>• The patient is &lt; 18 years old and does not meet obvious death criteria as described on page 19 of the Operational Conflicts section of this manual.</td>
</tr>
</tbody>
</table>

Patients in traumatic arrest, that have a return of spontaneous circulation, should receive a request for trauma alert activation.

NOTES

• If the ETA is > 10 minutes, a second med patch to the emergency department must be made with a set of vital signs.
• If reassessment and/or improvement in the patient’s status warrants, the trauma alert may be cancelled.
• Vital signs are not required. However, a reasonable effort should be made to obtain them prior to calling for the trauma alert.
• ETA is required.
SELECTIVE SPINAL IMMOBILIZATION

Although it is unlikely, it is possible to have a significant injury to the spine without spine pain or tenderness on exam, even in a reliable patient. In these cases, some abnormality of motor or sensory function will be found if the exam and the patient are reliable.

Positive mechanism
A positive mechanism refers to violent impact forces that are clearly capable of damaging the bony spinal column. These would be criteria for immobilization.

- Any mechanism that produced a violent impact to the head, neck, torso or pelvis (e.g., assault, entrapment in vehicle or structural collapse, etc.)
- Incidents producing sudden acceleration, deceleration, or lateral bending forces to the neck or torso (e.g., moderate-to high speed MVC, pedestrian struck, involvement in an explosion, etc.)
- High velocity MVA
- Ejection from a vehicle
- Pedestrian struck by vehicle traveling > 20 MPH
- Fall from >15ft or in which the patient is elderly
- Diving accidents
- Starred windshield
- Penetrating trauma to head, chest, abdomen, neck, groin or near the spine.
- Fall with injury above the clavicles
- Any mechanism causing a head (brain) injury
- Any patient meeting CODE RED criteria!

Uncertain mechanism
Sometimes the mechanism of injury is unclear, or there is uncertainty regarding the impact and forces involved. The spine may or may not be injured, and the mechanism alone does not give a clear indication. When the mechanism is uncertain, clinical criteria provide a much more practical approach to assessment that is well documented, safe, and easy to use: if the patient has any of the signs/sx of spinal compromise or is an unreliable patient, immobilization must be performed as a precaution.

- Unreliable patient
- Acute stress reaction
- Altered mental status
- Intoxication
- Distracting injuries
- Inability to communicate

Signs and symptoms of spinal compromise

- Deformity
- Pain
- Tenderness
- Decrease or loss of muscle strength
- Decreased, abnormal, or loss of sensation

Spine immobilization may safely be omitted in patients with an uncertain mechanism of injury who meet all five of the below criteria:

- Age between 12 and 65
- No spine tenderness or pain
- Normal motor / sensory exam (see below)
- Reliable patient exam (calm, cooperative, no ETOH/drug use, alert & oriented, communicates effectively)
- No positive mechanism of injury

WHEN IN DOUBT, APPLY SPINAL IMMOBILIZATION.
MOTOR FUNCTION-UPPER EXTREMITIES

Finger Abduction/Adduction
This tests the interosseous muscle function, controlled by the T-1 nerve root. Instruct the patient by demonstration to spread the fingers of both hands and to keep them spread while you try to squeeze the 4th and 2nd fingers together. Normal resistance should feel like a spring, and both the right and left sides should have equal strength.

Finger/Hand Extension
This tests the extensors of the hand and fingers, both of which are controlled by the C-7 nerve root. Instruct the patient by demonstration to hold both hands and fingers straight out and to keep them out while you try to push them down. Support the arm at the wrist to avoid testing arm function. Normal resistance should resist moderate pressure, and both the right and left sides should have equal strength.

MOTOR FUNCTION-LOWER EXTREMITIES

Foot Plantar Flexion
This tests the plantar (down) flexors of the foot, controlled by the S-1, S-2 nerve roots. Place your hands on the soles of both feet, and instruct the patient to push against your hands, like “pushing down on the gas pedal.” Both right and left sides should feel strong and equal.

Foot/Great Toe Dorsiflexion
This tests the dorsal (up) flexors of the foot and great toe, controlled by the L-5 nerve root. Hold the foot firmly, and instruct the patient to pull back on the foot, like “pulling back toward your nose.” Both right and left sides should feel strong and equal.
SENSORY EXAM-UPPER AND LOWER EXTREMITIES

Question the patient regarding abnormal sensation
If the patient reports weakness, numbness, paresthesia (tingling), or radicular (“electric” or “shooting”) pain in one of the extremities, the sensory exam is considered to be abnormal and no further testing is necessary.

Pain Sensation-Upper/Lower Extremities
This tests sensation to pain (pinprick), which is controlled by the spinothalamic tracts of the anterior cord and gives us the most useful information regarding cord injury. Sensation to light touch is carried in many tracts of the spinal cord and can remain intact even with significant cord injury. It is important to isolate and test for pinprick sensation only and to avoid confusing the exam with response to light touch.

Pinprick Sensation-Upper/Lower Extremities
To test pinprick sensation and to separate it from light touch, you will need both a sharp object and a dull object. Avoid very sharp objects that might puncture the skin and cause bleeding: also avoid re-use of sharp objects and the risk of blood borne pathogen contamination. Ask the patient to close their eyes and to hold out their hands. Touch the patient at an uninjured site on the lower arm or hand with both the sharp and dull objects and determine the patient’s ability to distinguish the two.

- “Can you feel me touching your hand? Does it feel sharp or dull?”
- Does this _____ feel the same as this _____?
- Compare pinprick sensation at the same site on both sides of the body.
- Perform same exam on the lower extremities

The sensory exam described above should pick up unusual clinical patterns of incomplete cord injury. Symptoms are an important part of the sensory exam. If the patient reports weakness, numbness, paresthesia, or radicular pain, the sensory exam is considered to be abnormal. **Immobilize these patients!**

REMOVAL OF SPINAL IMMOBILIZATION

Paramedics shall not remove spinal immobilization placed by another EMS responder unless the immobilization compromises the patient’s life or limb or a higher level of care deemed spinal precautions were unnecessary.
**DOCUMENTATION OF SELECTIVE SPINAL IMMOBILIZATION**

**Documentation**
Complete an approved William W. Backus Hospital Spinal Clearance documentation form. Document the following criteria:

- No spine tenderness
- No spine pain
- Normal motor exam
- Normal sensory exam
- Reliable patient exam (calm, cooperative, no ETOH/drug use, alert & oriented, communicates effectively)
- No positive mechanism of injury

A copy of the completed form must be attached to each copy of the completed patient care report. In the event the paramedic cleared the spine and is not accompanying the patient to the hospital:

1. The form must be completed prior to leaving the patient with the ambulance crew
2. A copy must be left with the ambulance crew to be attached to their completed patient care report
3. A copy is to be attached to each copy of the paramedic’s patient care report and submitted to the service sponsoring the paramedic and the William W. Backus Hospital EMS Coordinator.

---

**THE WILLIAM W. BACKUS HOSPITAL**
PreHospital Care
Norwich, CT

Selective Spinal Immobilization Documentation Form

<table>
<thead>
<tr>
<th>Patient Name:</th>
<th>Age:</th>
<th>Medic Service:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>□ AASI □ MTFD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanism of Injury:</th>
<th>Transporting Service:</th>
<th>Vehicle Name/No.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- □ Reliable patient exam
- □ No spine tenderness
- □ No spine pain
- □ Normal motor exam
- □ Normal sensory exam
- □ No positive mechanism of injury

**Notes/Comments:**

---

<table>
<thead>
<tr>
<th>Medic Name:</th>
<th>License #:</th>
<th>Signature:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

White: Original Run Report  Yellow: Yellow Copy of Run Report  Pink: Blue Copy of Run Report
## GLASGOW COMA SCORES

<table>
<thead>
<tr>
<th>EYES</th>
<th>ADULT</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open spontaneously during initial assessment</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Open to verbal stimulus</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Open only to painful stimulus</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Do not open</strong> during initial evaluation period.</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VERBAL</th>
<th>ADULT</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oriented to person, place and time</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Converses, but is <strong>disoriented or confused</strong></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Disoriented, speech clear but <strong>inappropriate</strong></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Garbled. Includes grunting moaning, non-specific sounds</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>No verbal responses</strong> to any stimulation</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MOTOR</th>
<th>ADULT</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obeys verbal commands by moving extremities or facial muscles (if C-spine injuries)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Can <strong>localize</strong> a painful stimulus by moving an extremity to an injured area in a purposeful manner</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Withdraws</strong> an extremity from painful stimulus, but unable to localize/prevent recurring pain</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Abnormal <strong>flexor response</strong> to painful stimulus, i.e. Decorticate (flexion) posturing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Abnormal <strong>extensor response</strong> to painful stimulus, i.e. decerebrate (extension) posturing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>No response</strong>, no motion to any painful stimulus</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Glasgow Coma Score = “eyes” score + “verbal” score + “motor” score:  

199
## REVISED TRAUMA SCORE

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>METHOD</th>
<th>VALUES</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory Rate</strong></td>
<td>Count respiration in 15 seconds, then multiply by 4</td>
<td>10-24</td>
<td>= 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25-35</td>
<td>= 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;36</td>
<td>= 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-9</td>
<td>= 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>= 0</td>
</tr>
<tr>
<td><strong>Systolic Blood Pressure</strong></td>
<td>Measure systolic B/P with stethoscope or by palpation</td>
<td>&gt; 90</td>
<td>= 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70-89</td>
<td>= 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50-69</td>
<td>= 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-49</td>
<td>= 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>= 0</td>
</tr>
<tr>
<td><strong>Glasgow Coma Score</strong></td>
<td>EYES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spontaneous</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verbal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Painful</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NONE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>VERBAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oriented</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confused</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inappropriate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grunts/moans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NONE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOTOR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Obeys</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Localizes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Withdraws</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flexion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NONE</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sum of these three sections: Eyes + Verbal + Motor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CONVERSION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sum</td>
<td>13-15</td>
<td>= 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9-12</td>
<td>= 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-8</td>
<td>= 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-5</td>
<td>= 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 4</td>
<td>= 0</td>
</tr>
<tr>
<td><strong>CONVERTED SCORE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REVISED TRAUMA SCORE:**
Sum of Respiratory Rate + Blood Pressure + Converted GCS score
EVALUATION OF BURNS

The size or extent of a burn wound is expressed as a percentage of the total body surface area. It can be calculated by using the Rule of Nines.

Superficial burns (first degree burns)
- Injury to dermis only
- Red, inflamed skin, painful to touch
- Generally no pre-hospital treatment needed

Partial thickness burns (second degree burns)
- Injury to both epidermis and dermis
- Skin presents with reddened areas, blisters, or open, weeping wounds
- Usually very painful
- Significant fluid loss occurs with subsequent shock

Full thickness burns (third degree burns)
- Injury to the epidermis, dermis, and subcutaneous tissue (possibly deeper)
- May look charred or leathery
- Not painful (although associated second degree burns will cause pain)
- No capillary refill

Palm Rule: The size of the patient’s palm = 1% TBSA
# PEDIATRIC TRAUMA SCORE

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight</strong></td>
<td></td>
</tr>
<tr>
<td>1. Weight: &gt; 20 kg</td>
<td>+2</td>
</tr>
<tr>
<td>2. Weight: 10-20 kg</td>
<td>+1</td>
</tr>
<tr>
<td>3. Weight: &lt; 10 kg</td>
<td>-1</td>
</tr>
<tr>
<td><strong>Airway</strong></td>
<td></td>
</tr>
<tr>
<td>1. Normal Airway</td>
<td>+2</td>
</tr>
<tr>
<td>2. Maintained Airway</td>
<td>+1</td>
</tr>
<tr>
<td>3. Invasive Airway</td>
<td>-1</td>
</tr>
<tr>
<td><strong>Systolic Blood Pressure</strong></td>
<td></td>
</tr>
<tr>
<td>1. SBP &gt; 90 mmHg</td>
<td>+2</td>
</tr>
<tr>
<td>2. SBP 50-90 mmHg</td>
<td>+1</td>
</tr>
<tr>
<td>3. SBP &lt; 50 mmHg</td>
<td>-1</td>
</tr>
<tr>
<td><strong>Central Nervous System</strong></td>
<td></td>
</tr>
<tr>
<td>1. Awake</td>
<td>+2</td>
</tr>
<tr>
<td>2. Obtunded</td>
<td>+1</td>
</tr>
<tr>
<td>3. Coma</td>
<td>-1</td>
</tr>
<tr>
<td><strong>Open Wound</strong></td>
<td></td>
</tr>
<tr>
<td>1. None</td>
<td>+2</td>
</tr>
<tr>
<td>2. Minor Open Wound</td>
<td>+1</td>
</tr>
<tr>
<td>3. Major Open Wound</td>
<td>-1</td>
</tr>
<tr>
<td><strong>Skeletal Trauma</strong></td>
<td></td>
</tr>
<tr>
<td>1. None</td>
<td>+2</td>
</tr>
<tr>
<td>2. Closed Fracture</td>
<td>+1</td>
</tr>
<tr>
<td>3. Open or Multiple Fractures</td>
<td>-1</td>
</tr>
</tbody>
</table>

**TOTAL**

**Interpretation**

Score Range: +12 to −6  
Trauma score: < or = 8 indicates a significant mortality risk
~ APPENDIX F - PEDIATRICS ~

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APGAR SCORING SYSTEM

Calculate the APGAR scores at 1 and 5 minutes of life. Determination of the APGAR scores should not delay resuscitation.

<table>
<thead>
<tr>
<th>PHYSICAL SIGN</th>
<th>0 POINTS</th>
<th>1 POINT</th>
<th>2 POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate</td>
<td>Absent</td>
<td>&lt; 100</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Respiratory effort</td>
<td>Absent</td>
<td>Slow, irregular (or weak cry)</td>
<td>Normal (or strong cry)</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Limp</td>
<td>Some flexion</td>
<td>Active motion</td>
</tr>
<tr>
<td>Reflex irritability</td>
<td>No response</td>
<td>Grimace, some motion</td>
<td>Cough or sneeze, vigorous cry</td>
</tr>
<tr>
<td>Color</td>
<td>Blue, pale</td>
<td>Mucous membranes pink, nail beds blue</td>
<td>Mucous membranes and nail beds pink</td>
</tr>
</tbody>
</table>
## PEDIATRIC VITAL SIGNS CHART

Weight and vital signs by age group

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight kg</th>
<th>Weight lbs</th>
<th>Respiration</th>
<th>Pulse</th>
<th>Systolic Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>3-4</td>
<td>6-9</td>
<td>30-50</td>
<td>120-160</td>
<td>60-80</td>
</tr>
<tr>
<td>6 month –1 yr.</td>
<td>8-10</td>
<td>16-22</td>
<td>30-40</td>
<td>120-140</td>
<td>70-80</td>
</tr>
<tr>
<td>2-4 years</td>
<td>12-16</td>
<td>24-34</td>
<td>20-30</td>
<td>100-110</td>
<td>80-95</td>
</tr>
<tr>
<td>5-8 years</td>
<td>18-26</td>
<td>36-55</td>
<td>14-20</td>
<td>90-100</td>
<td>90-100</td>
</tr>
<tr>
<td>8-12 years</td>
<td>26-50</td>
<td>55-110</td>
<td>12-20</td>
<td>80-100</td>
<td>100-110</td>
</tr>
<tr>
<td>&gt; 12 years</td>
<td>&gt; 50</td>
<td>&gt; 110</td>
<td>12-20</td>
<td>60-90</td>
<td>100-120</td>
</tr>
</tbody>
</table>
### GLASGOW COMA SCALE for CHILDREN and INFANTS

<table>
<thead>
<tr>
<th>EYES</th>
<th>CHILD</th>
<th>INFANT</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open spontaneously during initial assessment</td>
<td>Open spontaneously during initial assessment</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Open to verbal stimulus</td>
<td>Open to verbal stimulus</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Open only to painful stimulus</td>
<td>Open only to painful stimulus</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Do not open during initial evaluation period.</td>
<td>Do not open during initial evaluation period.</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VERBAL</th>
<th>CHILD</th>
<th>INFANT</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oriented to person, place and time</td>
<td>Coos and babbles</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Converes, but is disoriented or confused</td>
<td>Irritable and cries</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Disoriented, speech clear but inappropriate</td>
<td>Cries to pain</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Garbled. Includes grunting moaning, non-specific sounds</td>
<td>Moan to pain</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>No verbal responses to any stimulation</td>
<td>No verbal responses to any stimulation</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MOTOR</th>
<th>CHILD</th>
<th>INFANT</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obey verbal commands by moving extremities or facial muscles (if C-spine injuries)</td>
<td>Moves spontaneously and purposely.</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Can localize a painful stimulus by moving an extremity to an injured area in a purposeful manner</td>
<td>Withdraws to touch</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Withdraws an extremity from painful stimulus, but unable to localize/prevent recurring pain</td>
<td>Withdraws in response to painful stimulus</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Abnormal flexor response to painful stimulus, ie. Decorticate (flexion) posturing</td>
<td>Abnormal flexor response to painful stimulus, ie. Decorticate (flexion) posturing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Abnormal extensor response to painful stimulus, ie. Decerebrate (extension) posturing</td>
<td>Abnormal extensor response to painful stimulus, ie. Decerebrate (extension) posturing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>No response, no motion to any painful stimulus</td>
<td>No response, no motion to any painful stimulus</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Glasgow Coma Score = “eyes” score + “verbal” score + “motor” score:
## DISTINGUISHING PEDIATRIC SINUS TACHYCARDIA, SVT AND V-TACH

<table>
<thead>
<tr>
<th>Feature</th>
<th>Sinus Tachycardia</th>
<th>Supraventricular Tachycardia</th>
<th>Ventricular Tachycardia</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>Fever</td>
<td>Congenital heart disease</td>
<td>Serious systemic illness</td>
</tr>
<tr>
<td></td>
<td>Volume loss</td>
<td>Known SVT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypoxia</td>
<td>Nonspecific symptoms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pain</td>
<td>e.g., poor feeding, fussy</td>
<td></td>
</tr>
<tr>
<td>Heart rate</td>
<td>&lt; 220 beats/min</td>
<td>&gt; 220 beats/min, often 240-300 beats/min</td>
<td>&gt; 150 beats/min</td>
</tr>
<tr>
<td>Respiration</td>
<td>Variable</td>
<td>Constant</td>
<td>Variable</td>
</tr>
<tr>
<td>QRS Interval</td>
<td>Narrow, &lt;0.08 sec</td>
<td>Narrow, &lt;0.08 sec</td>
<td>Narrow, &gt;0.08 sec</td>
</tr>
<tr>
<td>Assessment</td>
<td>Hypovolemia</td>
<td>CHF may be present</td>
<td>CHF may be present</td>
</tr>
<tr>
<td></td>
<td>Hypoxia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Painful injury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible Treatments</td>
<td>Fluids Oxygen Splinting Analgesia/sedation</td>
<td>Vagal maneuvers Adenosine Synchronized electrical countershock</td>
<td>Synchronized electrical countershock Lidocaine</td>
</tr>
</tbody>
</table>
~ APPENDIX G - ADMINISTRATIVE ~

REQUIREMENTS TO MAINTAIN MEDICAL CONTROL ................................................................. 211
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REQUIREMENTS TO MAINTAIN MEDICAL CONTROL

Paramedics must comply with all state and hospital regulations pertaining to continuing medical education and licensure. They include:

- 24 hours of CME hours annually. The calendar year, January –December will be used to verify annual CME hours.
  - Backus Hospital offers 24 hours of CME education through scheduled monthly lectures.
  - At a minimum 12 hours per year of CME must be completed at Backus Hospital.
  - An additional 12 hours may be completed in a variety of ways including: seminars, courses and agency sponsored medical training.
  - On-line CME credit will be awarded on a case-by-case basis.
  - Teaching CME classes may count towards CME credit by prior approval of the EMS Coordinator.

- Successful completion of the annual skill assessment review practical.

- Current CPR certification.

- Current ACLS certification.

- Current PALS certification

- Current PHTLS certification

- Bi-annual paramedic refresher is encouraged but not required. The paramedic refresher may be used to supplement the continuing education requirement.

NOTES

Students in various medical classes (RN, PA, etc.) may be excused from CME (without make-ups) with prior approval, but must resume attendance at CME after completion of the class.

Paramedics that fail to comply with the CME requirements and/or allow their certifications to lapse are subject to suspension of their medical control privileges. Grace periods may be considered but are subject to prior approval from the Prehospital Medical Director. Remedial education will be at the discretion of the Backus Hospital Prehospital Medical Director and the EMS Coordinator.
REGAINING MEDICAL CONTROL

Prior Medical Control or Prolonged Absence

Any individual with previous Medical Control privileges, from Backus Hospital who has had a period of prolonged absence, must complete the following to regain their Medical Control privileges:

If the absence is greater than 90 days, but less than six months:

- He/she must precept for a minimum of five (5) to ten (10) ALS calls.
- Evaluations & PCR will be completed by individual/preceptor and submitted to the EMS Coordinator.
- Meeting with Medical Director after 5-10 calls completed.
- Medical Director may require additional calls or decline granting medical control.

If the absence is greater than six months:

1. Submit an application for Medical Control with the Backus Hospital EMS Coordinator.
   a. Present copies of all current certifications prior to precepting including: a valid CT Paramedic License, CPR, ACLS, PALS and PHTLS.
2. Completion of the Backus Hospital Paramedic Guideline exam with a minimum score of 80%.
3. Have an interview with a medical control representative.
4. He/she must demonstrate proficiency at performing paramedic skills in a controlled environment, i.e., IV therapy, endotracheal intubation, etc. and may be required to participate in a practical skills evaluation which will be provided by a medical control representative. These may be skipped with permission from the Prehospital Medical Director on an individual basis.
   - He/she must precept for a minimum of ten (10) to twenty (20) ALS calls.
   - Evaluations & PCR will be completed by individual/preceptor and submitted to the EMS Coordinator.
   - Meeting with Medical Director after 10 calls completed.
   - Medical Director may require additional calls or decline granting medical control.

REMEDIATION

The need for remediation will be based on documented field performance in a given area of patient care that is poor. Perceived poor performance is not grounds for remedial consideration. Only documented cases are. At any point, remediation may be deemed necessary to avoid or correct potential problems. During this time, it is the discretion of the Prehospital Medical Director as to whether or not the paramedic may continue to practice. The Prehospital Medical Director is also responsible to determine the remediation process for the paramedic.

NOTE

The precepting period may be extended at the discretion of the Backus Hospital Prehospital Medical Director or he/she may elect to grant or withhold medical control pending remediation and further testing. Individual circumstances of prolonged absences may be granted a waiver from precepting. These cases will be reviewed and decided upon by the prehospital medical director on a case-by-case basis.
PRECEPTOR PROGRAM

Credentialed Preceptors

Only licensed, medically authorized paramedics, credentialed as paramedic preceptors through the W. W. Backus Hospital medical control will provide field supervision for preceptee's. The precepting program exists only because individual paramedics have agreed to act as preceptors. The preceptee is expected to treat the preceptors and all EMS personnel with the respect due them as health care professionals.

Becoming a Paramedic Preceptor

Selection for preceptorship is based upon the following criteria:

1. The preceptor candidate will complete an application to become a paramedic preceptor. This application must be signed by the service preceptor administrator and the service Medical Director and submitted to the EMS Coordinator.
2. Candidate must be a State of Connecticut licensed paramedic, having medical control for at least two (2) years.
3. Candidate must be an employee in good standing with their service and Backus Hospital Medical Control.
4. Candidate must never have had medical control privileges suspended or revoked.
5. Candidate must demonstrate above average documentation, skill competency and compliance with Medical Control requirements.
6. Candidate must have favorable results on an oral review board interview.

The preceptor candidate will be reviewed by the Backus Hospital medical control and the precepting team. If the review is favorable, the candidate will be placed on an eligibility list in the order in which the request was received.
DISCIPLINARY ACTION GUIDELINES

PURPOSE

1. To ensure a fair process for problem resolutions in the event(s) that standards of care and/or threat to public health and safety is questioned.

2. To ensure the right of the public to receive quality care from Mobile Intensive Care (MIC) personnel sponsored by Backus Hospital.

3. To ensure that MIC technicians and services are notified of problems, potential problems or areas in need of improvement in a timely basis and provide documentation for quality assurance and due process purposes.

4. To provide pre-hospital providers with an avenue to assure them fundamental fairness and substantial justice when their actions have come under investigation and an opportunity to justify his/her actions and exonerate himself/herself should the complaint prove false.

GUIDELINES

Mobile Intensive Care or “MIC” means prehospital care involving invasive or definitive skills, equipment, procedures, and other therapies.

MIC technicians are expected to follow established protocols, guidelines, and standards of care. Deviations from these may result in corrective, remedial, or disciplinary actions. It should be noted that the purpose of these actions is to improve and assure the quality of care delivered to patients and not to punish MIC technicians or services for deviations. Examples of corrective and remedial actions that may be required include:

- Re-testing of protocols and guidelines
- Skills assessment
- Scheduled clinical time for remediation at Backus Hospital or other approved site/service
- Attendance and successful completion of prescribed courses or training programs.

Serious or repeated deviations will result in the technician being placed on probation until appropriate corrective or remedial actions are taken. Failure to comply with required corrective or remedial actions may result in the suspension or withdrawal of medical control authorization. Those instances that may require corrective or remedial actions include:

- Deviations from established protocols and guidelines
- Deficiencies in quality of care delivered or care delivered which does not meet the standard of care
- Complaints from patients, bystanders, ED staff, or other EMS providers
- Discourtesy to patient, staff, and emergency service personnel
- Inability to meet established performance standards for skills and procedures
- Failure to comply with Backus Hospital requirements for medical control such as applicable certifications, CME requirements, mandated in-service training, etc.

In the event that a MIC technician or service fails to comply with the necessary corrective or remedial actions, or hinders requests from the Backus Hospital to facilitate investigations, the Backus Hospital Prehospital Medical Director may suspend medical control authorization until compliance is accomplished or medical control authorization is withdrawn.

In the event of allegations of gross misconduct, gross negligence, or situations that threaten health or safety, the Backus Hospital Prehospital Medical Director may, in the interest of patient care, withdraw medical control authorization immediately.
PROCESS

Notification of Deficiencies

1. Verbal or written notice will be given to the service chief and/or MIC technician who fail to follow established protocols, guidelines, and standards of care. This notice will also include actions required by the technician/service and recommendations, if any. A copy of this will be sent to the EMS service chief and one copy will be kept on file with the Backus Hospital EMS Coordinator. The service/technician may offer a written explanation for any deficiencies that will be included in this file.

2. In those instances where remediation is required, the MIC technician will contact the EMS Coordinator and/or Prehospital Medical Director to make the necessary arrangements.

3. Repeated occurrences of the same or similar actions may warrant further actions including probation, suspension, and revocation of medical control authorization.

Probation

1. Upon recognition that a problem or potential problem exists, the EMS Coordinator will discuss the situation with the Backus Hospital Prehospital Medical Director.

2. If the Prehospital Medical Director finds sufficient cause, a verbal request will be made or letter will be sent to the MIC technician and/or service requesting that a meeting be held to discuss the situation.

3. At the meeting, the issue(s) are discussed and the individual and/or service are given the opportunity to respond. The MIC technician and/or service may bring any documentation or other persons to corroborate his/her/their findings regarding the issue(s). This conference will take place at the discretion of the Prehospital Medical Director and within reasonable period of time following the incident. The MIC technician and/or service, the EMS Coordinator and Backus Hospital Prehospital Medical Director, will agree to a plan of corrective action.

4. A letter will be sent to the MIC technician and/or service following the meeting which formally places the individual and/or service on probationary status. The letter will also include the following:
   a. Summary of any restrictions
   b. Actions which must be taken to correct deficiencies and/or
   c. The thresholds which must be met to regain full medical control authorization
   d. The date by which the required actions must be completed and/or thresholds met.

   For MIC technicians, a copy will be kept on file with the Backus Hospital EMS Coordinator and a copy sent to the EMS service.

5. On the date set for completion of corrective actions, the Backus Hospital Prehospital Medical Director may take one of the following actions:
   a. Reinstatement full medical control authorization
   b. Extend the period of probation
   c. Request an additional meeting to discuss the situation and further actions which are required
   d. Move to suspend or withdraw medical control authorization

Suspension of Medical Control Authorization

1. Upon recognition that a serious problem exists, a problem exists which has not been corrected through remedial actions, or recommended remedial actions have not been completed, a MIC technician’s and/or service’s medical control authorization may be suspended without first completing probation..
2. A meeting to discuss the problem(s), which may result in suspension of medical control authorization, will be scheduled. The individual and/or service shall be notified of:
   a. The reason(s) for the suspension
   b. Any supporting documentation for the action
   c. The time and place of a meeting to discuss the suspension

Participants shall include the technician(s) involved, the EMS Service Chief or representative, the Backus Hospital Prehospital Medical Director, and the EMS Coordinator.

3. At the meeting, the issue(s) are discussed and the individual and/or service is given the opportunity to respond. The MIC technician and/or service may bring any documentation or other persons to corroborate his/her/their findings regarding the issue(s). This conference will take place at the discretion of the Prehospital Medical Director and within reasonable period of time following the incident.

4. A written report of the findings will be completed within a reasonable period of time following the conference. The report will indicate one of the following:
   a. The Prehospital Medical Director accepts the individual’s and/or service’s explanation of the problem or issue and the matter is considered closed. This may include recommendations to avoid similar incidents in the future, but no further disciplinary action is necessary.
   b. The Prehospital Medical Director finds the explanation of the circumstances to be unacceptable and the individual and/or service will be advised of the measures to be taken to correct the identified problem. If the individual and/or service agrees with the measures to be taken, the following items will be documented: fact that the meeting was held as well as the date, time, place, and those present; the agreed upon measures; and time frame for compliance.
   c. If no mutual agreement can be reached, and/or the problem is such that the safety, health, and welfare of the general public is in imminent danger, the Prehospital Medical Director may summarily suspend medical control of the individual/service, notify OEMS of the circumstances, and request an immediate investigation. When dealing with a service, withdrawal of medical control authorization does not affect the service’s ability to provide the basic level of emergency care. In dealing with an individual, the service should re-assign the individual to work in a non-medical control capacity until the situation is resolved.

5. If the MIC technician and/or service fails to take the necessary action(s) by the established date, medical control authorization will be suspended.

6. The MIC technician and/or service will be sent a letter informing them of the suspension.

Withdrawal of Medical Control Authorization

1. Upon recognition that a serious problem exists, a MIC technician’s and/or service’s medical control authorization may be withdrawn.

2. The individual and/or service shall be notified of:
   a. The reason(s) for the withdrawal of medical control
   b. Any supporting documentation
   c. The time and place of a meeting to discuss the withdrawal of medical control, and

3. Participants shall include the technician(s) involved, the EMS Service Chief or representative, the Backus Hospital Prehospital Medical Director, the EMS Coordinator, and any other directly involved parties.

4. At the meeting, the issue(s) are discussed and the individual and/or service is given the opportunity to respond. The MIC technician and/or service may bring any documentation or other persons to corroborate his/her/their findings regarding the incident. This conference will take place at the discretion of the Prehospital Medical Director and within reasonable period of time following the incident.
5. A written report of the findings will be completed within a reasonable period of time following the conference. The report will indicate one of the following:

   a. The Prehospital Medical Director accepts the individual’s and/or service’s explanation of the circumstances and the matter is considered closed. This may include recommendation to avoid similar incidents in the future, but no further disciplinary action is necessary.

   b. The Prehospital Medical Director finds the explanation of the circumstances to be unacceptable and the individual and/or service will be advised of the measures to be taken to correct the identified problem. If the individual and/or service agrees with the measures to be taken, the following items will be documented: fact that the meeting was held as well as the date, time, place and those present; the agreed upon measures; and time frame for compliance.

   c. If no mutual agreement can be reached, and if the problem is such that the safety, health, and welfare of the general public is in imminent danger, the Prehospital Medical Director may summarily suspend the medical control of the individual/service, notify OEMS of the circumstances and request immediate investigation. When dealing with a service, withdrawal of medical control authorization does not affect the service’s ability to provide the basic level of emergency care. In dealing with an individual, the service should re-assign the individual to work in a non-medical control capacity until the situation is resolved.

6. If the MIC technician and/or service fails to take the necessary actions(s) by the established date, medical control authorization will be suspended.

7. The MIC technician and/or service will be sent a letter informing them of the suspension.

**Immediate Withdrawal of Medical Control Authorization**

In the event of allegations of gross misconduct, gross negligence and/or serious deviations from established medical procedures and protocols, the Backus Hospital Prehospital Medical Director may, in the interest of patient care, public health or safety, withdraw medical control authorization from any Backus sponsored individual or service.

1. The issue in question is deemed to be a threat to the public health and safety.

2. All information concerning the issue is submitted in writing to the EMS Coordinator. Based on a review of this information and in consultation with the Backus Hospital Prehospital Medical Director, the decision is made whether to pursue a formal investigation.

3. The EMS Coordinator will gather other information as deemed necessary to conduct the investigation (i.e. CMED transcripts, statements from witnesses, etc.)

4. Notification of the formal investigation will be made to the individuals involved. The individual and/or service shall be notified of the facts, the time and place of a meeting to discuss the incident. Participants shall include the technician(s) involved, the EMS Service Chief or representative, the Backus hospital Prehospital Medical Director, the EMS Coordinator, and any other directly involved parties.

   At the meeting, the problem is described and the individual and/or service is given the opportunity to respond. The MIC technician and/or service may bring any documentation or other persons to corroborate his/her/their findings regarding the incident. This conference will take place at the discretion of the Backus Hospital Prehospital Medical Director within a reasonable period of time following the incident.

5. A written report of the findings will be completed following the conference. The report will indicate one of the following:

   a. The Prehospital Medical Director accepts the individual’s and/or service’s explanation of the circumstances and the matter is considered closed. This may include recommendations to avoid similar incidents in the future, but no further disciplinary action is necessary.

   b. The Prehospital Medical Director finds the explanation of the circumstances to be unacceptable and the individual and/or service will be advised of the measure to be taken to correct the identified problem. If the individual and/or service agrees with the measures to be taken, the
following items will be documented: fact that the meeting was held as well as the date, time, place and those present; the agreed upon measures; and time frame for compliance.

c. If no mutual agreement can be reached, and if the problem is such that the safety, health, and welfare of the general public is in imminent danger, the Prehospital Medical Director may summarily suspend the medical control of the individual/service, notify OEMS of the circumstances, and request an immediate investigation. When dealing with a service, withdrawal of medical control authorization does not affect the service’s ability to provide the basic level of emergency care. In dealing with an individual, the service should re-assign the individual to work in a non-medical control capacity until the situation is resolved.

6. The EMS Service Chief will submit a report to the Prehospital Medical Director to indicate that the necessary corrective actions may have been taken.

7. Any individual or service who fails to attend the conference risks the suspension or loss of medical control authorization.

Grievance Procedure

1. Should disciplinary action be taken against a MIC technician and/or service, the technician or service may request, in writing, a conference with the EMS Coordinator, the Backus Hospital Prehospital Medical Director, and the Director of Emergency Services to discuss the disciplinary action(s).

2. The MIC technician and/or service may bring documentation or other persons to corroborate his/her findings regarding the incident(s) or problem(s) resulting in disciplinary action(s).

3. It should be understood that the Backus Hospital Prehospital Medical Director makes all final decisions regarding Mobile Intensive Care sponsored by Backus Hospital.