Medical Standard Operating Guidelines
(Released May 2016)

Authorization

These guidelines and treatment guidelines were developed and reviewed under the authorization of the below-signed Medical Director in accordance with Florida Statute 401 and Chapter 64J-1 of the Florida Administrative Code. Changes to these guidelines can only be made with the authorization of the Medical Director and Century Ambulance Service, Inc.

Signature on File

David Murray, M.D.
Medical Director

These Medical Standard Operating Guidelines (MSOG) as reviewed and signed above by Century Ambulance Service, Inc.’s Medical Director supersede all previous memos, Emergency Medical Services Standard Operating Guidelines, Medical Standard Operating Guidelines, and Drug Listings.
# Table of Contents (200.00)

Authorization........................................................................................................................................1
Table of Contents (200.00) .................................................................................................................2
Introduction (200.02) .......................................................................................................................8
Reporting and Treating Patient Abuse / Neglect (205.00) ..............................................................9
Clinical Quality Assurance Program Purpose and Overview (205.02) ........................................10
Transport and Destination Determination (204.00) ........................................................................12
Medical Attendant Policy (204.01) ..................................................................................................15
Medical Radio Reports (204.02) ......................................................................................................16
Scope of Practice (203.00) ..............................................................................................................17
  Emergency Medical Technician (EMT) .........................................................................................17
  Paramedic (PMD) .......................................................................................................................18
Consent to Treat and Competency (210.00) ....................................................................................19
General Treatment Considerations (210.02) ..................................................................................24
  Arrive on Scene Prepared ...........................................................................................................24
  Medical Necessity .......................................................................................................................24
  Vital Signs ...................................................................................................................................25
  Bariatric Patients .......................................................................................................................25
  Ambulating Patients ..................................................................................................................26
  Transport the Correct Patient ....................................................................................................26
  Multiple Patient Transports .......................................................................................................26
  Patient Transfer Considerations ...............................................................................................27
  Positioning ...................................................................................................................................28
  Transfer of Care ..........................................................................................................................28
Behavioral Emergencies and Restraints (210.04) ........................................................................29
Violent / Combative Patient Management (210.06) .....................................................................31
Cooperation With Law Enforcement (210.08) ...............................................................................33
Do Not Resuscitate and Allow Natural Death Orders (210.10) ....................................................38
  Do Not Resuscitate Orders ..........................................................................................................38
  Florida Administrative Code 64J-2.018 regarding DNRO’s .....................................................38
  Allow Natural Death Orders .....................................................................................................38
  Revocation of a DNRO / AND (Century applies the same criteria to DNRO’s and AND’s) ......38
Dead on Scene (210.12) ..................................................................................................................39
Common Acronyms and Assessment References (210.14) .........................................................41
AVPU ...........................................................................................................41
DCAP-BTLS .................................................................................................41
OPQRST ..........................................................................................................41
SAMPLE .........................................................................................................41
Adult Glasgow Coma Score ..........................................................................42
Pediatric Glasgow Coma Scale ....................................................................43
Rule of Nines ...............................................................................................44
EMT Assessment / Treatments (210.16) .......................................................45
Airway Guidelines (215.00) .........................................................................46
Airway Treatments / Adjuncts .......................................................................48
  • Facilitated Intubation (Orotracheal Intubation) .......................................52
EMT Airway Algorithm ................................................................................54
Paramedic Airway Algorithm ......................................................................55
Post Intubation Management Algorithm .....................................................56
Failed Airway Algorithm ............................................................................57
Ventilator Guidelines ..................................................................................58
BiPAP Guidelines ........................................................................................64
NG / OG Insertion (215.02) ........................................................................68
Respiratory Insufficiency (215.04) ...............................................................70
Hyperventilation (215.06) ...........................................................................72
Needle Thoracentesis (215.08) ...................................................................73
Respiratory Arrest / Failure (215.10) ............................................................74
Drowning / Near-drowning Submersion (215.12) .........................................76
Vascular Access (220.00) .............................................................................78
Fluid Challenge (220.02) ..........................................................................82
Pain Management (225.00) ........................................................................85
Nausea / Vomiting (230.00) .......................................................................88
Abdominal / Flank Pain (230.02) .................................................................89
Diabetic Emergencies (230.04) ..................................................................91
Coma / Altered Consciousness (230.06) .......................................................92
Seizures (230.08) .......................................................................................95
Allergic Reaction / Anaphylaxis (230.10) .....................................................97
Hypotension / Shock / Medical (230.12) .....................................................99
Hyperthermia (230.14) .............................................................................100

Century Ambulance Service, Inc. • Medical Standard Operating Guidelines
Head trauma. Assume cervical spine injury in all patients with significant head trauma. If the head trauma patient is presenting with shock, look elsewhere for the cause.
168
169
173
175
178
179
181
183
185
187
189
192
193
194
196
197
199
202
204
207
209
210
211
212
213
214
215
216
219
220
221
223
224
229
230
Carbamate ........................................................................................................... 231
Carbon Monoxide ............................................................................................... 232
Chlorine ................................................................................................................ 235
Cyanide .................................................................................................................. 236
Hydrofluoric Acid ................................................................................................. 237
Hydrogen Sulfide .................................................................................................. 239
Nitrites / Nitrates .................................................................................................. 241
Phenol ...................................................................................................................... 243
Category A Infectious Pathogens / Agents Protocol (270.00) ................................. 245
Donning Personal Protective Equipment Procedures (PPE) ................................... 248
Unit / Equipment Decontamination Procedures .................................................... 249
Doffing Personal Protective Equipment Procedures (PPE) ...................................... 249
Biohazardous Waste Isolation and Disposal Procedures ....................................... 251
Ebola Specific Protocols ....................................................................................... 252
Ebola Recognition Algorithm ................................................................................ 254
Authorized Pharmaceutical Reference (290.00) ...................................................... 255
General Medication Policies .................................................................................. 255
  Drug Shortage Policy .......................................................................................... 255
  Self-Medication Policy ....................................................................................... 255
  Facility Initiated / Ordered Medications ............................................................... 255
Adenosine (Adenocard) .......................................................................................... 256
Albuterol (Proventil) ............................................................................................. 258
Aspirin [acetylsalicylic acid] (ASA) ...................................................................... 260
Atropine Sulfate ..................................................................................................... 261
Atrovent (ipratropium bromide) ............................................................................ 264
Benadryl (diphenhydramine) ................................................................................. 265
Dextrose (D50W, D25W, D10W, paste / gel) .......................................................... 267
Dopamine (Intropin) .............................................................................................. 269
Epinephrine ............................................................................................................ 271
Etomidate (Amidate) ............................................................................................ 274
Fentanyl (Sublimaze) ............................................................................................ 276
Labetalol (Normodyne) ....................................................................................... 278
Lasix (Furosemide) ............................................................................................... 280
Lidocaine (Xylocaine) .......................................................................................... 282
Magnesium Sulfate 50% Solution ....................................................................... 285
Morphine Sulfate........................................................................................................................................287
Narcan (Naloxone).....................................................................................................................................289
Nitroglycerin (Nitro Stat, Nitro Lingual, Nitro Paste) .............................................................................291
Promethazine (Phenergan) .....................................................................................................................293
Propofol....................................................................................................................................................295
Sodium Bicarbonate ..................................................................................................................................297
Tetracaine (Pontocaine) ............................................................................................................................299
Thiamine (B1)............................................................................................................................................301
Tissue Plasminogen Activator (TPA) .........................................................................................................302
Valium (diazepam).....................................................................................................................................305
Versed (midazolam).................................................................................................................................308
Zofran (ondansetron)...............................................................................................................................310
Glossary (295.00).....................................................................................................................................311
**Introduction (200.02)**  
(Page I of 1)

**Purpose**  
All guidelines contained within this document are intended to provide and ensure uniform treatment for patients who receive care from Century Ambulance Service, Inc. (Century) crewmembers.

**Scope**  
These guidelines apply exclusively to Century crewmembers operating in the out-of-hospital setting that provide care and transport to patients. Attempts have been made to cover all patients who access our system; however, the Medical Director realizes that unforeseen scenarios or situations may arise where treatment may require reasoned deviation from these guidelines. Such deviations will be reviewed on a case by case basis for inclusion in future revisions of these MSOG. In instances not specifically covered by these MSOG the crews should exercise good judgment and contact medical direction as necessary in order to provide the most appropriate care based on the patient’s situation and condition.

**Medical Direction**  
Providing high quality emergency medical services is the responsibility of all Century Ambulance employees and administrators. State law requires that all EMTs and paramedics function under the direction of a Medical Director (401.265 F.S. and 64J-1.004 F.A.C.). The Medical Director functions autonomously as administrator of clinical care and medical ethics for Century employees who work under his medical license. When medical direction is required the crew should contact the shift / field commander on duty first, and they will refer to the medical director if necessary.

**Other online medical direction.**  
In some cases a crew may find themselves in need of medical consultation while on a call. In these cases it is acceptable to request medical direction from the sending facility (if still on scene) or the destination facility. Always document and notify shift / field command when medical direction is obtained. **PCR documentation should detail the orders, applicable dosage, parameters and the ordering physician’s name.**

**Standard of Care**  
It is the philosophy of Century that the patient’s well-being must be our primary concern. This is accomplished by practicing the highest standard of care as defined by current medical science and treatment guidelines, as well as federal, state and local laws.

The standard of care is dynamic, changing and improving along with technology, science and understanding. It is not possible to produce a written document that addresses every potential clinical situation that could arise or one that is perpetually up-to-date. It is therefore necessary for Century crews to continuously update their own knowledge and rely upon their own clinical judgment in situations that fall outside of these written guidelines. Compassion for the patient, tempered by intellectual honesty and medical competence, should direct Century crews when applying these guidelines to patient care. Crewmembers are not to initiate treatments outside their scope of practice as defined by these guidelines without documented permission from Century’s Medical Director or other online medical direction as described above.
Reporting and Treating Patient Abuse / Neglect (205.00)

(1 of 1)

Reporting
Florida Statutes (F.S.), chapter 39 and 415, mandate that any person who knows, or has reasonable cause to suspect, that anyone who, because of age or disability, are in need of protective services is abused, neglected, or abandoned by a parent, legal custodian, caregiver, or other person responsible for the child's welfare shall immediately report such knowledge or suspicion to the Florida Abuse Hotline of the Department of Children and Families.

As an EMT, Paramedic, or other healthcare professional, all Century crewmembers are bound by law and these protocols to report any suspicion of abuse, ongoing or otherwise, as follows (The steps in bold are state mandated):

1. If unable to remove all suspected abused parties from the situation call law enforcement and follow their instructions. (Do not wait for their arrival if doing so will endanger the life of the patient or the crew.)
2. Document suspicions thoroughly including the specific facts leading to the suspicion.
3. Immediately notify the shift / field commander.
4. Prior to completing the PCR notify Century’s dispatch center (dispatch) of the suspicion and ask that the PCR be tagged for further review.
5. As soon as able, request a printed copy of the PCR and report it to the state.
   - **By Telephone:** 1-800-96ABUSE (1-800-962-2873)
   - **By Fax:** 1-800-914-0004
   - **Web Reporting:** [https://reportabuse.dcf.state.fl.us/](https://reportabuse.dcf.state.fl.us/)

When reporting suspicions of abuse the following information will be needed:
- Name, DOB (or approximate age), race, and gender of all involved.
- Addresses of all subjects including their last known location

**Note:** Any employee who intentionally makes a false report, fails to report, prevents another employee from reporting, or discloses confidential information relating to a suspected abuse case may be charged with a second-degree misdemeanor as provided by the above referenced Florida Statutes. Furthermore, failure to comply with these protocols is considered gross misconduct contrary to everything Century Ambulance Service stands for.

Treatment
Treatment of suspected abuse patient should follow normal treatment guidelines and include the following additional considerations:
- Remove the patient from the proximity of the abusers as soon as possible; (eg. Load the patient into the unit without the abusers.)
- Take care in treating and speaking to the patient / abuser(s);
  - **Do NOT disclose suspicions to ANY caretaker regardless of suspicions**
- Notify law enforcement if treatment is refused by the abusers;
  - Remain on scene or in area until law enforcement arrives
- Transport regardless of medical necessity
Clinical Quality Assurance Program Purpose and Overview (205.02)
(Page 1 of 2)

Purpose
Century’s clinical QA program provides a non-punitive process to ensure that Century employees are prepared to provide, and do provide, only the highest level of care in all patient interactions. This is accomplished through a six step clinical QA process which includes continuing education, application, review, two way feedback and re-education. This clinical QA program overview is not meant to serve as a full detailing of the process, but only provides general information. For a full step-by-step description of Century’s QA programs please refer to the Crew SOG.

Continuing Education
Century Ambulance provides ongoing training, on site and online, to its employees to ensure they are up to date and equipped to meet the needs of their patients and react to any unpredictable changes in their patient’s status. Some examples of these include:
- Online continuing education
- Onsite classes
  - ACLS
  - BLS
  - Critical care
  - PALS
  - PHTLS
  - Skills reviews (EMT / PMD)
  - Standard EVOC
  - Specialized EVOC
  - Vent / Bipap classes

Application
Utilizing the skills attained throughout their careers, via training prior to employment and Century’s continuing education process, our employees incorporate that knowledge into their treatment plans as they provide patient care in the field. Each patient interaction is completed and then documented in the patient care report (PCR).

Review
Based on the severity of the call and other predetermined factors reviewed and approved by the medical director certain calls are then reviewed by a critical care certified supervisor and / or the medical director. The PCR is reviewed from a clinical perspective to assess the competency level and professionalism in which the crew provided care. The purpose of the review is to ensure the crew provided optimal patient care that meets Century Ambulance’s standard of care or if the crew might need counseling or additional training.
Feedback
In Century’s clinical QA process the feedback portion consists of a three way communication stream.

First, the reviewer communicates with the crew regarding the level of care they provided and any advice/counseling that they feel is warranted. If no deficits in care are noted the crew is often given positive feedback. Often, the reviewer might ask the crew to clarify their decision making process or some other aspect of the situation to help them understand the situation better before making any decisions regarding the level of care provided.

Second, the crew responds to the reviewer with any additional information they might have regarding the reasoning behind their decision making process or the situation in general. They also are encouraged to ask any other questions they might have regarding the reviewer’s feedback. Finally, the crew also answers any clarifying questions the reviewer might have asked in their initial feedback.

Third, once communication between the reviewer and the crew draws to a close the reviewer has the option to contact the Clinical QA Committee and/or the training director to refer to them any issues which they do not feel will be able to be resolved without further intervention. In this case the clinical QA program enters the re-education step.

Re-education
During this step the crew, if deemed necessary based on the preceding steps, undergoes a custom one-on-one retraining/refresher series designed by the training department for that specific crewmember. During this step the crew receives the additional retraining and then is monitored for a period of time to ensure that the issue has been resolved. The clinical QA committee and training department reserves the right to request termination is it becomes apparent the issue cannot be resolved.

Clinical QA Program Summary
As stated above, the clinical QA program is not designed to be punitive in nature. It is designed to facilitate open and honest communication between crews and the medical director, their supervisors and the training department in order to help them remain up-to-date with current technology, treatments and standards of care available to the EMS profession. The program is also designed to act as a venue for crews and supervisors alike to discover and take advantage of opportunities for improvement via peer review and subsequent open and honest feedback.
Transportation to an appropriate facility is the final step in assuring the continuity of patient care. Patient care and well-being must be the overriding consideration in every case and should ultimately drive the determination of destination facilities and transport priorities and levels except as detailed in the Consent to Treat and Competency (210.00) and Cooperation With Law Enforcement (210.08) guidelines.

All patients will be transported based on the patient assessment in the most appropriate manner consistent with their condition. Deviations must be documented on the PCR.

Transportation and destination decisions are determined by uniform guidelines from the following specific guidelines and free from the influence of ability to pay, social status, convenience of attendants, or other discriminatory factors.

In situations where extraordinary circumstances exist, such as multiple casualty incidents (MCI) or other environmental situations, the Incident Commander may elect to deviate from existing guidelines in determining the destination of patients based on their company’s MCI guidelines which must be followed by Century crewmembers in regards to choosing the destination facility.

Generally Century responds to facilities, at the facilities request, for a transport. In all of these cases transport must be completed as requested unless one of the following criteria is met:

- Patient is competent and qualified to refuse transport and does so
  - The shift / field commander must be contacted prior to acceptance of refusal for coordination with facility staff

  OR

- If an incompetent patient’s parent, guardian, or healthcare surrogate refuses transport (A documented signed refusal of treatment / transportation is required.)
  - The shift / field commander must be contacted prior to acceptance of refusal for coordination with facility staff

- The ordering facility changes their mind
- Patient is deemed violent and a threat to their own or the responders safety
  - Shift / field commander must be consulted prior to refusal of transport
- Crew is notified of a higher priority patient by dispatch or the ordering facility
  - Crew must coordinate with dispatch if notified of a higher priority patient by the facility
  - Another unit will be dispatched to pick up the lower priority patient.

Transport Requirements are detailed on the following pages.
Transport Requirements
The following situations require transport to the ED when responding or coming upon a scene of an incident:

- Life-threatening emergencies and those situations which could become life-threatening
- Chest or abdominal pain in the adult patient
- Dyspnea
- Patients who meet Trauma, ST Elevated Myocardial Infarction (STEMI) or Stroke Alert status
- Patients who require or have received Advanced Life Support treatment and/or medications (e.g., O2, Nebulizer treatment, Nitroglycerin, Dextrose, etc.)
- Conditions that might be exacerbated by improper handling or inappropriate transport
- Pregnancy
- All near-drownings
- Pediatric patients 15 years of age or younger who are symptomatic
  - Exceptions are superficial injuries (Injury involving the skin surface and the subcutaneous layers) when a competent guardian or care giver is on-scene. (A documented signed refusal of treatment / transportation is required.)
- Elderly patients 65 years of age or older
  - Exceptions are non-symptomatic competent patients without a documented chief complaint. (A documented signed refusal of treatment / transportation is required.)

Non-Transport Requirements
The following situations will not require transportation of the patient to the hospital from a non-facility by a unit, however, the situation must be documented and must be approved by shift/field command prior to non-transport determination and call termination:

- Injuries of a superficial or minor nature after shift/field commander consultation
- Situations where transport would endanger the safety of Century crewmembers
  - These situations must be immediately communicated to the field/shift commander who will determine if authorities should be called (e.g. police, fire/rescue, etc.)
- Situations where patient refuses transport or requests other provider or private vehicle transportation
  - Follow Consent to Treat and Competency Guidelines (210.00).
- DOS victims will not normally be transported. Exceptions may include:
  - Police request body removed from scene (not to be transported to ED, but to ME/Morgue after consult with law enforcement and shift/field commander)
  - Body is placed in unit due to scene circumstances (not to be returned to previous location but transported to ME/Morgue after consult with law enforcement and shift/field commander)
- If Hospice was not the requestor of the transport and the patient is a Hospice patient the family should be encouraged to contact their Hospice counselor for instructions in patient disposition prior to transport. (Remain on scene for the result of consultation.)
Destination Determination
The lead crewmember will determine the transport destination after considering the following:

- Ordering facility destination requests should be honored unless a situation meets one of the other criteria listed below and shift / field command is consulted.
- Patients who are stable will be transported to the hospital where the patient is usually seen and which has the patient’s medical records.
- Patients who have life threatening conditions or are unstable that may become life threatening en route will be transported the closest most appropriate hospital.
- Patients who meet “STEMI Alert” status should be transported to a facility with interventional cardiac catheterization capability.
- Patients who meet Stroke Alert status will be transported to a State of Florida approved Primary or Comprehensive Stroke Center.
- Patients who meet “Trauma Alert” status will be transported in accordance with Trauma Transport Guidelines (245.00).
- Pediatric patients should be transported to the closest appropriate emergency department.
  - If a pediatric ED is within a reasonable distance diversion to that facility is appropriate.
- In addition to the above, a hospital's ability to provide specialized care, if known, should also be considered in choosing the closest most appropriate facility.

Note: A patient’s ability to pay for care must not affect destination decision.

Patients transported by unit will be transported to the emergency department (ED) with the following exceptions:

- Inter-facility transfers, are to be taken directly to the appropriate department / room.
- Repetitive transports will be taken to the appropriate facility for their appointment.
- STEMI Alerts may be taken directly to the cardiac catheterization lab when accompanied by an RN, PA or Physician.
- Upon consultation with the ED they request the patient be taken to another location.

Once on hospital’s property, the patient will not be removed from the property without consultation with the field / shift commander.

Continuation of Care
In order to ensure that our patients are never left in a situation where they have no way to care for themselves and no one available to care for them, Century requires that under no condition is a patient to be left unattended during a transport. Leaving the side of a patient during transport can be deemed abandonment and is against everything that Century stands for. Furthermore, no patient is to be left under their own care unless they are able to care for themselves and the situation has been cleared with shift command prior to the crew leaving.
Medical Attendant Policy (204.01)
(Page 1 of 1)

Every transport must have the appropriate attendant riding in the back with every patient.

- For an ALS transport, a paramedic must attend the patient.
- For a BLS transport, a Paramedic or emergency medical technician (EMT) must attend the patient.
  - If the BLS transport is on an ALS unit, follow the policy listed below concerning attendant on an ALS unit
- For a NMS transport, any level of personnel is permitted ride in the back on a NMT unit. If NMS transport is on an ALS or BLS unit, follow the policies listed above under number 1 and 2.

The medical director has determined what type of BLS patient may be attended by an EMT on an ALS license unit as follows.

For an EMT to attend a BLS patient the following conditions must be met:

- The patient is being discharged or transported to or from a treatment facility other than an acute care hospital or free-standing ED
- The onscene paramedic has conducted a primary patient ALS assessment and determined the patient’s condition and needs (current and potential) are within the EMT’s scope of practice as outlined in the Scope of Practice (203.00) section of these SOG’s. (requires no and will not reasonably require any ALS interventions)
- This ALS assessment is documented on the electronic patient care record (ePCR) and identifies the paramedic who conducted the assessment.
- The paramedic signs an EMT authorization form on the ePCR

If a nurse, doctor or any other medical personnel are riding with the patient, the paramedic must also ride in the back with the patient even if they are not to providing patient care. This includes but is not limited to NICU, PICU, airport and helipad transports.

The attendant will make the decision whether to transport more than one (1) patient from a stable medical facility environment. This decision should be made by considering the patient’s condition. If one patient is being treated for a cardiac or respiratory condition and/or is unstable (whether medical or psychiatric) no other patients should accompany him/her. Patients of the opposite gender should not be transported together. This does not apply to a scene call or mass casualty incident (MCI). For extenuating circumstances, contact the field / shift commander.

In order to ensure that patient always receive the highest level of care, the attendant will sit on the bench seat while attending a patient (as opposed to the captain's chair). This protocol applies for the duration of the transport and ensures the attendant is in the best position when assessing and monitoring the patient. In the event that the patient's care and needs would be better served from the captain's chair the attendant must include their reasoning in their ePCR.
**Verbal Reports to Destination Facilities**

Medical radio reports are required for all transports going to an ER or equivalent facility (e.g. trauma center). The report should relay all pertinent information regarding the patient, treatment and other pertinent information and take no longer than 45 seconds. The following is a basic outline of such a report:

- **Hailing**
  - Announce your company unit number and the facility name
  - Wait for response

- **Actual Report**
  - Company and vehicle identification (again)
  - Patient's age, sex, and chief complaint
  - Brief history of the present illness; (e.g., past medical history, medications and allergies only if relevant to the chief complaint)
  - Vital signs (e.g., pulse, respiratory rate, blood pressure, pulse oximetry, BGL, cardiac rhythm and any other pertinent readings)
  - General pertinent physical and mental status including level of consciousness
  - Pertinent care provided
  - Ask if facility has any further questions or orders
  - Provide estimated time of arrival (ETA)

An example of such a report would be:

1. **Hailing** - “Century 23 calling Baptist Medical ER”

2. **Facility Response** - “Go ahead Century 23”

3. **Actual Report** - “This is Century 23 en route to your location with a 57 year old female with a chief complaint of upper abdominal wounds. Patient was stabbed in the abdomen with a steak knife multiple times during an altercation approximately 20 minutes ago. Pt has a medical history of an MI and is on Coumadin. Her signs are as follows: pulse 120, respirations 24, blood pressure 116 / 75, pulse-ox is 95%., and she has a pain scale of 10. Patient is AOX4 but anxious. Her abdomen is rigid with 4 stab wounds visible. Patient has normal saline running and has a large bore IV established. We will be there in about 10 minutes. Do you have any questions or orders?

Note the lack of extraneous information not related to the immediate needs of the patient. For example, the fact that the patient is allergic to penicillin is not mentioned. This is because it will not affect the treatment of the patient prior to their arrival or at the emergency department (ED) before you give your full report.

*Note: AOX4 was used in this example because, as with all trauma situations (such as stabbings), the event must be included in the mental assessment. AOX3 is acceptable for medical situations.*
Emergency Medical Technician (EMT)

An EMT is an individual trained in basic emergency medical procedures and certified by the Florida Department of Health, Bureau of EMS as such to perform these procedures in all medical emergency situations.

Treatment responsibilities include:

- Providing safe transportation at all times to ensure the safety of themselves, their partner(s), their patients, and the community at large.
- Be familiar with and follow the instructions found in 64J-1 F.A.C. as they relate to the duties of an EMT.
- Ensuring proper body substance isolation (BSI) precautions. (see Crew SOG)
- Ensuring scene safety- Each crewmember must independently survey the scene to ensure the safety of themselves, their partner(s), bystanders, and the patient.
- Determining the mechanism of injury (MOI) and / or nature of illness (NOI) as applicable and formulating and performing a treatment plan accordingly.
- Following these Medical SOG’s in treatment of patients, except those items under paramedic purview.
  - Examples of treatments under a paramedic’s purview include:
    - Endotracheal intubation
    - Needle thoracentesis
    - IV or IO access and therapy
    - Defibrillation (Exception: AED)
    - Drug therapy
      - EMT’s can initiate administration of oxygen and dextrose gel / paste
      - EMT’s can continue administration of crystalloid solutions initiated PTA by facility employees
    - ECG interpretation
    - NG or feeding tube placement
  - Performing patient care techniques such as cardiopulmonary resuscitation (CPR), splinting, obstetrical assistance, bandaging, administration of oxygen, administration of a subcutaneous injection using a premeasured auto-injector of epinephrine belonging to the patient who is suffering an anaphylactic reaction, and other techniques described in the Emergency Medical Technician Basic Training Course Curriculum of the United States Department of Transportation.
  - Providing care to minimize secondary injury and provide comfort to the patient and family while transporting the patient.
  - Assisting the paramedic in an ALS unit in their treatment by performing such duties as handling and preparing equipment during an ALS procedure.
  - Providing thorough and professional documentation of all calls according to Century Ambulance’s Crew SOG and all other policies pertaining to documentation.

The Paramedic (PMD) scope of practice is detailed on the following page.
**Scope of Practice (203.00)**

(Page 2 of 2)

**Paramedic (PMD)**
A paramedic has all the training of an EMT, additional training in Advanced Life Support (ALS) procedures and certified by the Florida Department of Health, Bureau of EMS (BoEMS) to perform these procedures in all medical emergency situations.

Treatment responsibilities include:
- Providing safe transportation at all times to ensure the safety of themselves, their partner(s), their patients, and the community at large.
- Be familiar with and follow the instructions found in 64J-1 F.A.C. as they relate to the duties of a Paramedic.
- Ensuring proper body substance isolation (BSI) precautions. (See Crew SOG)
- Ensuring scene safety- Each crewmember must independently survey the scene to ensure the safety of themselves, their partner(s), bystanders, and the patient.
- Determining the mechanism of injury (MOI) and / or nature of illness (NOI) as applicable and formulating a treatment plan accordingly.
- Follow the individual treatment guidelines, including those items under EMT and Paramedic.
- Performing patient care techniques as described under EMT responsibilities as well as advance life support treatments such as endotracheal intubation, the administration of drugs or intravenous fluids, telemetry, cardiac monitoring, ventilator / BiPAP support, and cardiac defibrillation, pursuant to these MSOG.
- Providing care to minimize secondary injury and provide comfort to the patient and family while transporting the patient.
- Providing thorough and professional documentation of all calls according to Century Ambulance’s Crew SOG and all other policies relating to documentation.
Consent to Treat
The EMT or Paramedic must have consent to render care to any patient. There are several forms of consent accepted under current state statutes which are detailed in the following guidelines.

Informed consent. Patients must meet the following other requirements to give informed consent.

Age and emancipation status. The patient must meet the following age or emancipation requirements.
- At least 18 years of age.
- Be emancipated (e.g., less than 18 and married or legally released from control of parent or guardian)
- Exceptions
  - An unmarried pregnant minor may give consent for medical treatments related to her pregnancy
  - An unmarried minor mother may give consent for her child

In the case of children or adults under the care of a parent or legal guardian, informed consent must be obtained from the parent or legal guardian except as outlined above.

A patient is gives informed consent when any of the following occur:
- Patient gives verbal permission to treat
- Patient gives written permission to treat
- Patient does not object as you begin assessment

Mental competence. In order to give informed consent a patient must be mentally competent. This means the patient must be
- awake, alert, and fully oriented to person, place, time and situation;
- have no significant mental impairment (e.g., alcohol, drugs, head injury or significant illness);
- and not exhibit suicidal or homicidal ideations and does not want to hurt themselves.

Consent for treating minors. Under Florida Statute 743.064 (as of November 2000) consent for treating minors is guided by the following conditions:
- If medical personnel are concerned for the safety of a minor and the legal guardian as defined below refuses transport:
  - For assistance with convincing a guardian, contact the shift commander / field commander
  - Crews should request law enforcement for assistance when having difficulty transporting the patient due to the guardian or lack thereof or when there are potential threats to life or limb (patient, crew, etc.).
Consent to Treat Continued

Consent for treating minors continued. Any of the following persons in order of priority listed may consent to the medical care or treatment of a minor who is not committed to the Department of Children and Family Services (DCF) or the Department of Juvenile Justice (DoJJ) or in their custody when, after a reasonable attempt, a person who has the power to consent as otherwise provided by law cannot be contacted by the treatment provider and actual notice to the contrary has not been given to the provider by that person:

- A person who possesses a power of attorney to provide medical consent for the minor
- The stepparent of the minor
- The grandparent of the minor
- An adult brother or sister of the minor
- An adult aunt or uncle of the minor

The DCF or DoJJ caseworker, juvenile probation officer, or person primarily responsible for the case management of the child, the administrator of any facility licensed by the department or the administrator of any state operated or state contracted delinquency residential treatment facility may consent to the medical care or treatment of any minor committed to it or in its custody when the person who has the power to consent as otherwise provided by law cannot be contacted and such person has not expressly objected to such consent. There shall be maintained in the records of the minor documentation that a reasonable attempt was made to contact the person who has the power to consent as otherwise provided by the law.

Implied consent. Examination, treatment, and transportation may be initiated by an EMT or paramedic, without informed consent from a patient, under the authority of FS 401.445, if all three of the following conditions are met:

- The patient is intoxicated, under the influence of drugs or otherwise incapable of providing informed consent
- The patient is experiencing an emergency medical condition and unable to give consent
- The competent patient would normally give consent

Examination and treatment shall be limited to the reasonable examination, treatment and transportation necessary to stabilize the medical condition and unreasonable force shall not be used. During the examination, treatment and transportation the EMT or PMD should continue to attempt to obtain consent from the patient through continued explanation of their condition.

In cases where informed consent cannot be obtained, crewmembers may still provide emergency care if the criteria for implied consent are met. These cases include when:

- Immediate lifesaving care is indicated
- The patient is unconscious and / or unable to give informed consent
- The patient is a child or adults under the care of a parent or legal guardian and parent or legal guardian is not available
Consent to Treat Continued
Baker & Myers Act. A “Baker Acted” patient has been involuntarily been placed under a civil commitment for mental health examination and treatment when a person appears to have a mental illness, present a danger to self or others and refuses voluntary exam or is unable to understand the need for the examination.

A patient under a Myers Act, or Marchman Act, involuntary civil commitment must have displayed cause to believe, based on good faith reasoning, the person is substance abuse impaired and because of the impairment they have lost self-control over substance abuse, and one of the following is true:

- Has inflicted, or attempted to inflict, physical harm on self or others.
- Is in need of substance abuse services and, by reason of substance abuse impairment reason of substance abuse impairment, his or her judgment has been so impaired that the person is incapable of appreciating his or her need for such services and of making a rational decision in regard thereto; however, mere refusal to receive such services does not constitute evidence of lack of judgment with respect to his or her need for such services.

Note: Substance abuse impaired means a condition involving the use of alcoholic beverages or any psychoactive or mood-altering substance (illegal drugs or misuse of medications or other substances) in such a manner as to induce mental, emotional, or physical problems and cause socially dysfunctional behavior.

Century crewmembers are not legally authorized to involuntarily civilly commit persons under these acts. Law enforcement officers, mental health professionals and physicians, or circuit courts are the only avenues for the Baker Act and Myers Act to be initiated; however, a guardian can also apply for a minor’s involuntary admission.

If a Century crewmember feels that involuntary commitment under any of these acts is warranted, law enforcement should be contacted. Baker Act and / or Myers Act shall not be used as a pretext to providing medical treatment / transportation to an individual who refused treatment and does otherwise not meet the standards for implied consent under Fla. Stat. 401.445 as stated herein unless they are placed under such acts by the above mentioned professionals prior to treatment.

However, if a person has been or is being civilly committed pursuant to a lawful Baker Act or Myers Act and they separately meet the requirements for implied consent for medical care, this should be documented and handled in accordance with the procedures for treating / transporting persons who have not consented to the same.

Note: Being civilly committed under a Baker Act or Myers Act does NOT preclude the patient from signing the HIPAA / Assignment of benefits portion of the patient care report (PCR) and crewmembers must try to obtain this signature unless they are also psychotic or confused.
Consent to Treat Continued

**Special Considerations.** A person may not be denied needed pre-hospital treatment or transport for an emergency medical condition. If any circumstance prohibits the EMT or paramedic from giving needed emergency service (denial of care for a child or elderly person, combative patient, etc.) It must be thoroughly documented in the PCR and the shift commander or field commander must be immediately notified prior to termination of the call.

**Refusal of Treatment**
A mentally competent adult patient may legally withhold consent to be assessed, treated, and/or transported at any time during Century’s interaction with them. When this happens it must be thoroughly documented in the patient care report. The patient must also sign the appropriate refusal statement on the PCR (The refusal signatures are located under the Outcome tab in the Signature section.) If the patient refuses to sign, have a witness to the refusal sign the refusal form. If no one is available to witness the refusal the shift commander or field commander must be notified and the refusal must be documented in the PCR prior to the termination of the call.

Unless the patient refuses the following must be completed when a patient refuses treatment:

- Obtain and record
  - Follow the EMT Assessment / Treatment Protocol (210.04)
  - At least one set of vital signs for each patient
- Any improvement or change from initial complaint (e.g., improved BGL)
- Perform a physical examination
- Record that patient is awake & oriented to person, place, time and events
  - Assess for any trauma or medical illness that may represent a threat to well-being of the patient or alter their ability to make decisions (e.g., hypoxia, hypoglycemia, prior stroke, etc.) and document findings
  - Assess for competency and psychiatric illness (e.g., suicidal / homicidal behavior, hallucinations, delusions, etc.) and document findings
  - Assess for the presence of a toxic ingestion or exposure (e.g., alcohol, drugs, medications such as narcotics or benzodiazepines or CO) and document findings

**Note:** If the patient refuses physical assessment then document that in the narrative section of the patient care report and document any findings that you are able to observe.

If the patient is not competent to refuse transport and refuses transport do the following:

- Explain to patient (or parent / legal guardian), the need for transport;
- Reassure patient that no harm will result from transport but complications, up to and including death, may result from a delay in treatment;
- If the patient (or parent / legal guardian) continues to refuse care and satisfies the implied consent standard of Fla. Stat. 401.445 as restated herein:
  - Enlist the aid of law enforcement personnel for patient and crew safety
  - Proceed with transport of the patient
Consent to Treat and Competency (210.00)
(Page 5 of 5)

Refusal of Treatment Continued
If the patient (or parent / legal guardian) is competent to refuse transport, emphasize the following:

- The need for treatment / transportation
- The risks of refusal of care (including death and disability)
- The willingness of Century to transport the patient
- If the patient (or parent / legal guardian) continues to refuse care do the following:
  - The patient should call 911 back if there are any changes in their condition

Document the following in the PCR for ALL cases in which there is a refusal of care:

- An assessment of competency
- All refusal precautionary language as outlined above
- The name of the person legally able to refuse and actively refusing assessment, treatment and / or transport
- Signature of person refusing in the appropriate refusal signature field
  - No one else may sign for a legally competent adult patient (e.g., spouses, relatives and friends, etc.)
    - Exception: Healthcare Power of Attorney with patient’s verbal consent
- If patient refuses to sign write “Refused to Sign” in the signature field and in the narrative
- Print name and signature of competent witness
  - The documented refusal is only valid with an appropriate witness signature
  - Appropriate witnesses (in order of preference) are spouses, relatives, law enforcement, friends, and other fire / rescue personnel
  - The Paramedic or EMT documenting and executing the refusal may NOT sign as a witness
Arrive on Scene Prepared
Each crew should ensure that all potentially necessary medical equipment should be with them when they arrive at the patient’s bedside. Examples of medical equipment to be considered include, but are not limited to:

- IV pump
- Ventilator
- Jump bag
- Etc..

At no time should a patient’s infusions be clamped at bedside and then restarted once in the unit. **Regardless of the infusion, the pump is to be brought into the facility and the infusion started using Century equipment prior to departing.**

If, upon reaching the patient's bedside, it is discovered the patient is on an infusion and the crew does not have the pump with them a crewmember must immediately return to the unit and return with the IV pump **prior** to disconnecting the patient from the facility pump. (This applies to all Century equipment situations.)

**Note:** If dispatch does not advise of IV equipment, this does not always mean there is no fluid or medication being infused. Common sense and good judgment should be exercised when determining what equipment to bring into the facility.

Medical Necessity
Century employees are expected and trained to be able recognize medical necessity when completing transports. The term medical necessity revolves around the question “What medical intervention or monitoring does the patient require or might require during transport and why?”

The ability to answer this question is important for a variety of reasons, but the primary reason is that the patient’s treatment plan is built on the answer.

Answering that question forces the crew to assess the patient appropriately and clinically, recognize current and potential issues that need to be addressed immediately or prepared for and apply those issues in creating their patient’s treatment plan.

In short, if a crew is able to recognize medical necessity they will be prepared and able to provide the patient with the highest standard of care available and thus ensure them the highest probability of a positive outcome.
Vital Signs
Each transported patient will have their vitals taken a minimum of two times or once every 15 minutes, whichever is greater. Critical patients will have their vitals taken at least once per five (5) minutes.

Bariatric Patients
Century Ambulance Service specialized in the transport and care of bariatric patients. It is important for crews to understand the challenges posed to both the crews and patient in these types of transport, both physical and mental.

Some common challenges present in these transport include:

- **Positioning**
  - Stretcher stability (do not fully elevate stretcher when rolling it)
  - Respiratory effort (patient may need to sit in a specific position to decrease work of breathing)
  - Room in unit (Mount may need to be adjusted to center position)
  - Width of stretcher (wide stretcher may be required or rails may need angled if using an expandable patient surface (XPS) model)
- **Lifting**
  - Always use proper lifting techniques when lifting any patient
  - Stretcher may need manual assistance when using the hydraulic system
  - Request additional resources if necessary
  - Ensure stability of stretcher when moving and lifting
- **Mental Health**
  - Bariatric patients often struggle with depression and a negative self-image. They are often reluctant and embarrassed to be moved or assisted due to their size and the complications their size bring.
    - Always be pleasant, polite, non-judgmental, and supportive in every aspect of your patient interaction
    - Preserve their privacy (shut the room door or shield from public view as able)
- **Other health factors**
  - Bariatric patients often have multiple health problems associated with their weight that may not be tied to their current chief complaint.
    - Always assess, monitor and treat these patients with this in mind.

While all of Century’s units are capable of handling bariatric patients, Century does operate multiple units that are designed to specialize in bariatric transport and carry specialized equipment. (e.g. winch and ramp system) All crewmembers should be familiar with these units and their associated equipment. Whenever possible these units will be dispatched on calls involving a bariatric patient, and, in some cases, that may involve a crew swapping units.

*More general treatment considerations can be found on the following pages.*
Ambulating Patients
Century’s policy and reasoning in regards to allowing a patient to stand and ambulate is based on current healthcare industry standards and designed ensure patient and crew safety when transferring a patient to or from the stretcher.

It is not uncommon for patients to overestimate their capabilities during a medical situation or after a hospital stay. Patients also do not typically know the effects of medications on their bodies and ability to ambulate.

Based on the above risk factors and based on the fact that a patient falling can pose a risk to the physical health of both the patient and the crew (back and other injuries resulting from trying to catch and manage the falling patient) patients are not to ambulate to the stretcher. Rather, the patient should be sheeted or assisted in standing and pivoting to the stretcher placed at bedside.

In cases where the above is not feasible due to extenuating circumstances, the crew is to transfer the patient to the stretcher via the most appropriate means available and notate the extenuating circumstances and all actions taken to ensure the safety and well-being of the patient and crew during the transfer.

In all cases the health of the patient must be protected, and this protocol serves to ensure the safe transfer of the patient in all situations.

Transport the Correct Patient
When picking up a patient, the crew must always ensure they are picking up the correct patient. To accomplish this, the crew must visualize the patient’s name on their wrist band, AND on their paperwork AND communicate with the staff to confirm the patient is indeed supposed to go.

Important note: Do NOT take a patient’s word that you are to transport them. Due to some patient’s being confused or under a Baker Act they might give you bad information.

Note: Treatment and / or transport of the wrong patient is considered gross misconduct.

Multiple Patient Transports
Many times, under normal operations Century crews are faced with the situation of transporting more than one patient to the hospital via one unit. (e.g. two male BLS patients going from LCMC to UF Health Gainesville) In this situation, neither patient shall be left unattended in the back of the rescue unit, under any circumstance.

If a crew is transporting a maximum of two patients, under normal circumstances, to the hospital via one unit the Lead crewmember should request additional resources / crews to ride along in order to assist in patient care and monitoring until they can be taken into the emergency room.

Under emergency situations that are being handled as a MCI or other disaster this policy may be altered as needed by the pre-staging officer (generally a field / shift commander).
Patient Transfer Considerations
Century Ambulance Service, Inc. primarily does non-emergency transports. Many of these transports involve patients who have had, or are about to have a procedure completed with the previous few days or have been in the hospital, or other facility, for an extended period of time.

While it is easy to assume that these patients merely require a ride to their destination, it is important to remember that these patients often have restrictions to movement and positioning as well as medication, pain and re-injury considerations. *Ask the nurse about any precautions.*

In order to ensure our pre / post procedure patients receive appropriate care it is important to be aware of the following patient transfer considerations and tips:

**Ambulation.**
- See [Ambulating Patients Guidelines](#)

**Medications**
- Find out when patient last received pain medication
  - If it is time for patient to receive another dose, request it
    - Due to controlled substance laws and regulations the patient may not receive pain medication for many hours after arriving at their destination
- The same applies to sedation medications or any other medication whose effects might wear off during or within a few hours of transport

**Preparation.**
- Place the stretcher at a slightly lower elevation than the bed (1 - 2 in)
  - This will prevent the patient from catching on the stretcher mattress as they are moved
- Whenever possible always slide the patient away from their incision site. (e.g. hip surgery)
  - This reduces the stress on the sutures, staples, etc
- Make sure that all tubes, wires, etc. are clear of the patient and have enough “slack” to allow for the transfer
- Tell the patient exactly what will be done, what to expect and how they can help
  - If it will likely hurt, tell them so they are prepared

**The transfer.**
- Ask for assistance from facility staff if pain is a consideration and the procedure involved the pelvic region or lower extremities
- If pain is a consideration when sheeting a patient have them blow forcefully as though blowing up a balloon as they are transferred
  - This acts as a distraction and focus point for the patient and helps reduce pain perception during transfer
- Make sure communication between crewmembers, facility staff, and the patient is clear and projected.
- Transfers should be smooth from start to stop without interruptions, if at all possible

---
Positioning
One of the most powerful yet undervalued tools in the EMS handbag of treatment options is positioning. A trained and competent medical professional knows how to utilize strategic positioning to improve patient outcomes and health status in any number of situations. By understanding the etiology of the patient’s chief complaint and underlying conditions the EMT and paramedic are uniquely equipped to use positioning as a stabilizing and/or preventative intervention.

A list of just some of the situations in which positioning can improve the patient’s condition utilizing clinical understanding and judgment include, but is not limited to:

- Pain
- Fractures (extremities and spinal protections)
- Respiratory distress / shortness of breath
- Decubitus ulcers
- Post-surgery transfer and transport
- Airway management
- Aspiration precautions
- Hemiparesis (stability on the stretcher)
- Abdominal Aortic Aneurysm (AAA) *imminent dissection

Transfer of Care
When transferring patient care over to the receiving facility / caretaker it is imperative that crews ensure that the care is transferred to the appropriate individual.

In cases where the destination facility is a hospital, skilled nursing facility (SNF), dialysis center, or any other high level facility the transfer of care assignee must be an LPN at a minimum.

In cases where the destination facility is a mental health facility or an assisted living facility (ALF) the transfer must be to a person who is able and qualified to meet the needs of the patient. (e.g. security at a mental health facility)

In the event that the patient is being taken to their residence or an ALF transfer of care must NOT be to the patient themselves. Patient care must always be to their caretaker or other individual who takes care of their needs. **In the event a patient is transferred to their residence and no one is available to sign for patient care the on-duty shift / field commander must be contacted and the results of that conversation must be thoroughly documented in the patient care report (PCR) narrative as closing comments.**
Behavioral Emergencies and Restraints (210.04)
(Page 1 of 2)

Physical restraint use is permitted only when absolutely necessary on patients who are at immediate risk for harming themselves or others because of impaired judgment due to any of the following:

- Drugs and / or alcohol
- Psychiatric illness
- Head injury
- Metabolic causes (CNS infection, hypoglycemia, etc.)
- Dementia

Approved methods of restraints for use by Century employees are as follows:

- Soft limb restraints
- Stretcher straps / harness
- Wide cloth restraints

The use of physical or improvised restraints on patients is only permitted for the time it takes to retrieve and apply the above approved methods of restraint. Century crews are not authorized to place a patient in hard plastic ties (temporary or riot handcuffs) or any form of restraint requiring a key to remove.

A law enforcement officer must accompany the patient in the ambulance to the hospital as per the policies outlined in the Cooperation With Law Enforcement Guidelines (210.08) if the patient must remain in restraints not authorized for use by Century employees.

In all cases, whether applied by law enforcement, Century crews, or other authorized professional, the restraints must provide the patient sufficient flexibility to straighten their abdomen and chest to allow the patient to take full breaths and not impede their ventilations.

In all cases where a patient is restrained and assessed, treated and / or transported the use of restraints must be documented thoroughly in the PCR including assessment of the following:

- Position of the patient. (No patient will be transported in a prone or “hog-tied” position.)
  - Positioning must not preclude evaluation of the patient’s medical status or injure the patient in any way
- Status of circulation distal to restraints
- Completion of frequent assessments of patient’s position and medical status.
  - Circulation should be evaluated at least every ten minutes.
Excited Delirium

The term “excited delirium” was first used to describe the acute behavioral changes associated with the abuse of stimulant drugs, like methamphetamine, PCP, and cocaine. It has since become a more widely used phrase, often used interchangeably with “agitated delirium”, to describe any individual who is demonstrating a specific constellation of physical signs.

Risks. These individuals are at an increased risk for sudden death, with case reports clustered in the summer months and in areas noted for high temperature or high humidity. Additionally, obesity may increase the risk for sudden death in these individuals.

An individual acting in a violent, erratic, or bizarre manner usually attracts the attention of the police, and soon thereafter, EMS. A struggle often ensues and after being restrained, the individuals may suddenly die, bringing the actions of the police and Century crews into question.

Identifying excited delirium. While the exact causes of these deaths are unknown, the relationship with police custody and / or rescue transport is well documented. Therefore, it is imperative that crews recognize those individuals at risk and be prepared to respond to the “excited delirium” emergency.

Physical signs of excited delirium include

- unfounded fear and panic;
- shouting / nonsensical speech;
- bizarre behavior (hallucinations / paranoia);
- hyperactivity and thrashing about (especially after restraint);
- unexplained strength / endurance;
- shedding clothes / nudity (due to increased body temperature);
- and / or profuse diaphoresis.

Century crews must maintain a constant vigilance of this patient’s condition

A previously combative patient who becomes suddenly quiet should raise a red-flag

Excited delirium can mimic several medical conditions including hypoxia, hypoglycemia, stroke, or intracranial bleeding. All of these patients should be transported as per these MSOG.
Century Ambulance crewmembers routinely encounter patients who are violent, combative or agitated due to behavioral illness or a medical condition. Crews are not required to enter into situations which pose a threat of physical harm to them and should consider leaving the scene until it is secured by law enforcement.

On rare occasions, crewmembers may be required to take actions to protect themselves or others prior to the arrival of law enforcement.

Agitation is defined as a distress or uneasiness of the mind that is caused by fear of danger or a state of apprehension and psychic tension from a mental disorder. Two of the most common causes of patient agitation are pain and shortness of breath. Paramedics should not medicate the psychiatric patient unless there is a threat of harm to themselves or others.

**Signs and Symptoms**

**Mild.**
- Hyper-alert
- Insomnia
- Irritable, easily annoyed
- Mildly upset
- Short tempered

**Moderate.**
- Difficulty concentrating
- Easily distracted
- Expresses a desire to harm themselves or others (Baker Act patient)
- Expresses a feeling of worry
- Increased irritability
- Nausea
- Restless
- Tachycardia
- Tachypnea
- Tearful
- Visibly upset

**Severe.**
- Crying uncontrollably
- Dilated pupils
- Disconnected state; unable to follow simple directions
- Expresses feeling of terror
- Greatly agitated
- Hyperventilation
- Irrational behavior
- Physically combative
- Self-soothing behavior
Violent / Combative Patient Management (210.06)

(Page 2 of 2)

Treatment

Emergency Medical Technician.
- Follow Behavioral Emergencies and restraints Guidelines (210.04)
- Ensure law enforcement is en route or present
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2, if possible
- Make every attempt not to aggravate or worsen the situation

Paramedic.
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Determine BGL by finger stick, if not previously obtained
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Follow Pain Management Guideline, if indicated
- For patients exhibiting severe symptoms ONLY
  - Versed 2 to 5 mg IV / IM
    - OR
  - Valium 2 to 5 mg IV / IM
  - Document the patient’s behavior, actions and statements which indicated the need for medication in the Tablet PCR, and notify shift command.
Cooperation With Law Enforcement (210.08)
(Page 1 of 5)

Crewmember Responsibilities When Law Enforcement is Present
Century Ambulance employees are to cooperate with law enforcement to the fullest extent possible while ensuring the safety of themselves, their partner(s) and the public. Employees are responsible for the welfare of the patient(s) in their care and all medical treatment at the scene of an emergency. Law enforcement is responsible for traffic control and general scene management.

After assessment and treatment, but prior to transport or upon termination of care crews must advise law enforcement of the patient’s medical condition and any applicable hospital destination.

Note: Law enforcement have final authority / accountability regarding patients in their charge.

Patients Under Arrest
Medical and trauma patients will be treated and transported according to guidelines unless otherwise directed by law enforcement. The destination of the patient will be per police request, however, if the patient’s condition merits a deviation from that destination crewmembers may request a change in destination but the law enforcement officer’s decision will be final and must be documented in the PCR after consultation with shift / field command regarding any deviation from Century guidelines. If no destination has been requested when the call was initiated the arresting / attending law enforcement officer should be asked to designate the receiving hospital according to their guidelines. When transporting patients who are handcuffed, a law enforcement officer with a handcuff key should accompany the patient inside the unit. Do not transport the patient restrained in the prone or “hog-tied” position.

TASER® Deployment Management
Assessment.
- Obtain information from the police regarding what happened prior to the deployment of the TASER® to the individual
  - It is important to consider any report of extreme, irrational behavior prior to the tasing as significant, regardless of the patient’s current presentation
- Complete a physical examination and history
  - This should include a basic neurological examination, skin signs, pupil assessment, a complete set of vital signs and examination for traumatic injuries. Chest pain, shortness of breath, vomiting, incontinence and headache should be treated as high index of suspicion warranting further assessment.
- Pay close attention to patients with a cardiac history, including coronary artery disease, myocardial infarction and congestive heart failure
  - Although the TASER® current does not pose a direct threat to conductivity of the heart, the strain of a prolonged physical conflict with police could precipitate a cardiac event
- Consider factors that are indicators of a risk of sudden unexpected death syndrome
  - The vast majority of individuals who have died in police custody have shown signs of mania or delirium, due to a number of different causes. Patients, who have been tased and displayed such factors by history, should be considered at risk, even if no longer displaying those factors.
TASER® Deployment Management  Continued  

Removal of TASER® Probes. 
- Remove TASER® probes if still in the patient  
- To remove the probe, grab it firmly and pull back in a quick fashion, using the other hand as a counter pressure. 
  - *Probes should be given to the police after removal*  
- When not to remove TASER® probes  
  - If the TASER® probes are implanted in sensitive areas (e.g., face, throat, eye, groin, breast, hands and feet) leave them in place. Treat as an impaled object and transport patient to the hospital.  
  - When in doubt on how to remove the TASER® probes  
  - *Treat as an impaled object and transport patient to the hospital*  

Patient Transport. 
Patients who have been tased should be transported to the hospital under the following circumstances: 
- History of delirium, mania, or irrational bizarre behavior before being tased  
- Persistent abnormal vital signs  
- History or physical findings consistent with amphetamine or hallucinogenic drug use  
- Cardiac history  
- Altered level of consciousness or aggressive, violent behavior including resistance to evaluation  
- Evidence of hyperthermia  
- Abnormal subjective complaints, including chest pain, shortness of breath, nausea or headaches  
- Probes in sensitive areas as described above  
- In doubt on how to remove the probe  

Transportation should be consistent with guidelines for transporting patients in police custody  

Evidentiary Blood Draw Requests  
In accordance with two state statutes (Ch. 316.1932(2)(c), F.S. and Ch. 316.1933(1)(a), F.S.), paramedics may initiate evidentiary blood draw procedures at the request of law enforcement officials, if the patient has been involved in an accident resulting in serious bodily injury or death. In these cases, the law enforcement officer has the authority to use reasonable force to obtain the blood sample from the patient.  

*Note: If the patient has not been involved in an accident resulting in serious bodily injury or death, the patient has the right to refuse to have the blood sample obtained*  

_Evidentiary blood draw requests procedures are detailed on the following pages._
Cooperation with Law Enforcement (210.08)
(Page 3 of 5)

Evidentiary Blood Draw Requests Continued

Blood draw on a patient being transported by Century. The following process shall be followed for blood draw requests on patients being transported by CAS units:

- Initiate medical care as per the appropriate protocol
- Determine if you can safely (without jeopardizing patient care) draw the blood and convey the answer to the officer requesting the draw
- Obtain blood draw kit from the requesting officer
- Draw blood per procedure (see Evidentiary blood draw request procedures below.)
- Complete the appropriate sections of paperwork enclosed with the blood draw kit which pertain to EMS as directed by law enforcement officer
- Document the following in the PCR.
  - Date on the kit
  - Officer’s name and badge number
  - Details on how the blood was drawn

Blood draw on patients who refuse treatment / transport. The following process shall be followed for blood draw requests on patients who refuse treatment and / or transport:

- Follow the Consent to Treat and Competency Guideline (210.00)
  - If not mentally competent, enlist law enforcement to aid transport
  - If mentally competent, completely advise patient of possible complications (with witness present) and advise patient they will have to sign refusal
- Obtain blood draw kit from the requesting officer
- Draw blood per procedure (see Evidentiary blood draw request procedures below.)
- Have the patient sign a refusal, if warranted, and have the same officer witness the refusal
- Complete the appropriate sections of paperwork enclosed with the blood draw kit which pertain to EMS as directed by law enforcement officer
- Document the following in the PCR.
  - Date on the kit
  - Officer’s name and badge number
  - Details on how the blood was drawn

The general procedure when performing an evidentiary blood draw is detailed on the following pages.
Procedure for Evidentiary Blood Draw

1. Open needle cartridge. Twist to break the tamper-evident seal. Remove cap, exposing the back portion of the needle and threaded hub. Do not remove front needle cover.

![Image of needle cartridge](image1)

2. Assemble needle to holder. Thread needle into holder until firmly seated.

![Image of needle in holder](image2)

3. Insert VACUTAINER tube into holder. Push straight onto needle, no further than the guidelines on the holder.

![Image of tube inserted](image3)

4. Apply tourniquet, prepare venipuncture site using only the non-alcoholic antiseptic pad provided in this kit. Position the arm in a downward position.

![Image of tourniquet](image4)

5. Remove needle cover; perform venipuncture in the usual manner, keeping the stopper of the tube in the upper-most position.

![Image of venipuncture](image5)
6. Push VACUTAINER tube forward to end of holder, piercing the rubber stopper. When blood flows into tube, remove tourniquet as soon as blood begins to fill tube. During this procedure, do not allow contents of vacutainer tube to contact stopper. Special attention shall be given to arm position, tube position in order to prevent possible backflow from the tube, and its attendant possibility of adverse reaction to the patient.

7. When the tube fill is complete and blood ceases to flow, remove the tube from the holder. Insert the second VACUTAINER tube straight into the holder until blood flows.

8. When sampling is completed immediately remove the needle / holder assembly: Apply and hold a dry sterile compress to the venipuncture site. Elevate the arm.

9. To assure proper mixing with anticoagulant powder, *slowly* invert the tubes at least five times immediately after blood collection. *Do not shake vigorously!*
Do Not Resuscitate and Allow Natural Death Orders (210.10)

(Page 1 of 1)

These guidelines serve as a guide for Century crews in making the decision to resuscitate or not. And apply to patients of all ages, including victims of SIDS. It cannot address all possible contingencies. The provider should, when in doubt, attempt resuscitation.

Do Not Resuscitate Orders
Century regularly transports terminally ill patients Do Not Resuscitate Orders (DNRO) and/or Allow Natural Death Orders (AND). It is important that these legal requests are followed to the letter and that all efforts are made to respect the patient / family’s wishes. Florida Statutes (F.S. 765.109) states that “A health care facility, provider, or other person who acts under the direction of a health care facility or provider is not subject to criminal prosecution or civil liability, and will not be deemed to have engaged in unprofessional conduct, as a result of carrying out a health care decision made in accordance with the provisions of this chapter.”

Florida Administrative Code 64J-2.018 regarding DNRO’s
(1) An emergency medical technician or paramedic shall withhold or withdraw cardiopulmonary resuscitation: (a) Upon the presentation of an original or a completed copy of DH Form 1896, Florida Do Not Resuscitate Order Form ... or (b) Upon the presentation or observation, on the patient, of a Do Not Resuscitate Order patient identification device.

With this statute in mind Century’s Medical Director has resolved that Century crews will accept the DH Form 1896, Florida Do Not Resuscitate Order Form if properly completed as follows:
- Signed by the competent patient (or the patient’s representative)
- Signed by a Florida licensed physician
- Be on either the original canary yellow form or copied onto a similar colored paper.

Allow Natural Death Orders
Century’s Medical Director has also resolved that Century crews will also honor all forms of AND’s if signed by the patient, or the patient’s health care surrogate, or proxy or court appointed guardian or person acting pursuant to a durable power of attorney just as they would a DNRO.

Always transport the DNRO and/or AND with the patient. If a facility refuses to allow the original form to be taken the crew must ask for a copy and present it to the receiving facility along with a verbal affirmation that the crew did personally view the original.

Note: Per 64j-2018 F.A.C., “During each transport, the EMS provider shall ensure that a copy of the DNRO form or the patient identification device accompanies the live patient. The EMS provider shall provide comforting, pain-relieving and any other medically indicated care, short of respiratory or cardiac resuscitation.” Crew will treat an AND patient the same.

Revocation of a DNRO / AND (Century applies the same criteria to DNRO’s and AND’s)
Per Florida Statutes 64j-2018 F.A.C., “A DNRO may be revoked at any time by the patient, if signed by the patient, or the patient’s health care surrogate, or proxy or court appointed guardian or person acting pursuant to a durable power of attorney ... the revocation may be in writing, by physical destruction, by failure to present it, or by orally expressing a contrary intent.”
Dead on Scene (210.12)
(Page 1 of 2)

Dead on Scene (DOS) / Unquestionable Death Criteria
Patients meeting *ALL* of the following criteria are considered DOS:

- Unresponsive
- Apneic
- Pulseless
- And the patient shall meet *at least one* of the following criteria:
  - Unknown time down or greater than 15 minutes down and cool to the touch.
  - Lividity (discoloration of dependent parts of the body due to gravitation of blood)
  - Clear signs of body decay or visible decomposition
  - Rigor mortis (rigidity)
  - Open cranium with exposed brain matter
  - Decapitated or a severed trunk
  - Multi-system trauma patient
  - Blunt chest trauma with no heart sounds or asystolic rhythm *confirmed in two leads*; or wide complex ventricular rhythm of 30 or less without a pulse

**Note:** It is appropriate to administer CPR to a child meeting these criteria if it is determined to be in the best interest of the guardian’s or guardians’ mental health based on their condition and the best judgment of the lead crewmember on scene. (*Sensitivity is required in either case.*)

Cessation of CPR
Once CPR is *initiated by Century personnel* it must be continued to the nearest appropriate ED and only discontinued if a physician makes the “call.”

Century’s MSOG does NOT allow for termination of resuscitation efforts once initiated with the following exceptions:

- A valid DNRO is found and presented after CPR is initiated
- CPR was initiated on a child or infant as described above for the guardian’s best interests
  - CPR can be discontinued in the unit if DOS criteria were met prior to initiation in the unit and out of sight of the aforementioned guardian
- CPR is *initiated by non-Century personnel* and the paramedic on scene determines that DOS criteria above was originally met

The appropriate PCR disposition of “Dead at Scene” will be selected on all PCR’s and a thorough narrative referencing the assessment and confirmation of all of these criteria is required whenever the above criteria is met. (Even if no transport is completed.)

**DOS Scene Control**
Once a patient is declared DOS the following guidelines must be followed to ensure proper patient care, documentation and scene preservation:

- After pronouncing the patient or declaring DOS all interventions should be left in place.
  - It is appropriate to stop the flow of any medication
- Protect the patient’s dignity if it does not interfere with a suspected crime scene
**Dead on Scene (210.12)**

**(Page 2 of 2)**

**DOS Scene Control Continued**

As a general rule, law enforcement officers voluntarily defer to the EMS provider for resuscitation decisions. However, ultimate responsibility for control of death scenes rests with law enforcement. If a law enforcement officer denies access to a scene, they are, in fact, determining the patient to be DOS themselves according to their own department guidelines. In the event that law enforcement elects to make this determination themselves the following must be obtained and documented:

- The law enforcement officer’s name
- The law enforcement officer’s badge number
- That the officer has assumed total responsibility for the pronouncement of death and that they have denied you access to the scene.
- The officer must then sign the PCR’s Refusal of Assessment, Treatment and Transport signature field

When a Century crewmember has determined a patient to be DOS the following steps should be taken to control the scene:

- If law enforcement is not present, they should be notified as soon as possible
- The scene should not be vacated until law enforcement arrives unless death occurred at a facility and the death is not suspicious
- Once law enforcement is on-scene the crew must answer any questions they may have and assist with scene control as requested and able
  - Officer’s name and badge number must be documented

**Suspected crime scene.** If a scene is a crime scene, suspected or otherwise, the following guidelines must be followed to help preserve evidence:

- Avoid disturbing the patient's position or location at the scene as much as possible.
- Avoid disturbing the scene as much as possible.
  - Only Century communication devices should be used
  - Medication (or other) containers should not be moved or touched
  - With the exception of Century supplies and equipment, nothing should be moved or touched. (except where absolutely necessary for scene safety and / or patient access.)
    - Once moved, items should NOT be returned to its original position
- Once DOS has been called and law enforcement has arrived the crew should exit the scene and do not reenter
- Civilians should not be allowed to enter the scene unless directed to by law enforcement
- The position of anything relevant to the body (such as sheets, weapons, etc.) and the position of the body should be observed and documented. Make notes on an paper field report (for law enforcement) about these as soon as possible, with notations of anything that was disturbed.
  - Document everything as accurately as possible and turn in to the officer on scene
- Do not leave the scene until law enforcement assumes control and the crew is dismissed
**Common Acronyms and Assessment References (210.14)**

**Page (1 of 4)**

**AVPU**
- Alert
- Verbal
- Painful Stimuli
- Unresponsive

**DCAP-BTLS**
- Deformities
- Contusions
- Abrasions
- Punctures and Penetrations
- Burns
- Tenderness
- Lacerations
- Swelling / Edema

- Diarrhea
- Urination
- Miosis
- Bronchospasm
- Bradycardia
- Bronchorrhea
- Emesis
- Lacrimation
- Salivation

**OPQRST**
- Onset
- Provocation
- Quality
- Region
- Severity
- Time since onset

**SAMPLE**
- Signs / Symptoms
- Allergies
- Medications
- Past medical history
- Last oral intake
- Events leading up to present illness / injury
### Adult Glasgow Coma Score

<table>
<thead>
<tr>
<th>RESPONSE</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Opening</strong></td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>4</td>
</tr>
<tr>
<td>To Speech</td>
<td>3</td>
</tr>
<tr>
<td>To Pain</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td><strong>Best Verbal Response</strong></td>
<td></td>
</tr>
<tr>
<td>Oriented</td>
<td>5</td>
</tr>
<tr>
<td>Confused</td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate words</td>
<td>3</td>
</tr>
<tr>
<td>Incomprehensible sounds</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td><strong>Best Motor Response</strong></td>
<td></td>
</tr>
<tr>
<td>Obeys</td>
<td>6</td>
</tr>
<tr>
<td>Localizes</td>
<td>5</td>
</tr>
<tr>
<td>Withdraws</td>
<td>4</td>
</tr>
<tr>
<td>Abnormal flexion</td>
<td>3</td>
</tr>
<tr>
<td>Abnormal extension</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Score</strong></td>
<td>3-15</td>
</tr>
</tbody>
</table>

*The Pediatric Glasgow Coma Scale and Total Burn Surface Area (TBSA) Rule of Nines is shown on the following pages.*
# Pediatric Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Response</th>
<th>Adolescent</th>
<th>Child</th>
<th>Infant / Neonate</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Opening</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>Spontaneous</td>
<td>Spontaneous</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>To Speech</td>
<td>To speech</td>
<td>To speech</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>To Pain</td>
<td>To pain</td>
<td>To pain</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Best Verbal Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oriented</td>
<td>Oriented, appropriate</td>
<td>Coos and babbles</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Confused</td>
<td>Confused</td>
<td>Irritable, cries</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate words</td>
<td>Inappropriate words</td>
<td>Cries in response to pain</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Incomprehensible sounds</td>
<td>Incomprehensible words or nonspecific sounds</td>
<td>Moans in response to pain</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Best Motor Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obeys</td>
<td>Obeys commands</td>
<td>Moves spontaneously and purposely</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Localizes</td>
<td>Localizes painful stimulus</td>
<td>Withdraws in response to touch</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Withdraws</td>
<td>Withdraws in response to pain</td>
<td>Withdraws in response to pain</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Abnormal flexion</td>
<td>Flexion in response to pain</td>
<td>Decorticate posturing (abnormal flexion) in response to pain</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Extensor response</td>
<td>Extension in response to pain</td>
<td>Decerebrate posturing (abnormal extension) in response to pain</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Score</strong></td>
<td></td>
<td></td>
<td></td>
<td>3-15</td>
</tr>
</tbody>
</table>

*The Total Burn Surface Area (TBSA) Rule of Nines is shown on the following page.*
Common Acronyms and Assessment References (210.14)
Page (4 of 4)

Rule of Nines

Total Burn Surface Area (TBSA) Rule of Nines

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Adult</th>
<th>Pediatric</th>
<th>Infant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head and Neck</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td>4.5%</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Back</td>
<td>4.5%</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Trunk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>9%</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Lower</td>
<td>9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>9%</td>
<td>18%</td>
<td>13%</td>
</tr>
<tr>
<td>Lower</td>
<td>9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arms (EACH)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legs (EACH)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td>9%</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>Back</td>
<td>9%</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>Genitalia</td>
<td>1%</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>in Trunk</td>
<td></td>
</tr>
<tr>
<td>Buttocks</td>
<td></td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>in Trunk</td>
<td>5%</td>
</tr>
<tr>
<td>Total TBSA</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
EMT Assessment / Treatments (210.16)

The EMT is an integral part of pre-hospital patient care. The EMT is expected to perform assessments and treatments according to this guideline. (In the event the EMT is on an ALS unit they should follow the lead paramedic’s orders within their scope of practice.)

All Patients Require
- A.B.C.’s
  - BLS / AED, if indicated
- Assess level of consciousness / responsiveness
  - A.V.P.U
  - Glasgow Coma Score (GCS)
- Head-to-toe or focused physical exam as indicated
- History of present illness / injury
  - SAMPLE and OPQRST
- O2 as indicated
- Record and monitor vital signs
  - Respiration (rate, quality and rhythm)
  - Pulse (rate, quality and rhythm) and skin conditions
  - Blood pressure
  - Pupillary conditions
  - Oxygen saturation (SpO₂)
  - Attach ECG electrodes, if applicable (4 Lead / 12 Lead)
  - Blood Glucose Level (BGL)
- Place the patient at rest by calming and reassuring

Additionally Trauma Patients Require
- Assess for Trauma Alert Criteria and issue as indicated
- Hemorrhage control as indicated
- Follow Spinal Immobilization Guidelines (245.04) as indicated
- Splint as indicated
Assessment
- Onset (acute or gradual)
- Duration
- Exacerbating or alleviating factors
- Oral exposure / foreign bodies (e.g., toys, drugs, alcohol, food, chemicals, etc.)
- Trauma
- Environmental exposure
- Smoking
- Medical illnesses (e.g., COPD, asthma, diabetes, CHF, thrombophlebitis)
- Medical History
  - Medical illnesses (e.g., COPD, asthma, diabetes, CHF, thrombophlebitis)
  - Medications
  - Allergies
- Home O2
- Smoking, drug, or alcohol use

Signs and Symptoms
- Chest pain (location, quality, position)
- Dyspnea
- Cough
- Sputum production or change
- Paresthesia in hands or mouth
- Calf pain (Homans’ Sign)
  - An indication of incipient or established thrombosis in the leg veins in which slight pain occurs at the back of the knee or calf when, with the knee bent, the ankle is slowly and gently dorsiflexed.
- Fever
- Vital Signs
  - Vary
- Cardiovascular
  - Neck vein distention
  - Dysrhythmias
- HEENT
  - Upper airway or facial edema
  - Drooling
  - Nasal flaring
- Neurologic
  - Decreased level of consciousness
  - Agitation
  - Belligerent
  - Restlessness
  - Slurred speech
Signs and Symptoms Continued

- Respiratory
  - Stridor
  - Rales
  - Rhonchi
  - Wheezing
  - Decreased breath sounds
  - Crepitus
  - Accessory muscle usage

- Skin
  - Cyanosis
  - Peripheral edema (Abnormal buildup of fluid in the ankles, feet and legs)
  - Hives
  - Evidence of neck or chest trauma
  - Subcutaneous emphysema

**Note:** Management of the patient's airway is perhaps the most critical as well as the most basic of interventions practiced in emergency medicine. Proper airway management may be as simple as monitoring the patient’s efforts to breathe or as complex as invasive therapy. *Cervical spine considerations are integral to proper airway management and must be given appropriate attention when the mechanism of injury indicates possible spinal involvement.*

*Airway treatment guidelines and algorithms are found on the following pages.*
Airway Guidelines (215.00)
(Page 3 of 22)

Treatment
Airway Treatments / Adjuncts

Emergency Medical Technician.
- Oxygen Delivery Devices
  - Nasal Cannula (Low Flow)
    - Set flow meter to 2 to 6 lpm
  - Non-rebreather (High Flow)
    - Set flow meter to at least 10 lpm
      - Adjust liter flow to maintain O2 in the reservoir bag
  - Nebulizer (assembled by the EMT; medications administered by the paramedic)
    - Set flow meter to at least 6 lpm (typically 8 lpm)
      - Adjust liter flow to maintain a mist of the medication
    - Face Mask nebulizer
      - Patient who is not able to hold the T-piece or inadequate inspiratory effort
    - In-line ETT nebulizer
      - Intubated patients who present with bronchoconstriction
  - Bag Valve Mask Ventilation (BVM)
    - Consider using the two rescuer technique
    - Pull the jaw into the mask
      - Use the “E-C technique”
    - Supplemental O2 at 15 lpm
    - Squeeze the bag until the chest rises
      - Do not squeeze the bag too quickly
- Airway Adjuncts
  - Oral Pharyngeal Airway (OPA)
    - Consider use in the unconscious / unresponsive patient
    - Do not use in a patient with a gag reflex
    - Size device - measure the distance from the corner of the mouth to the tip of the ear lobe
    - Insertion
      - Insert with the tip toward the roof of the mouth
        - Do not push the tongue into the back of the throat
      - Once the device is half way into the mouth, rotate it 180 degrees
      - Continue advancing until the flange rests upon the lips
Airway Guidelines (215.00)
(Page 4 of 22)

Airway Treatments / Adjuncts Continued
Emergency Medical Technician continued.
- Airway Adjuncts continued
  - Nasal Pharyngeal Airway (NPA)
    - Consider use in semi-conscious, unconscious and / or unresponsive patients
    - Insertion
      - Size NPA (Measure from the tip of the nose to the angle of the jaw.)
      - Lubricate with KY jelly
      - Insert into the nostril bevel side toward the nasal septum of the nose
      - If resistance is encountered during insertion, continue to insert while gently twisting the NPA and lift it toward the forehead
      - Exercise extreme caution with neonates and small infants due to the risk of nasal obstruction
  - Combi-Tube
    - Indications
      - Cardiac, respiratory or traumatic arrest
    - Contraindications
      - Responsive or has a gag reflex
      - Age less than 16 years old
      - Foreign Body Airway Obstruction (FBAO)
      - Height less than 5 feet tall or greater than 7 feet tall
      - Ingested a caustic substance
      - Patient has esophageal disease (cancer, varices or tracheotomy)
    - Insertion
      - Inflate each cuff to ensure that they will hold air
        - Deflate completely prior to insertion
      - Lubricate distal tip with KY Jelly
      - Place head in the neutral position
      - Perform tongue-jaw lift
      - Insert combi-tube into the mouth
      - Continue insertion until teeth / gum line is between the black lines
      - Inflate Cuff #1 with 100 mL of air
      - Inflate Cuff # 2 with 15 mL of air
      - Attach BVM to tube 1 (blue tube) and ventilate
      - Confirm placement:
        - Auscultate the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs while ventilating the patient with the BVM
        - If epigastric gurgling is heard STOP ventilating
          - Switch BVM to tube 2 (clear tube), ventilate and confirm placement
      - May secure the combi-tube if deemed necessary
Airway Guidelines (215.00)
(Page 5 of 22)

Airway Treatments / Adjuncts Continued

Emergency Medical Technician continued.

- Airway Adjuncts continued
  - King Tube
    - Indications
      - Cardiac, respiratory or traumatic arrest
    - Contraindications
      - Patient has esophageal disease (cancer, varices or tracheotomy)
      - Ingested a caustic substance
      - Foreign Body Airway Obstruction (FBAO)
      - Responsive or has a gag reflex
    - Insertion
      - Choose the right size King tube for the patient
      - Remove from package
      - Inflate the cuff to ensure that it will hold air
        - Deflate completely prior to insertion
      - Lubricate distal tip with KY Jelly
      - Place head in the neutral position
      - Perform tongue-jaw lift
      - Insert the King tube sideways into the mouth, rotating as the tube clears the tongue
      - Continue insertion until the teeth/tooth/gum line is at the black line
      - Inflate cuff with the appropriate amount of air for the size King tube used
        - Inflation volumes are detailed on the packaging.
      - Attach BVM to tube and gently pull on the tube to seat it as you ventilate
      - Confirm placement
        - Auscultate the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs while ventilating the patient with the BVM
        - If an epigastric gurgling sound is heard STOP ventilating
          - Switch BVM to tube 2 (clear tube), ventilate and confirm placement
  - Endotracheal Intubation
    - The EMT will assist the paramedic by securing and assembling equipment and assisting with any part of this skill. The EMT will be familiar with all of the equipment and components associated with endotracheal intubation.
Airway Guidelines (215.00)

Airway Treatments / Adjuncts Continued
 Paramedic.

- Intubation
  - Indications
    - Apnea
    - No gag reflex
    - Unconsciousness and / or unable to protect airway
    - Overdose
    - Severe respiratory insufficiency

- Nasotracheal Intubation
  - Indications
    - Spontaneously breathing patient without a gag reflex
  - Contraindications
    - Apneic patient
    - Massive facial injuries (e.g., upper teeth loose / broken, unstable facial bones)
    - Basilar skull fracture (e.g., raccoon eyes, Battle’s signs, CSF drainage)
  - Caution: PHTLS curriculum suggests that extreme caution should be exercised when attempting nasotracheal intubation in the presence of midface trauma or fractures. Advancing the tube in a superior direction rather than posterior and using significant force when resistance is encountered may lead to passage of the tube into the cranial vault with damage to the brain. **This intervention should only be done if there are no other airway options, and as a last resort.**
  - Insertion
    - Lubricate the nostril with Lidocaine jelly using a NPA or other method
      - Use sufficient amount to coat interior of nasal passage
    - Lubricate ET tube with KY jelly, **NOT Lidocaine jelly**
    - Pre-ventilate and pre-oxygenate the patient as required by patient condition
    - Remove NPA (if used)
    - Insert ET tube into nostril with bevel toward nasal septum
      - If resistance encountered gently twist while continuing insert, DO NOT FORCE
    - Once the ET tube is in the oral pharynx:
      - Have patient speak if possible to open vocal cords
      - Advance the ET tube through the vocal cords as the patient inhales
    - Inflate the distal cuff
    - Confirm placement
      - Auscultate the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs while ventilating the patient.
        - If an epigastric gurgling sound is heard STOP ventilating
    - Follow Post Intubation Management Algorithm (**Page 12 of these guidelines**.)
Airway Guidelines (215.00)
(Page 7 of 22)

Airway Treatments / Adjuncts Continued

Paramedic continued.

- Facilitated Intubation (Orotracheal Intubation)
  - Indications
    - Apnea
    - Impending airway collapse / compromise
    - Near death
    - SpO2 less than 90% with assisted ventilations or high-flow O2
    - Unresponsive / no gag reflex
  - Relative Contraindication
    - Obvious reversible medical conditions (e.g., hypoglycemia prior to D50W.)
  - Insertion
    - Oxygenate and ventilate
      - Use BVM or NRFM as appropriate
        If using BVM consider use of OPA / NPA
      - Prepare all equipment
      - Follow Paramedic Airway Algorithm
    - Sedate the conscious and hypoxic patient
      - Etomidate 0.3 mg / kg IV / IO
        - DO NOT stimulate the patient for 45 seconds if possible
        - If patient is not sedated within 2 to 5 min. repeat dose once
      - Versed if indicated
        - Adult 2 to 5 mg IV / IO
          - May use up to 0.3 mg / kg for patients who did not respond to Etomidate
          - High doses / rapid administration can cause hypotension
          - In elderly patient’s administer in 1 mg increments
            - Pediatric 0.1 to 0.2 mg / kg IV / IO to a max dose of 4 mg
      - Propofol (used for sedation only when the above are not available)
        - Adult 100-150 mcg / kg / min for 3-5 minutes followed by a maintenance infusion of 25-75 mcg / kg / min
      - Maintain sedation post intubation with additional doses of Versed or Propofol infusion as required (See specific treatment situations below for longer term sedation on the following page.)
    - Visualize trachea with direct laryngoscopy
    - Locate anatomical landmarks
    - Suction as required
    - Introduce (pass) the tip of the ET tube past the vocal cords into the trachea
    - Confirm placement
  - Continued on following page
Airway Guidelines (215.00)
(Page 8 of 22)

Airway Treatments / Adjuncts Continued
Paramedic continued.
- Facilitated Intubation (Orotracheal Intubation) Continued
  - Insertion continued
    - Use EtCO2 main stream capnography
    - Auscultate the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs while ventilating the patient with the BVM
      - If epigastric gurgling noted stop ventilating, deflate distal cuff and remove the ET tube
      - If breath sounds noted in lung fields and epigastrium is silent follow
        Post Intubation Management Algorithm

Note: If crew is working on a unit equipped with an HT70 ventilator / BiPAP the patient should be placed on the ventilator according to the Ventilator Guidelines Specific Treatment Situations and refer to long term sedation for longer transport guidelines shown below.

Specific treatment situations.
- Long term sedation for longer transports
  - Administer Propofol
    - Sedation dose
      - 0.1-0.15 mg / kg / min for 3-5 minutes followed by a maintenance infusion of 0.025-0.075 mg / kg / min
      - SICU Sedation in the intubated patient
      - 0.05 mg / kg / min for at least 5 minutes; may increase by 0.05-0.01 mg / kg / min every 5-10 minutes until desired level of sedation. Maintenance infusion is 0.005-0.05 mg / kg / min may be required. Max dose is 0.15 mg / kg / min (some may require a higher dose).
    - Note: PROPOFOL SHOULD NEVER BE DILUTED. Concentrations in both the 100mg and 20mg bottles are the same.
- Alternative oral tracheal intubation techniques (e.g. Two Person Intubation)
- Head trauma / Stroke
  - Lidocaine 1.5 mg / kg IV / IO prior to intubation to induce airway anesthesia and blunt the rise in ICP, BP and HR
- Pediatric
  - Atropine 0.02 mg / kg IV / IO (minimum single dose 0.1mg) prior to intubation to counteract vagal stimulation and bradycardia
Airway Guidelines (215.00)
(Page 9 of 22)

EMT Airway Algorithm

Needs Airway Assistance

Yes

Breathing?

IF INDICATED
Ventilate using BVM with 100% O₂

Consider appropriate airway adjuncts
(e.g., NPA, OPA, Supra-glottic Airway, Combi-tube)

Assess SpO₂

SPO2 < 90% SPO2 ≥ 90%

Administer O₂ according to specific protocol OR continue to ventilate with BVM, NPA / OPA with Sellick maneuver

Ventilate & oxygenate using BVM, NPA / OPA with Sellick maneuver Suction when appropriate Attempt to increase SpO₂ > 90%

No

Open Airway:
Head-Tilt / Chin Lift or Jaw thrust Maneuver Check for breathing

Give 2 ventilations

Patent Airway?

Yes No

Reposition head & attempt 2 ventilations

Patent Airway?

Yes No

Assume FBAO*:
Unconscious Adult / Child / Infant: perform CPR, look in mouth before ventilating and remove obstruction if observed

Conscious and NOT breathing
Assume FBAO*:
Conscious Adult / Child: abdominal thrusts until object is relieved

*SBAO = Foreign Body Airway

*FBAO = Foreign Body Airway
Paramedic Airway Algorithm

Needs Airway Assistance

- Inadequate ventilation
  - SPO2 < 90%
    - Administer O\(_2\) according to specific protocol
  - SPO2 ≥ 90%
    - Maintain SpO\(_2\) ≥ 90% with BVM?
      - Yes
        - Is Intubation Appropriate?
          - No
            - Follow EMT Airway Algorithm
          - Yes
            - Perform Facilitated Intubation (Orotracheal / Nasotracheal)
              - If necessary Etomidate (0.3 mg / kg IV / IO)
                - Successful?
                  - No
                    - BVM Utilize Sellick Maneuver for at least 2 minutes
                  - Yes
                    - Go to Post Intubation Management Algorithm
          - No
            - repeat intubation

- No gag reflex or apneic
  - Perform Facilitated Intubation (Orotracheal / Nasotracheal)
    - If necessary Etomidate (0.3 mg / kg IV / IO)
      - Successful?
        - No
          - Go to Failed Airway Algorithm
        - Yes
          - Go to Post Intubation Management Algorithm
          - Etomidate (0.3 mg / kg IV / IO) if not previously administered
            - Repeat Intubation
              - Successful?
                - No
                  - Go to Failed Airway Algorithm
                - Yes
                  - 3 attempts at intubation by experienced paramedic?
Post Intubation Management Algorithm

Placement of the tube confirmed after inflating the cuff
Use a minimum of 2 of the following: auscultation, chest rise and fall, end tidal CO₂ detector or main stream capnography

Secure the tube if appropriate
(May use tape for nasotracheal tubes)
(Note the ET tube depth before and after securing)

Use main stream End-tidal CO₂ device
(Note and record CO₂ readings and waveform)

Continuously reassess tube placement
*Especially after each patient movement*
(Use EtCO₂ readings / waveform / patient's condition)

A problem with the tube or ventilation?
(If so, troubleshoot)

**Trouble with the tube**
- D - Dislodged-re-intubate (return to paramedic algorithm)
- O - Obstructed- suction or re-intubate
- P - Pneumothorax- needle thoracostomy
- E - Equipment Failure- Check O₂; get a new BVM

**Trouble with ventilation**
- Check for pneumothorax
- Check for spontaneous breathing
- Sedate:
  - Versed 2-5 mg IV / IO may repeat once in 5 min, or
  - Valium 5-10 mg IV / IO

No
Continue to ventilate & oxygenate during transport
Suction when appropriate
Advise ED of airway status
Continuously reassess tube placement
(Use EtCO₂ readings / waveform / patient's condition)

Yes

If unit is equipped with an HT70 ventilator, place the patient on the vent according to the Ventilator Guidelines
Specific Treatment Situations on page 17 of these guidelines
Failed Airway Algorithm

Failed Airway Algorithm (UNABLE TO INTUBATE)

Able to ventilate & oxygenate using BMV, NPA / OPA with Sellick maneuver?

Yes

- If indicated insert Esophageal or Supra-glottic Airway (e.g., Combi-tube)

Successful?

Yes

- Continue to ventilate & oxygenate during transport
- Suction when appropriate
- Rapid transport for physician intervention
- Advise ED of airway status

No

- Rapid transport for physician intervention
- Advise ED of airway status

No

- Continue to ventilate & oxygenate during transport, suctioning when appropriate
- Rapid transport for physician intervention
- Advise ED of airway status
Ventilator Guidelines
Century uses the Newport™ HT70 Plus ventilator (HT70) for all transports requiring ventilator or BiPAP support en route.

Note: If the patient has their own ventilator or BiPAP it is appropriate to transport the patient on their own ventilator throughout transport.

Things to know.
The external battery will last approximately 10 hours, fully charged. The internal battery will last ~30 minutes, fully charged.
- If the internal battery is not fully charged the unit will not power up

Preparation.
- Each morning the station captain should test and confirm the ventilator is functional and has the necessary equipment in the ventilator bag
  - If the ventilator is kept on a unit, the crew should also check the ventilator as part of their daily check off
- When assigned a ventilator call, units without a permanently assigned ventilator will retrieve one from the nearest available station
  - Don’t forget the ventilator tray table
- Upon assignment of a ventilator run the crew should assess their unit and stretcher’s O2 levels to ensure they have enough available for the call
  - If they do not they should refill their O2 tanks while getting the ventilator from the nearest available station
- En route to the call the paramedic should ride in the back of the ambulance and test the equipment to be sure it is fully functional
  - See setup instructions below
  - If the Device Alert light is on, the HT-70 has a critical failure and cannot be used

Specific guidelines for ventilator and BiPAP support is given on the following pages.
Ventilator Guidelines Continued

Modes.
- **Assist Control (A / CMV):** Every ventilation is delivered to the patient by the ventilator at preset intervals. (The patient is totally dependent on the ventilator.)
- **Synchronized Intermittent Mechanical Ventilation (SIMV):** The patient can trigger a breath, but if they do not one is still delivered at a preset rate.
- **Spontaneous (SPON):** Every ventilation is triggered by the patient (If the patient does not breathe the ventilator does not ventilate.)

Terminology and typical settings.
- **Rate:** Number of ventilations to be given per minute (60 seconds)
- **Tidal Volume (Vt):** Volume of air given per ventilation milliliters (mL)
  - Typically 5-7 mL / lb (11-15.4 mL / kg) to *ideal body weight*

<table>
<thead>
<tr>
<th>Ideal Body Weight</th>
<th>50kg (110lb)</th>
<th>60kg (132)</th>
<th>70kg (154lb)</th>
<th>80kg (176lb)</th>
<th>90kg (198lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tidal Volume (Vt)</td>
<td>550</td>
<td>792</td>
<td>924</td>
<td>1056</td>
<td>1188</td>
</tr>
</tbody>
</table>

- **Post End Expiratory Pressure (PEEP):** Residual pressure remaining in lungs at the end of exhalation.
  - Typically 3-5 mmhg
  - Chronic lungs and COPD patients often run higher
- **Fraction of Oxygen (O2, FIO2):** The concentration of O2 being delivered to the patient with each ventilation *(referred to as O2 on the ventilator)*
- **Peak Pressure (Peak):** The pressure applied by the patient during exhalation
  - **High Alarm:** High point at which the patient’s peak pressure causes the ventilator to alert the crew of a potential problem
  - **Low Alarm:** Low point at which the patient’s peak pressure causes the ventilator to alert the crew of a potential problem
- **Inspiratory to Expiratory Time (I:E Ratio):** Number of seconds of ventilation (inhalation) per second of exhalation
- **Pressure Support (PS):** The amount of pressure (mmhg) delivered to the patient with each triggered breath
  - Used in SIMV mode
- **Sensitivity (P_trig or Pressure Trigger):** The required negative pressure in the circuit applied by the patient to trigger a ventilation
  - Typically -1.2-2 mmhg

*Settings based on 6mL / kg

Continued on following pages
**Airway Guidelines (215.00)**

(Page 15 of 22)

Ventilator Guidelines Continued

**Set-up Instructions.**

- Remove HT70 and disposable “Y” circuit from the ventilator bag
- Connect the circuit to the HT70
  - **Note: Each part will only attach in one location**
- Connect the ventilator to the unit’s oxygen supply with the appropriate hoses
- Place test lung beside the HT70 (**DO NOT CONNECT IT YET**)
- Turn on the ventilator via the switch located on the back of the ventilator
  - Once the machine turns on (display will say “Welcome to HT70”)
    - Select “Check Circuit” on the screen (top center)
    - Follow the on screen directions throughout the circuit check
      - Use the blue circuit cap to occlude patient end of the circuit
      - Maintain control of the ventilator to prevent it from falling
    - Circuit check is complete press the “Main” button on the screen
    - Attach the test lung
    - Alarm will sound stating the HT70 is on external power
      - **Press and hold the “Alarm Silence Reset” button** located just above the screen until the main screen reappears
    - Enter the ventilator settings (if available) and press “Start Ventilation”
      - Press “Accept” after entering each setting
      - PEEP must be at least 5 mmhg lower than the Pressure Control (PC) setting (located directly above PEEP on the screen)
    - Allow the ventilator to cycle through a few ventilations
    - Setup is complete
- To turn the HT70 off (1) toggle the on / off switch, (2) press “Accept” (alarm will sound), (3) press the “Alarm Silence Reset” button.

**Treatment.**

*Emergency Medical Technician.*
The EMT should assist the paramedic with the patient according to their scope of practice

*Paramedic.*

- **ALERT: Ventilator patients must be constantly monitored for changes in status (See specific treatment situations on the following pages for guidance.)**
- For all ventilator transports the following must be brought into the facility:
  - HT70 (with appropriate wall hose and connector to use on facility supply)
  - HT70 tray
  - Cardiac monitor
  - IV pump
- Crews must re-verify all ventilator settings with facility staff prior to transferring the patient from the facility’s to Century’s ventilator
- Ask the nurse if the patient has any sedation for transport or if they have been given anything for transport
Airway Guidelines (215.00)
(Page 16 of 22)

Ventilator Guidelines Continued

Treatment continued.  
Paramedic continued.

- Prior to disconnecting the patient from the facility ventilator, if they are already on a ventilator, ensure that the HT70 is
  - powered on;
  - plugged into the facility O2 supply;
  - set to the correct settings (The HT70 will auto set to the prior circuit test settings);
  - all tubing is connected (Do not disconnect the circuit after testing in the unit.);
    - Follow End Tidal CO2 (ETCO2) Monitoring Guidelines for instructions the ETCO2 sensor on warm up and connection
    - The correct order of connections from the patient to the HT70 is:
      - Trach / E.T. Tube
      - Inline suction
      - Filter
      - ETCO2 adaptor
      - Ventilator circuit
      - Filter (*if needed)
      - HT70
    - and the HT70 is ventilating the test lung.
- Ask the facility to suction the patient prior to the ventilator swap
- Prior to transferring the patient to the stretcher or to the HT70 the crew must inform them (the patient) of exactly what is going on and what to expect
  - This applies to the unresponsive patient also
- Swap ventilators while patient is still on the facility’s bed
- Warn the patient that an alarm will sound after swapping ventilators, but that nothing is wrong
  - Press the “Alarm Silence Reset” button to silence the alarm
  - Allow 30 seconds for the patient to begin to adjust to the HT70
  - Set the high and low alarms as follows:
    - Press the Alarm button (If the alarm is highlighted in bright red press the up or down arrows to allow for the Alarm Quickset to be completed.)
    - Press the Alarm Quickset button (lower right portion of the screen)
      - Allow ~30 seconds for alarms to be auto-set by the HT70
    - Return to the main screen by pressing the “Main” button
- Unless the patient is a Trauma, STEMI Alert, or other emergency status, the patient must be placed on the HT70 for thirty (30) minutes alarm free prior to transport
  - Monitor and reassess the patient frequently during the thirty (30) minute test period
- Once test period is complete sheet the patient to the stretcher ensuring that all tubes and connectors are clear and have enough slack to complete the move
  - The HT70 should be placed on the HT70 tray for easy access
Ventilator Guidelines Continued

Treatment continued. Paramedic continued.

- Reassess the patient after each transfer by auscultating the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs (Follow Airway Guidelines [215.00])
- Do not attach the HT70 to the portable O2 cylinder until it is time to exit the facility.
  - This reduces the risk of running out of O2 prior to transfer to the unit supply
- Cover patient appropriate for the season and weather
  - Patients often have an adverse reaction to being wheeled outside as they are more susceptible to sudden changes in air temperature
- After loading the patient into the unit again reassess the patient by auscultating the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs (Follow Airway Guidelines [215.00])
- Upon loading the patient into the unit transfer the O2 hose to the unit supply
- Attach the power supply to the HT70
  - DO NOT FORGET TO DETACH IT PRIOR TO EXITING THE AMBULANCE
- Once at destination work back through the above instructions ensuring that you reassess the patient after transferring them to the facility’s bed by auscultating the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs
- Do not transfer ventilators until the receiving facility’s ventilator is up and running with the respiratory therapist present

Specific treatment situations.

- Initiation of Ventilator Support Post Intubation
  - Initial settings are as follows:
    - Tidal Volume
      - Set at 5-7 mL / lb (11-15.4 mL / kg) to IDEAL BODY WEIGHT
    - Ideal Body Weight
      | Tidal Volume (V_t) | 50kg (110lb) | 60kg (132) | 70kg (154lb) | 80kg (176lb) | 90kg (198lb) |
      |-------------------|-------------|------------|-------------|-------------|-------------|
      | 550               | 792         | 924        | 1056        | 1188        |
    - *Settings based on 6mL / lb (13.2mL / kg)
    - Rate (Starting)
      - Adult: 10-14
      - Child: 16-20
    - PEEP (Assist Control)
      - Starting: 5
    - Pressure Support (SIMV only) *COPD Patients
      - Starting: 8
    - FIO2
      - Assist Control: 100%
      - SIMV (COPD Patients): 40% starting then titrated to maintain 90% O2
Specific treatment situations continued.

- In all cases where an issue arises the following should be done prior to any other intervention:
  - The patient should be reassessed by auscultating the epigastrium in the mid-line slightly inferior to the xiphoid process and then lungs (Follow Airway Guidelines (215.00))
  - The HT70 equipment settings and status should be checked
  - Remember DOPE (Displacement / Disconnect, Obstruction, Pneumothorax, Equipment failure)

- **Difficulty Tolerating Vent**
  - Check Pressure Trigger
    - Double breath indicates pressure trigger too low
      - Gradually increase until double breath stops
    - Straining to breathe indicates pressure trigger is too high
      - Decrease until breathing seems appropriately relaxed
  - Make sure I:E ratio reflects a lower : higher number (generally 1:2, 1:3)
    - Adjusting the flow adjusts the I:E ratio
  - Request sedation

- **Low CO2 Level (Determined from BASELINE)**
  - Decrease rate

- **High CO2 Level (Determined from BASELINE)**
  - Increase rate of respiration 2 at a time to a total of 4
  - If unable to decrease CO2 by rate then remove patient from HT70 and ventilate at 100% with BVM for approximately two (2) minutes
    - If still unable to stop rising CO2 call med control

- **High Peak Pressure Alarm**
  - Look at patient, are they
    - Moving
    - Coughing
    - Blowing back into vent
    - If any of the above are true no action needed
  - Consider suctioning
  - Consider tube displacement to right main stem bronchus

- **Low Peak Pressure**
  - Patient is disconnected from HT70

---

*BiPAP guidelines are detailed on the following pages.*
BiPAP Guidelines

Contraindications.
- Patient unable to maintain their own airway
- Combative / uncooperative

Precautions.
- **Find out DNR Status in case a more advanced airway is needed en route**
- Must have a blue tip non-vented mask for use with the HT70
- Must have teeth in place
  - If not, consider rolled 4X4’s at the gum line
    - Airway obstruction may be a risk
- Must have proper mask seal
  - Need to be clean shaven
    - If not, consider Vaseline gauze around mask to create seal
    - Airway obstruction may be a risk

Modes.
- **Spontaneous / Volume**: Breathing on their own but are getting volume support (alveoli are being kept open) from the HT70
- **Assist control / Pressure control**: The HT70 is assisting with breathing (breaths are triggered by patient) and volume (alveoli are being kept open)
  - Patient is “circling the drain”

### Terminology and typical settings.
- **Rate**: Minimum ventilation rate. (On assist control rate should be set at 12)
- **Expiratory Positive Airway Pressure (EPAP) or Post End Expiratory Pressure (PEEP)**: Residual pressure remaining in lungs at the end of exhalation.
  - Typically 3-5 mmhg
  - Chronic lungs and COPD patients often run higher
- **Fraction of Oxygen (O2, FIO2)**: The concentration of O2 being delivered to the patient (referred to as O2 on the HT70)
- **Inspiratory Positive Airway Pressure (IPAP) or Pressure Support (PS)**: The amount of pressure (mmhg) delivered to the patient with each triggered breath in spontaneous mode
- **Pressure Control**: In BiPAP, the pressure control determines the tidal volume. When the negative pressure in the chest equalizes the assisted ventilation ceases (The harder the patient draws in, the greater the pressure gradient, and the higher the flow.)
- **Sensitivity (P\text{trig} or Pressure Trigger)**: The required negative pressure in the circuit applied by the patient to trigger a ventilation
  - Typically -1.2-2 mmhg

*BiPAP guidelines are continued on following pages*
BiPAP Guidelines Continued

Set-up Instructions.
- Remove HT70 and disposable circuit, optional filter and mask (with harness) from bag
- Connect the mask and circuit to the HT70
  - Note: Each part will only attach in one location
- Place test lung beside the HT70 (DO NOT CONNECT IT YET)
- Turn on the HT70 via the switch located on the back of the ventilator
  - Once the machine turns on (display will say “Welcome to HT70”)
    - Select “Check Circuit” on the screen (top center)
    - Follow the on screen directions throughout the circuit check
      - Use the test lung in lieu of the mask to occlude patient end of the circuit
      - Maintain control of the HT70 to prevent it from falling
    - Circuit check is complete press the “Main” button on the screen
    - Alarm will sound stating the ventilator is on external power
      - Press and hold the “Alarm Silence Reset” button located just above the screen until the main screen reappears
    - Enter the BiPAP settings (if available) and press “Start Ventilation”
      - Press “Accept” after entering each setting
      - PEEP must be at least 5 mmhg lower than the Pressure Control (PC) setting (located directly above PEEP on the screen)
    - Allow the HT70 let it operate for approximately 30 seconds
    - Setup is complete
- To turn the HT70 off (1) toggle the on / off switch, (2) press “Accept” (alarm will sound), (3) press the “Alarm Silence Reset” button.

Treatment.

Emergency Medical Technician.
The EMT should assist the paramedic with the patient according to their scope of practice

Paramedic.
- ALERT: BiPAP patients must be constantly monitored for changes in status (See specific treatment situations on the following pages for guidance.)
  - Knowing the DNR status of the patient is critical
- For all BiPAP transports the following must be brought into the facility:
  - HT70 (with appropriate wall hose and connector to use on facility O2 supply)
  - HT70 tray
  - Cardiac monitor
  - IV pump
- Crews must re-verify all BiPAP settings with facility staff prior to transferring the patient from the facility’s to Century’s ventilator
BiPAP Guidelines Continued

Treatment continued.  
Paramedic continued.

- Prior to disconnecting the patient from the facility BiPAP, if they are already on a BiPAP, ensure that the HT70 is
  - powered on;
  - plugged into the facility O2 supply (if applicable);
  - set to the correct settings (The HT70 will auto set to the prior circuit test settings);
  - all tubing is connected (Do not disconnect the circuit after testing in the unit.);
    - The correct order of connections from the patient to the HT70 is:
      - Face mask (with harness)
      - BiPAP circuit
      - Filter (*if needed for isolation)
      - HT70
- Prior to transferring the patient to the stretcher or to the HT70 the crew must inform them (the patient) of exactly what is going on and what to expect
- Swap BiPAP machines while patient is still on the facility’s bed
- Warn the patient that an alarm will sound after swapping machines, but that nothing is wrong
  - Press the “Alarm Silence Reset” button to silence the alarm
  - Allow 30 seconds for the patient to begin to adjust to the HT70
    - If patient struggles to breath instruct them to take a deep breath
    - If patient still struggles to breath hit the “Manual Ventilation” button on the screen
  - Set the high and low alarms as follows:
    - Press the Alarm button (If the alarm is highlighted in bright red press the up or down arrows to allow for the Alarm Quickset to be completed.)
    - Press the Alarm Quickset button (lower right portion of the screen)
    - Allow ~30 seconds for alarms to be auto-set by the HT70
    - Return to the main screen by pressing the “Main” button
- Unless the patient is a Trauma, STEMI Alert, or other emergency status, the patient must be placed on the HT70 for thirty (30) minutes alarm free prior to transport
  - Monitor and reassess the patient frequently during the thirty (30) minute test period
- Once test period is complete sheet the patient to the stretcher ensuring that all tubes and connectors are clear and have enough slack to complete the move
  - The HT70 should be placed on the HT70 tray for easy access
- Do not attach the HT70 to the portable O2 cylinder (if O2 is required) until it is time to exit the facility.
  - This reduces the risk of running out of O2 prior to transfer to the unit supply
- Cover patient appropriate for the season and weather
  - Patients often have an adverse reaction to being wheeled outside as they are more susceptible to sudden changes in air temperature
BiPAP Guidelines Continued

Treatment continued.  
*Paramedic continued.*

- Upon loading the patient into the unit transfer the O2 hose to the unit supply
- Attach the power supply to the unit
  - *DO NOT FORGET TO DETACH IT PRIOR TO EXITING THE AMBULANCE*
- Once at destination work back through the above instructions ensuring that you reassess the patient after transferring them to the facility’s bed (Follow Airway Guidelines [215.00])
- Do not transfer BiPAP until the receiving facility’s BiPAP is up and running with the respiratory therapist present

**Specific treatment situations.**

- *Initiation of BiPAP support by Century crews*
  - Initial settings are as follows:
    - **Mode**
      - *Respiratory distress:* Spontaneous / Volume
      - *Imminent respiratory failure:* Assist control / Pressure control
    - **Pressure Support**
      - COPD: 16
      - Non-COPD: 10
    - **PEEP**
      - COPD: 8
      - Non-COPD: 5
    - **Sensitivity (Ptrig or Pressure Trigger):** 1.2 starting

- In all cases where an issue arises the following should be done prior to any other intervention:
  - The equipment settings and status should be checked
  - Check mask seal
  - Remember DOPE (Displacement / Disconnect, Obstruction, Pneumothorax, Equipment failure)

- *Difficulty Tolerating Vent*
  - Consider talking to physician about intubation options
Indications
- Prevents vomiting with resultant aspiration of gastric contents
- Evacuation of gastric contents in cases of recent known toxic ingestion
- Cardiopulmonary arrest to decompress the stomach, enhancing diaphragmatic excursion and allowing more effective ventilation and cardiac compressions

Contraindications
- NG / OG insertion is specifically contraindicated
  - Acute GI bleeding due to risks of rupturing esophageal varices with resultant hemorrhage
  - Caustic ingestion
  - Presence of midfacial trauma
  - Toxic ingestions greater than 45 minutes
- Relative contraindications to orogastric and nasogastric intubation include
  - Acute myocardial infarction (AMI)
  - Patients who present with lethargy or otherwise appear sedated
  - Pregnancy
  - Presence of head injury (passage of the tube through the pharynx may raise intracranial pressure)
  - Suspected aortic aneurysm

Potential Complications
- The most common problem encountered is coiling of the tube in the back of the throat
- Other complications include
  - Esophageal perforation
  - Inadvertent endotracheal intubation
  - Induction of gastrointestinal bleeding
  - Intracranial tube migration due to midfacial trauma
  - Nasal hemorrhage

Procedure for Paramedic (* indicates EMT skill)
- *Don proper PPE; prepare suction tubing with rigid catheter. Determine appropriate size of tube. In general, most adults should be intubated with a 12 - 18 F gastric device; tube diameter in pediatric patients should conform to that specified on the Broselow® Tape.
- Examine both nostrils and select the largest or least deviated (usually the right) for nasogastric tube placement
- Determine appropriate length for tube insertion
  - Nasogastric tubes should extend from the tip of the nose to the earlobe and then to the xiphoid process
  - Orogastric tubes should extend from the corner of the mouth to the earlobe and then to the xiphoid process
NG / OG Insertion (215.02)
(Page 2 of 2)

- Coil the distal end of the NG tube around your index finger to produce a flexible curve to ease insertion. Coat approximately four inches of this curved end with Lubricating jelly to minimize injury to the nasal passages.

- *Position patient appropriately for insertion:
  - If patient is the victim of trauma, maintain supine positioning with cervical spine immobilized in the neutral position
  - If the patient is not a trauma victim:
    - Unconscious: Place patient supine or in the “sniffing” position
    - Conscious: Place in 45 - 90 degree head up, knees flexed position (high Fowler’s position)

- Grasp tube with curve downward and insert into appropriate nostril. Advance NG tube downward on the floor of the nostril towards the closest ear.

- If performing orogastric intubation:
  - Coat the end of the tube with Lubricating jelly
  - Direct the curved distal end of the tube to the back of the tongue and then downward through the oropharynx

- Gently flex the head (in the non-trauma victim only!) as the tube proceeds past the pharynx. This positioning will close the trachea and make it easier for the tube to pass through the esophagus. This is the point at which the patient may start to gag or cough. Ask the patient to swallow and slowly advance the tube with each swallow. Look inside the mouth to see if the tube has become coiled at the back of the throat. If so, slowly withdraw the tube until it is straight and allow the patient to rest briefly before you try again.
  - The gag reflex will often be stimulated by tube passage. If vomiting occurs, remove tube and suction vigorously.
  - If patient exhibits any signs of respiratory distress, remove tube immediately. If patient continues to cough or choke with insertion and is unable to talk, withdraw the tube slightly as it may have accidentally entered the trachea.

- Advance tube to premeasured position and tape securely in place

- *Confirm tube placement:
  - Ask patient to speak
  - Place bell of stethoscope over patient’s stomach. Instill air into the distal end of the tube via 2 oz. (60cc) syringe and auscultate over the stomach for sounds of air motion.
  - Aspirate gastric contents (if unable to aspirate initially, advance tube 1-2 inches and re-attempt)

- *Attach tube to suction equipment and aspirate gastric contents. For toxic ingestion, lavage gastric contents with one liter of NS / sterile water. Clamp tube if no suction available.

- Document details of tube placement and aspirated gastric contents in the PCR.
Respiratory Insufficiency (215.04)

In the patient with severe respiratory compromise, treatment should be aggressive in order to prevent respiratory arrest. Patient anxiety is one of the first signs of hypoxia. Obtundation occurs with severe hypoxia/anoxia. In patients with COPD, emphysema or pulmonary edema who are in severe respiratory distress consider immediate BiPAP support to diminish alveolar fluid and “prop open” the airway which allows a more complete exhalation (eliminates air trapping in the chronic “lunger.”) (Follow BiPAP Guidelines Special Treatment Situations (215.00))

Note: HT70 ventilator / BiPAP units are only equipped on specific units.

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
  - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)

Specific treatment situations. (See below and on next page.)
- Chronic Obstructive Pulmonary Disease (COPD) such as emphysema and bronchitis
  - Albuterol 2.5 mg and Atrovent 0.5 mg (subsequent nebulizer treatments will contain only Albuterol)
  - If satisfactory response to the initial nebulizer treatment is not obtained or the patient is experiencing severe distress administer Magnesium Sulfate [2 grams diluted in 100 mL NS administered at a rate not to exceed 60 gtts / min (120 mg / min) using the 10 gtts / mL drip set]
  - If satisfactory response is not obtained or clinical judgment indicates that the patient will not respond quickly to the treatments above then place patient on BiPAP support (Follow BiPAP Guidelines Special Treatment Situations [215.00])
    - Continue above treatments while utilizing the CPAP device
  - If satisfactory response is not obtained and SpO2 is less than 90% despite 100% O2 for the patient experiencing severe distress, intubate and assist ventilations with positive pressure ventilation (PPV)
  - If the patient has been sedated, but is unable to be intubated, ventilate with a BVM
    - Consider King tube in the patient without a gag reflex
Respiratory Insufficiency (215.04)
(Page 2 of 2)

- **Asthma / Pneumonia**
  - **Albuterol 2.5 mg** and **Atrovent 0.5 mg** (repeat nebulizer treatments will contain only Albuterol)
  - If asthma, consider **Epinephrine 1:1000 0.3 to 0.5 mg** SQ / IM, only if patient is less than 45 years old
  - If satisfactory response to the initial nebulizer treatment is not obtained or the patient is experiencing severe distress administer **Magnesium Sulfate** [2 grams diluted in 100 mL NS administered at a rate not to exceed 60 gtts / min (120 mg / min) using the 10 gtts / mL drip set]
  - If unsatisfactory response or clinical judgment indicates that the patient will not respond quickly to the treatments above then, follow **BiPAP Guidelines Special Treatment Situations (215.00)**
    - Continue above treatments while utilizing the CPAP device
  - If unsatisfactory response and SpO2 is less than 90% despite 100% O2 for the patient experiencing severe distress, assist ventilations with positive pressure ventilation and intubate
  - If the patient has been sedated but is unable to be intubated, ventilate with a BVM
    - Consider King tube in the patient without a gag reflex

- **Spontaneous Pneumothorax**
  - Administer 100% O2
  - Intubate or perform advanced airway control as indicated

- **Tension Pneumothorax**
  - Administer 100% O2
  - Follow **Needle Thoracentesis Guidelines (215.08)**
  - Intubate or perform advanced airway control as indicated

- **Respiratory Insufficiency due to Anaphylaxis**
  - Follow **Allergic Reaction / Anaphylaxis Guidelines (230.10)**
  - Anticipate rapid deterioration and the need to intubate
Hyperventilation (215.06)

(Hyperventilation syndrome is characterized by rapid breathing, chest pains, numbness and other symptoms usually associated with anxiety or a situational reaction. However, many serious medical problems can cause hyperventilation. To avoid improper treatment, consider hyperventilation indicative of a serious medical problem until proven otherwise.

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Do not administer any CO2 rebreathing techniques

Paramedic.
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Treat underlying cause per specific guideline
Needle Thoracentesis Procedure

Needle thoracentesis is also called needle decompression is a paramedic skill and is performed as follows:

- Identify puncture site
  - Second intercostal space on affected side in the mid-clavicular line for Pneumothorax.
  - Fifth intercostals space on affected side in the midaxillary line for Hemopneumothorax.
- Prepare skin at puncture site with Betadine or alcohol swabs
- Insert 14-gauge 2 inch angiocath over top of inferior rib, perpendicular to skin at puncture site (remove any parts which may occlude the lumen from the catheter / needle assembly)
- Listen for a rush of air; if noted, the diagnosis of tension pneumothorax and proper needle placement is confirmed
- Remove needle from catheter (even if escape of air not heard); secure catheter in place
- If air collection reaccumulates, perform second needle thoracentesis on the same side
- Continuously re-assess the ventilation status of the patient
Consider possible causes of respiratory arrest. (See below for common causes.)

**Assessment**
- Onset (acute or gradual) and duration
- Environmental exposure
- Evidence of trauma
- Exacerbating or alleviating factors
- Home O2
- Medical History
  - Medical illnesses (e.g., COPD, asthma, diabetes, CHF, thrombophlebitis)
  - Medications
  - Allergies
- Oral exposure / foreign bodies (e.g., toys, drugs, alcohol, food, chemicals, etc.)
- Smoking, drug, or alcohol use

**Common Causes**
- Acute bronchitis, pneumonia
- Acute upper airway obstruction
- Asthma
- Chest trauma
- CHF / Acute myocardial infarction (AMI)
- Diabetic ketoacidosis (DKA)
- Drowning and asphyxiation
- Environmental exposure (e.g., chemicals, irritants, etc.)
- Epiglottitis
- Pulmonary edema
- Overdose and poisoning

**Signs and Symptoms**
- Cardiovascular:
  - Neck vein distention
  - Dysrhythmias
- Fever
- No breathing or abnormal breathing
- Skin
  - Cyanosis
  - Peripheral edema (Abnormal buildup of fluid in the ankles, feet and legs)
  - Hives
  - Subcutaneous emphysema
- Unresponsiveness
- Upper airway or facial edema
- Vital Signs
  - Vary
Respiratory Arrest / Failure (215.10)
(Page 2 of 2)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Foreign Body Airway Obstruction (FBAO) maneuvers as indicated below:
    - Conscious
      - Mild Obstruction (with good air exchange):
        - Encourage patient’s own spontaneous coughing and breathing efforts
      - Severe Obstruction:
        - Abdominal Thrusts (Heimlich maneuver)
        - If patient is pregnant or obese, perform chest thrusts instead of abdominal thrusts
    - Unconscious
      - Reposition airway
      - Before ventilating and after opening the airway, look for obstruction and remove if visible
      - Begin CPR
      - Suction as indicated
      - If choking relieved, then follow BLS Healthcare Provider Algorithm
- Ventilate with a BVM at 100% O2

Paramedic.
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
    - FBAO: visualize and remove any object using direct laryngoscopy. If foreign body cannot be removed or dislodged, attempt to bypass or push the obstruction into one bronchus below the carina.
    - Intubate or perform advanced airway control
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- If positive pressure ventilation is performed for a time period greater than 5 minutes before intubation or if the patient’s abdomen becomes distended, insert appropriate sized nasogastric (NG) tube
  - NG / OG Insertion Guidelines (215.02)
- Assess patient for potential reversible causes (e.g., drug overdose, hypoglycemia, etc.) and follow appropriate guidelines
Drowning / Near-drowning Submersion (215.12)
(Page 1 of 2)

Assessment
- Fresh or salt water
- Length of submersion
- Past medical history
- Trauma (e.g., diving accident, scuba diving, child abuse)
- Warm or cold water
- Water contamination (clean, drainage, scum, sewage, etc.)
- Water depth

Signs and Symptoms
- Cardiac
  - Dysrhythmias
- Dyspnea
- HEENT
  - Head or neck trauma
- Neurologic
  - Decreased level of consciousness
  - Seizures
- Pleuritic chest pain
- Respiratory
  - Airway obstruction
  - Cough
  - Frothy sputum
  - Rales
  - Respiratory distress / dyspnea
  - Rhonchi
  - Wheezing
- Skin
  - Cold
  - Cyanosis
  - Pallor
- Vital Signs
  - Vary
- Vomiting
Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- If trauma suspected, follow Spinal Immobilization Guidelines (245.04)
- Protect from heat loss
- Remove wet clothing and cover with dry sheets / blankets if appropriate

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Anticipate rapid deterioration and the need to intubate
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- *Transport all near-drowning patients*
Things to know

- An established PICC line can be used as an IV access point
- Do NOT delay transport for IV/IO access
- The preferred route for fluid/medication administration is intravenously (IV)
- Vascular access is secondary to CPR, airway interventions and appropriate diagnostic procedures and should be performed concurrently when available personnel allows

Intravenous Access

Notes.

- Establish access in the largest and most accessible peripheral vein, when possible.
- Use a large bore angio-cath for patients who need or may need fluid resuscitation or blood.

Criteria for venous access.

- The chief complaint may indicate a serious medical or traumatic condition
- The paramedic feels that the patient may benefit from IV access
- The patient requires IV fluid or medication(s)

Authority to establish IV access.

1. Any Century paramedic
2. Any paramedic student who is supervised by a CENTURY paramedic and is in compliance with F.A.C 64J-1

Procedure for paramedic (*indicates EMT skill).

1. Don appropriate PPE
2. Prepare an area near the patient that is clean
3. Assemble all equipment near the patient
4. Apply constricting band
5. Locate insertion site- use a large and/or straight vein when possible
6. Cleanse with alcohol prep use aseptic technique
7. Choose angio-cath
   - Remove from the protective cover
   - Twist the hub of the catheter without advancing the catheter over the needle to ensure it will slide freely once flash is noted.
8. Pull the skin taught over the insertion site
9. Insert the needle into the skin bevel up and do not exceed 45 degrees
10. Advance angio-cath into the vein until blood noted in the flash chamber
11. Advance catheter into the vein
12. Apply pressure proximal to the insertion site to occlude the vein
13. Release constricting band
14. Attach IV/INT to the hub of the catheter (screw luer-lock to hub)
15. Release proximal pressure
16. Flush with NS
17. * Apply transparent adhesive dressing (e.g., Opsite®, Tegaderm™) if available
Intravenous Access Continued

Procedure for paramedic continued (*indicates EMT skill).

18. * Tape in place
19. Confirm there are no signs of infiltration
   o Swelling
   o Tenderness
   o Discoloration (bruising or redness)
20. Reassess periodically

Intraosseous Access (IO)

Notes.
- Century carries Jamshidi IO needles.
- IO access may be used in adult or pediatric patients
- IO insertion site selection is not affected by paralysis
- IO may be considered earlier in the arrest setting
- Preferred Site – Proximal Tibia (Medial Aspect)

Criteria for IO access.
- Must meet all the following in the non-arrest patient
  o Severe cardiovascular compromise or unconscious / unresponsive
  o Two failed IV attempts or more than 90 seconds
  o Urgent need for fluid / medication administration

Authority to establish IO access.
Any Century paramedic or paramedic student who is supervised by a CENTURY paramedic and is in compliance with F.A.C 64J-1

Contraindications.
- Ability to readily obtain peripheral or external jugular IV access
- Compromising pre-existing medical condition (e.g., bone cancer, peripheral vascular disease)
- Excessive tissue at the selected insertion site (consider alternative site)
- Fracture of the tibia or the humerus (consider alternative site)
- Fracture of the humerus (consider alternative site)
- Inability to identify appropriate anatomical landmarks
- Infection at the selected site
- Previous significant orthopedic procedures (e.g., IO within 24 hours, joint replacement)
Intraosseous Access Continued (IO)

Procedure for paramedic.

- Don appropriate PPE
- Identify appropriate indication(s) and absence of contraindications

Proximal Tibia

- Select the site and identify the appropriate landmarks
  - Proximal tibia (medial aspect)
  - Humerus
    - Indications for this site
      - Bilateral tibia fractures
      - Questionable circulatory status at or below the level of the pelvis
    - Distal tibia (medial aspect) tertiary site
      - Do not use the tibia site if a fracture is suspected.

- Cleanse insertion site with alcohol or betadine swab.
- Needle selection will be based on the amount of soft tissue at the insertion site. Gauge the amount of soft tissue by pressing the site with your thumb and correlate the finding with the appropriate needle length.
  - 15 gauge (15/16in – 1 7/8in adjustable length)
  - 18 gauge (1/16in – 1 7/16in adjustable length)
  - It is better to select a needle too long than too short

- Tilt the needle caudally (toward the posterior end of the body) to avoid puncturing the epiphysis.
- Stabilize site and manually insert the needle set through the skin until it contacts the surface of the bone.
  - Do NOT place the stabilizing hand directly in line with the needle.
- With the needle contacting the bone rotate the screw-adjustable stabilizer (hub) until the skirt is the correct distance above the skin as follows:
  - 1/4 inch for adolescents and adults
  - 1/8 inch for infants and children
- Rotate the needle in a screw like motion through the bone until the needle gives a sudden loss of resistance.
- Once the needle is in the correct position further adjust the hub until it is flush with the skin and confirm placement.
  - IO catheter stands firmly seated at a 90-degree angle to the insertion site
- Remove the trocar while supporting the adjustable guard and attach an INT to the hub.
- Secure the trocar in an appropriate sharps container.
Intraosseous Access Continued (IO)

Procedure for paramedic continued.

- **Conscious or semi-conscious patient**
  - Lidocaine for suppression of intramedullary pressure receptors; allow 1 minute for anesthetic effect
    - Flush the IO with Lidocaine
      - Adult patient: **20 to 40mg** IO
        - Include the amount flushed in the total dose
      - Pediatric patient: **0.5mg / kg** IO
        - Include the amount flushed in the total dose
      - Contact the receiving facility to repeat the dose
    - Then flush site with **10mL NS**

- **Unconscious patient**
  - Flush site with **10mL NS**
  - Utilize a pressure infusion bag for NS fluid administration
  - Follow any medication infusion with **10mL NS**
  - Dress site and secure the tubing
    - Secure the line firmly after insertion.
      - An acceptable technique is to apply tape to either side of the plastic skirt.
      - Additional stability may be achieved by padding the plastic extension between the skirt and the hub with gauze prior to taping or by placing a small cup with a hole for the intravenous tubing over the device as an additional layer of protection.
  - Monitor the IO site for evidence of leakage (extravasation) underneath the skin.
    - If it is determined that the IO needle is not properly placed (extravasation noted) it must be removed prior to delivering the patient to the receiving facility
      - Attach a 10mL syringe to the catheter hub
      - Support the insertion site while rotating the syringe clockwise and gently pull the catheter out without rocking
      - Secure the catheter in an appropriate sharps container
  - A properly placed Jamshidi IO catheter will NOT be removed in the field; the patient MUST be transported to the appropriate receiving facility.
The use of fluids to resuscitate a patient is based on the need to maintain cerebral perfusion, which requires the maintenance of a systolic BP of 90 mmHg. Experience and judgment must guide the paramedic in the use of fluids. *The risks of prolonged scene time must be weighed against the benefits of the fluid challenge.*

*Note: Fluid challenges are a paramedic skill.*

**Contraindications**
- *Do not over hydrate patient.*
- Evidence of CHF (e.g., rales, pulmonary edema)
  - Auscultate breath sounds frequently.

**Use and Expected Results**
- NS should be used for volume resuscitation
- Desired effect (responds appropriately) is based on the patient’s clinical response
  - Capillary refill time of 2 seconds or less
  - Decrease in heart rate
  - Improved level of consciousness
  - Improved pulse quality
  - Increase in systolic blood pressure
  - Warm extremities

The following situations do NOT require a fluid challenge, and instead should be administered either NS at Keep Vein Open (KVO) rate of 20 mL/hr or an INT.
- Hypertension
- Hypothermia
- Normotension

Adult specific treatment situations are detailed on the next page.
Pediatric and neonate specific treatment situations are detailed on page 3 of these protocols.
Fluid Challenge (220.02)
(Page 2 of 3)

Adult Specific Treatment Situations Requiring Fluid Challenges
Adult.
Burns.
• Normal BP
  o NS infusion at 1500 mL / hr
• Hypotension
  o NS 20 mL / kg infusion
    ▪ If the patient responds appropriately repeat infusion to a maximum of 60 mL / kg
    ▪ If the patient does not respond, no additional infusions
Cardiac / trauma arrest.
• Palpate femoral pulse during CPR
  o If no pulse present; NS 20 mL / kg infusion
    ▪ If pulse is noted during or after the infusion; repeat infusion to a maximum of 60 mL / kg
  o If no pulse is noted; limit fluid to 500 mL
Cardiogenic Shock.
• Fluid restriction 200 to 500 mL infusion
Crush Syndrome.
• Infuse NS 1500 mL / hr
  o Fluid replacement should be initiated prior to removing the weight
Hypotension; Medical (atraumatic hemorrhage, distributive shock, unknown cause)
• NS 20 mL / kg infusion
  ▪ If the patient responds appropriately, repeat infusion to a maximum of 60 mL / kg
  ▪ If the patient does not respond, no additional infusions
Hypotension; Trauma.
• NS 20 mL / kg infusion
  ▪ If the patient responds appropriately, repeat infusion ONLY ONCE
  ▪ If the patient does not respond, no additional infusions
Pericardial tamponade.
• Rapidly infuse NS 500 mL

Pediatric and neonate specific treatment situations are detailed on the next page.
Pediatric Specific Treatment Situations Requiring Fluid Challenges

**Pediatric.**

- **The most common error in fluid resuscitation in children is the reluctance to provide adequate volume**
- Catecholamines (epinephrine / dopamine) are seldom indicated in the pre-hospital treatment of hypovolemic shock in children
  - Contact receiving facility for guidance before administering
- Consider using the Broselow® Tape for fluid infusion dose

**Pediatric Hypovolemic Shock** (e.g., vomiting, diarrhea, fever).

- **NS 20 mL / kg infusion**
  - If the patient responds appropriately, repeat infusion to a **maximum of 60 mL / kg**
  - If the patient does not respond, no additional infusions

**Pediatric Distributive Shock** (e.g., sepsis, anaphylaxis).

- **NS 20 mL / kg infusion**
  - If the patient responds appropriately, repeat infusion to a **maximum of 60 mL / kg**
  - If the patient does not respond, no additional infusions

**Pediatric Cardiogenic Shock.**

- **NS 5 to 10 mL / kg IV / IO**
  - If improvement in systolic BP noted, repeat dose
    - **DO NOT over hydrate patient**
  - **Fluid challenge contraindicated if there is evidence of congestive heart failure**
    (e.g., rales, pulmonary edema)

**Pediatric Toxic Ingestion / Exposure.**

- **NS 5 to 10 mL / kg IV / IO**
  - If improvement in systolic BP noted, repeat dose

**Pediatric Diabetic Ketoacidosis.**

- **NS 10 mL / kg over 1 hour**
  - Consider using the Broselow® Tape for fluid infusion dose
- **NS 10mL / kg infusion**
  - If the patient responds appropriately, repeat infusion ONLY ONCE

**Keep patient warm**
Pain Management (225.00)
(Page 1 of 3)

Pain is defined as an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of such damage. Management is reliant on assessment and past medical history. Patients with chronic pain should not receive pain medication by Century paramedics.

Signs and Symptoms
- **Minor pain**
  - Pain Scale Rating 0 to 2
- **Moderate pain**
  - Pain Scale Rating 3 to 6
  - Vital signs vary
- **Severe pain**
  - Diaphoresis
  - Hypertension
  - Pain Scale Rating 7 to 10
  - Restlessness
  - Tachycardia
  - Tachypnea

Indications
- Moderate or severe pain
- Abdominal / flank pain with a diagnosed or known cause
  - Kidney stones, gall stones, trauma, etc.
- AMI
- Acute sickle cell pain with fever
- Burns
- Discomfort associated with electrical therapy (e.g., pacing, synchronized cardioversion, discharge of Automated Implantable Cardioverter Defibrillator (AICD))
- Isolated skeletal injuries
  - Suspected injury of a single bone or joint

Contraindications
- Acute or undiagnosed abdominal pain or abdominal pain of unknown cause
- Allergy to the medication
- Altered mental status
- Brain injury (traumatic or stroke)
- Chronic pain
- Hypotension (systolic BP less than 90 mmHg) including hypotension that develops after the administration of analgesic medications
- Respiratory depression
Pain Management (225.00)
(Page 2 of 3)

Treatment

Emergency Medical Technician.
- Administer supplemental O2, maintain saturation between 95 and 100%
- Calm and reassure patient
  - Verbally reassure the patient that their pain will be addressed
- Distract the patient by entering into other conversation
- Cold pack to the area of pain, if appropriate
- Maintain or allow the patient to assume the position that minimizes the patient’s pain and minimizes the chance of further injury (*This is one of the most powerful pain management tools available to EMS professionals.)*
- Splint, if indicated
- Monitor and record the patient’s perception of their pain using the pain rating scale

Paramedic.

Treating pain requires a total patient approach: comforting, distraction and pain medication. The patient must be completely examined and the pain assessed before medication is administered. The paramedic should continue the treatment the EMT started. When given an option of which analgesic to use, paramedic experience and judgment will be deciding the factor. The intent is only one analgesic per patient encounter. If the patient’s pain is not controlled with one analgesic then the receiving facility is contacted for advice.

Administration of analgesics must be documented in the field report, PCR and the verbal hospital report. Include vital signs, pain rating scale, dose and route, time of administration and effects of the medication.

Minor pain.
- Follow EMT treatment section only

Moderate pain.
- Treatment will be identical to severe pain, except repeat doses will not be administered

Severe pain treatment detailed on following page.
Pain Management (225.00)
(Page 3 of 3)

Treatment Continued

Paramedic continued.

Severe pain.

- Unless otherwise indicated below or otherwise contraindicated Morphine is Century’s analgesic of choice for pain management at the following dosage:
  - Morphine 2 to 5 mg IV
    - May repeat dose every 5 minutes to a maximum total dose of 10 mg
    - To exceed the maximum total dose (10 mg) contact receiving facility
    - Pediatric (less than 40 kg) dose 0.1 mg / kg IV

- Burns
  - Only use one analgesic

- Pacing / synchronized cardioversion / discharge of AICD
  - Versed 2 to 5 mg IV / IO
  - OR
  - Valium 2 to 5 mg IV / IO

- Sickle Cell with fever
  - Fluid challenge should be initiated prior to analgesia

- Skeletal
  - Fracture
    - Only use one analgesic
    - Fracture with obvious muscle spasms (e.g., joints, longbones fractures), use only one analgesic in addition to Versed
      - Versed 2 to 5 mg IV
        - May NOT repeat
      - Morphine 2 to 5 mg IV
        - May repeat dose every 5 minutes to a maximum total dose of 10 mg
        - To exceed the maximum total dose (10 mg) contact receiving facility
        - Pediatric (less than 40 kg) dose 0.1 mg / kg IV
Nausea / Vomiting (230.00)

(Page 1 of 1)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%

Paramedic.
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
    - Follow Hypotension / Shock Medical Guidelines (230.12) if appropriate
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- The primary treatment for the patient with gastro-intestinal related signs and symptoms is to re-hydrate them with IV fluids.
  - NS 250 mL fluid bolus before considering Zofran
    - Caution: Do not over-hydrate patient. Fluid Challenge contraindicated if there is evidence of congestive heart failure (e.g., rales, pulmonary edema).
- Zofran 4 mg IV / IO / IM (no faster than 30 seconds for IV / IO route)
Abdominal / Flank Pain (230.02)
(Page 1 of 2)

Assessment
- OPQRST
- Abnormal ingestion
- Medical History
  - Medical illnesses
  - Medications
  - Allergies
- Menstrual history
- Previous trauma
- Surgery
- Suspected pregnancy (e.g., ectopic)

Signs and Symptoms
- NVD (Nausea, vomiting, diarrhea)
  - (e.g., bloody, coffee-ground, tarry stool, etc.)
- Constipation
- Fever
- GI
  - Abdominal tenderness
  - Guarding
  - Distention
  - Pulsatile mass (Think AAA)
- Skin
  - Diaphoresis
  - Pallor
- Urinary problems
- Vaginal Discharge (abnormal bleeding)
- Vital Signs
  - Vary

Abdominal / flank pain treatments are detailed on the following page.
Abdominal / Flank Pain (230.02)
(Page 2 of 2)

Treatment

Emergency Medical Technician

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated

Paramedic.

- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Determine BGL by finger stick, if not previously obtained
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Follow Pain Management Guidelines (225.00) if indicated
Diabetic Emergencies (230.04)  
(Page 1 of 1)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Determine BGL by finger stick
  - For patients who are exhibiting signs and symptoms of hypoglycemia, conscious and able to swallow, administer oral glucose or sugar orally for BGL less than 70 mg/dl
- Do not allow the administration of insulin or oral diabetic medication for patients presenting with signs and symptoms of a diabetic emergency

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Determine BGL by finger stick, if not previously obtained
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip

Specific treatment situations.
- Symptomatic hypoglycemia
  - Thiamine 100 mg IV / IO / IM to all alcohol syndrome and malnourished patients prior to D50 W administration
  - D50W 12.5 grams IV / IO for BGL less than 70 mg/dl or Symptomatic Acute Stroke patient BGL less than 50 mg/dl
    - Repeat BGL by finger stick in 5 minutes
  - If no improvement and BGL is below 60 repeat D50W 12.5 grams
    - Repeat BGL by finger stick after 15 minutes
  - Note: Hyperglycemia resulting from the treatment of hypoglycemia is related to an increase in morbidity
- Hyperglycemia
  - If BGL is greater than 400 mg/dl and there is no indication of pulmonary edema, administer NS 250-500 mL over 30 minutes (120gtts/min, using 10gtts/mL infusion set)
  - Caution: Do not over-hydrate
Coma / Altered Consciousness (230.06)

Remember that alcohol impaired patients may have serious underlying illness or injury which may be masked. **Suspect c-spine injury in the presence of head trauma**

**Assessment**
- **OPQRST**
  - Onset; Provocation; Quality; Region; Severity; Time since onset
- **Medical History**
  - Medical illnesses (e.g. psychiatric disorders, diabetes, seizures, etc.)
  - Medications
  - Allergies
- Description of scene (e.g., pills found, notes, syringes, etc.)
- Drug or alcohol ingestion
- Exertion or heat exposure
- History of trauma
- Recent emotional trauma or crisis (including suicidal or homicidal ideation)
- Toxic exposure
- Unusual odor in residence or at scene

**Common Causes**
- Diabetes
- Drug overdose
- Head trauma
- Psychiatric illness
- Seizures
- Sepsis
- Stroke
- Other metabolic disorders, such as kidney or liver failure

**Signs and Symptoms**
- Abnormal breathing patterns
- Abrupt or bizarre behavior changes
- **HEENT**
  - Breath odor (alcohol, ketones)
  - Pupil size and reactivity
- Medical alert tag
- Nuchal rigidity (stiff neck)
- **Neurologic**
  - Decreased level of consciousness
  - Focal deficits
  - Hallucinations
  - Seizures
Coma / Altered Consciousness (230.06)
(Page 2 of 3)

Signs and Symptoms Continued
- Other
  - Evidence of trauma
- Skin
  - Cyanosis
  - Diaphoresis
  - Needle tracks
- Vital Signs
  - Vary

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Maintain aspiration prophylaxis by placing the patient in the recovery position
  - Administer 100% O2
- Determine BGL by finger stick
  - For patients who are conscious and able to swallow and who are exhibiting signs and symptoms of hypoglycemia, administer oral glucose or sugar orally for BGL less than 70 mg / dl
- If trauma suspected, follow Spinal Immobilization Guidelines (245.04)

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Determine BGL by finger stick, if not previously obtained
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip

Specific treatment situations on next page.
**Coma / Altered Consciousness (230.06)**

(Page 3 of 3)

Specific treatment situations.

- **Narcotic use**
  - Respiratory depression, unable to protect airway, administer **Narcan 0.5 mg IV / IO**
    - If no change in 5 minutes, repeat **Narcan 0.5 mg IV / IO**
    - May repeat to a **max total dose of 4 mg**
    - *The goal is to increase respirations, not LOC*

- **Symptomatic hypoglycemia**
  - *Caution: Hyperglycemia resulting from the treatment of hypoglycemia is related to an increase in morbidity*
  - **Thiamine 100 mg IV / IO / IM** to all alcohol syndrome and malnourished patients prior to D50W administration
  - **D50W 12.5 grams IV / IO** for BGL less than 70 mg / dl
    - Repeat BGL by finger stick after 5 minutes
  - If no improvement and BGL is below 60 repeat **D50W 12.5 grams**
    - Repeat BGL by finger stick after 15 minutes

- **Unknown etiology**
  - Consider other treatable neurological or metabolic disorders and if identified follow the appropriate guidelines
    - Assess temperature, 12 Lead ECG, SpCO, etc.
  - All unconscious patients of unknown etiology may be administered **Narcan 0.5 mg IV / IO**
Seizures (230.08)
(Page 1 of 2)

Things to Know
Status epilepticus is a single seizure lasting longer than 10 minutes or repeated seizures without full recovery of responsiveness between each seizure. Patients in status epilepticus should be treated aggressively (See specific treatment situations)

There are a wide variety of seizure etiologies and treatment should be tailored to the individual patient

Treatment
Emergency Medical Technician.
• Follow EMT Assessment and Treatment Guidelines (210.04)
• Follow Airway Guidelines (215.00)
  o Maintain aspiration precautions by placing the patient in the recovery position and protect the patient from injury
  o Administer 100% O2
• Determine BGL by finger stick
  o For patients who are exhibiting signs and symptoms of hypoglycemia, conscious and able to swallow, administer oral glucose or sugar orally for BGL less than 70 mg / dl
• If trauma suspected, follow Spinal Immobilization Guidelines (245.04)
• If the patient is actively seizing, protect the patient from further injury

Paramedic.
• Airway / breathing management
  o Follow Airway Guidelines (215.00)
    ▪ Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
• Determine BGL by finger stick, if not previously obtained
• Follow Vascular Access Guidelines (220.00)
• Initiate cardiac monitoring; record and evaluate ECG strip

Specific treatment situations are listed on the following page.
Specific treatment situations.

- **Symptomatic Hypoglycemia**
  - Thiamine 100 mg IV / IO / IM to all alcohol syndrome and malnourished patients prior to D50W administration
  - D50W 12.5 gm IV / IO for BGL less than 70 mg / dl
    - Repeat BGL by finger stick in 5 minutes
      - If no improvement and BGL is below 60 mg / dl repeat D50W 12.5 grams
    - Repeat BGL by finger stick after 15 minutes

- **Status Epilepticus / active seizures**
  - Note: Patients in status epilepticus should be treated aggressively
  - Valium 2 to 10 mg IV / IO / IM / PR for active seizures
    - To exceed maximum dose contact the receiving facility

- **Unknown etiology**
  - Consider other treatable neurological (traumatic or medical) or metabolic disorders and if identified follow the appropriate guideline
    - Assess temperature, 12 Lead ECG, SpCO, etc.
  - If the etiology of the seizure is unknown or suspected to be induced by exposure to narcotics, administer Narcan 0.5 mg IV
    - If no change in 5 minutes, administer a second dose of Narcan 0.5 mg IV. May repeat to a total dose of 4 mg.
Allergic Reaction / Anaphylaxis (230.10)
(Page 1 of 2)

Treatment will be guided by the degree of distress. Ordinary allergic reactions require minimal intervention but must be monitored for symptom progression. The patient who presents with respiratory compromise and shock should be treated for anaphylactic shock.

Assessment
- Exposure, ingestion or contact (e.g., stings, drugs, foods, etc.)
- Medical History
  - Medical illnesses
  - Medications
  - Allergies

Signs and Symptoms
- **Mild**
  - Anxiety
  - Itching
  - Localized swelling
  - Rash
  - Redness
  - Urticaria (hives)
- **Moderate**
  - All of the above and...
  - Abdominal pain
  - Combativeness
  - Cough
  - Lethargy
  - Nausea / vomiting
  - Tachycardia
  - Weakness
  - Wheezing
- **Severe**
  - All of the above and...
  - Hoarseness
  - Hypoperfusion (caused by vasodilation)
  - Inadequate respirations (tidal volume and / or rate)
  - Skin
    - Pale
    - Cool
  - Stridor
  - Tongue and / or upper airway (uvula) edema
  - Upper airway noise
  - Unresponsive
Allergic Reaction / Anaphylaxis (230.10)
(Page 2 of 2)

Treatment

Emergency Medical Technician.
- Anticipate rapid transport in the setting of anaphylaxis
- Assist with administration of patient’s Auto-Injector Epinephrine if present
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
  - Follow Hypotension / Shock Medical Guidelines (230.12) if indicated

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip

Reaction specific treatment situations.
- Mild reaction
  - Benadryl 25 to 50 mg IV, over 2 to 5 minutes
    - May be administered IM if no IV access available
- Moderate reaction
  - Complete the above treatment (concurrently if possible)
  - Albuterol 2.5 mg and Atrovent 0.5 mg
    - May repeat albuterol as needed (do not repeat Atrovent)
  - Anticipate rapid deterioration
  - If unsatisfactory response or clinical judgment indicates that the patient will not respond quickly to the treatments above then, follow BiPAP Guidelines Special Treatment Situations (215.00)
    - Continue above treatments while utilizing the CPAP device
- Severe reaction
  - Complete the above treatments (concurrently if possible)
  - Anticipate rapid deterioration and the need to intubate
  - Epinephrine 1:1,000 0.3 to 0.5 mg SQ / IM
- Anaphylactic Shock
  - Complete the above treatments (concurrently if possible)
  - Be prepared to intubate
  - Epinephrine 1:10,000 0.3 to 0.5 mg IV / IO
  - Follow Hypotension / Shock Medical Guidelines (230.12)
  - Initiate transport. Perform focused history and detailed physical examination en route to the hospital, if patient status and management of resources permit.
  - Reassess patient frequently
The **most important goal** in the pre-hospital management of shock is the diagnosis and immediate treatment of **underlying cause**.

### Treatment

**Emergency Medical Technician.**
- Anticipate rapid transport
  - Perform focused history and detailed physical examination en route if able.
- Determine underlying cause(s) of shock
- Follow [EMT Assessment and Treatment Guidelines (210.04)]
- Follow [Airway Guidelines (215.00)]
  - Administer 100% O2
- Maintain body warmth
- Place patient in Shock position (elevate lower legs 8-12 inches)

**Paramedic.** *Distributive (anaphylaxis, neurogenic, septic), post-resuscitative, stroke (or mimic), toxic, venomous bites / stings shock treatments follow these general guidelines.*
- Airway / Breathing Management
  - Follow [Airway Guidelines (215.00)]
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow [Vascular Access Guidelines (220.00)]
  - Establish large bore vascular access using the appropriate IV / IO route
  - Continue vascular access attempts en route to the hospital
  - Do not delay transport of the unstable patient more than two minutes
  - Fluid challenge, if indicated
    - See specific treatment situations for cardiogenic and hypo / hyperthermia.
- Infuse **Dopamine 5 to 20 mcg / kg / min** and titrate to maintain a systolic BP of 90 mmHg
  - See specific treatments for [Atraumatic Hemorrhagic / Hypovolemic Shock](#)
- Initiate cardiac monitoring; record and evaluate ECG strip
- Initiate transport
- Reassess the patient frequently

### Specific treatment situations.

**Atraumatic Hemorrhagic / Hypovolemic Shock** *(e.g., rectal / vaginal / GI bleeding)*
- Vasopressors are NOT INDICATED for treatment of hemorrhagic shock unless cardiogenic, obstructive or distributive causes are also present

**Cardiogenic Shock** *(AMI / CHF)*
- Volume expansion may cause fluid overload (auscultate the chest frequently)

**Environmental**
- Hypothermia
  - Fluid challenge, if indicated using **warm NS**
- Hyperthermia
  - Fluid challenge, if indicated using **ambient temperature NS**
Hyperthermia (230.14)
(Page 1 of 3)

Assessment
- Activity level (exercise induced?)
- Age
- Air temperature, humidity
- Clothing (bunker gear)
- Drug or alcohol use
- Medical History
  - Medical illnesses (including previous heat related emergencies)
  - Medications
  - Allergies
- Obesity
- Onset and duration
- Trauma

Signs and Symptoms
Heat Cramps. (Painful spasms of the extremities or abdominal muscles caused by salt depletion)
- AOX 4
- Muscle cramps
- Normal vital signs
- Sweating
- Thirst

Heat Exhaustion. (Dizziness, light-headedness, headache and irritability caused by fluid / electrolyte loss, resulting in hypovolemia)
- AOX 4
- Cool clammy skin
- Chills
- Dizziness
- Headache
- Muscle cramps
- Nausea / vomiting
- Normal or slightly elevated temperature
- Pallor or flushing
- Rapid heart rate
- Weakness
Hyperthermia (230.14)
(Page 2 of 3)

Signs and Symptoms Continued

Heat Stroke. (Marked alteration in LOC and extremely high temperature (often above 104°F) with red / hot / dry skin caused by hypothalamic imbalance. If patient is making the transition from heat exhaustion to heat stroke their skin may still be wet and cool.)

- Altered consciousness
- Behavioral changes
- Coma
- Delirium
- Extremely high temperature (greater than 104°F)
- Headache
- Increased respiratory rate
- Moist or dry skin
  - May be sweating
- Nausea / vomiting
- Pallor or flushing
- Psychosis
- Rapid and strong pulse initially deteriorating to weak and thready
- Seizures
- Visual disturbances

Fever related to medical conditions.

- Altered consciousness
- Behavioral changes
- Delirium
- Psychosis
- Coma
- Seizures
- Rapid breathing
- Rapid heart rate
- Stiff neck
- Abnormal breath sounds (crackles, stridor, wheezing)
- Hot, dry skin
- Signs / symptoms of dehydration
Hyperthermia (230.14)
(Page 3 of 3)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Move patient to cooler environment
- See special treatment situations below

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
  - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Vascular Access Guidelines (220.00)
- Follow Hypotension / Shock Medical Guidelines (230.12)
- Initiate cardiac monitoring; record and evaluate ECG strip

Specific treatment situations.
- **Heat Cramps**
  - Oral fluids as tolerated
  - Sponge with cool water
- **Heat Exhaustion**
  - Patient transported in position of comfort
  - Remove clothing as appropriate
  - Sponge with cool water and fan
- **Heat Stroke**
  - Cold packs (neck, axillary region and groin)
  - Semi-Fowlers with head elevated to 30°
  - Sponge with cool water and fan
  - Rapid cooling (prevent shivering)
Hypothermia (230.16)
(Page 1 of 2)

Assessment
- Air / water temperature
- Drug or alcohol use
- History and timing of changes in mental status
- Length of exposure
- Medical History
  - Medical illnesses (e.g., cirrhosis, epilepsy, diabetes)
  - Medications
  - Allergies
- Wet or dry
- Wind

Signs and Symptoms
- Bradycardia
- Decreased respiratory rate common
- Extremity pain
- Hypotension
- Neurologic
  - Decreased level of consciousness
  - Coma
- Paresthesia (frostbite)
- Shivering (occurs between 89.6°F to 98.6°F)
- Vital Signs
  - Rectal temperature below 95°F is significant finding
- Skin
  - Evidence of local trauma (blanching, blistering)
  - Erythema of extremities, ears or nose

Treatment guidelines for hypotension is on the following page
Hypothermia (230.16)
(Please 2 of 2)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Determine temperature of patient, if possible
- Consider specific treatment situation treatments shown below

Paramedic.
- **ALS interventions have minimal effect in the hypothermic patient**
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Hypotension / Shock Medical Guidelines (230.12)
- Follow Vascular Access Guidelines (220.00)
- For pain management associated with frostbite contact Receiving Facility
- Initiate cardiac monitoring; record and evaluate ECG strip
  - If patient experiences arrhythmias, refer to the appropriate guidelines
- Reassess patient frequently

Specific treatment situations.
- **Generalized hypothermia**
  - Maintain supine position
  - Handle patient gently. Avoid rough movement and excess activity. The hypothermic heart is irritable; roughness may result in ventricular arrhythmias.
  - Re-warming is the priority
    - Protect against further exposure and wind chill; remove wet, cold or constricting clothing
    - Wrap patient in blankets to protect against heat loss
- **Localized hypothermia (frostbite)**
  - Handle injured part gently; leave uncovered
  - Do not allow injured part to thaw if chance exists for refreezing before arrival at the receiving facility
  - Maintain core temperature of patient with blankets
Headache (235.00)

There are a wide variety of headache etiologies requiring different degrees of intervention, however, the following treatment guideline will be the minimum standard. In the event the etiology is evident the treatment will include the following plus any additional treatments required according to the underlying etiology and these SOG’s.

Treatment

**Emergency Medical Technician.**
- Follow [EMT Assessment and Treatment Guidelines (210.04)](210.04)
  - Closely monitor blood pressure
- Follow [Airway Guidelines (215.00)](215.00)
  - Maintain aspiration precautions on patients with a decreased level of consciousness by placing the patient in the recovery position
  - Administer supplemental O2, maintain saturation between 95 and 100%

**Paramedic.**
- Airway / breathing management
  - Follow [Airway Guidelines (215.00)](215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow [Vascular Access Guidelines (220.00)](220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- Maintain a high index of suspicion for a neurological event (e.g., cerebral hemorrhage)
Assessment
- Assess patient per Century’s Stroke Alert Policy as detailed on the following page
- Onset and duration
- Patient location
- Sequence of deficits
- Head or neck trauma
- Seizures (any type)
- Medical History
  - Medical illnesses (especially diabetes, cardiovascular disease)
  - Medications
  - Allergies

Signs and Symptoms
- Confusion
- Headache (commonly associated with an intra-cerebral hemorrhage)
- Neurologic
  - Decreased level of consciousness
  - Impaired movement
  - Asymmetry of face and extremities
  - Tremors
  - Speech difficulty or slurred speech
- Seizures
- Skin
  - Diaphoresis
  - Pallor
- Vital Signs
  - Vary
  - Note: Hyperglycemia is related to decreased effectiveness of thrombolytics and increase in morbidity
- Other
  - Medical alert tag


Stoke Assessment, Treatment and Transport Guidelines (235.02)

(Century Ambulance Service’s Stroke Alert Policy

Treatment.

Emergency Medical Technician.

• Follow EMT Assessment and Treatment Guidelines (210.04)
• Follow Airway Guidelines (215.00)
  o Administer O2 as indicated
    ▪ If SpO2 less than 95%, administer O2 at 2 to 4 lpm via nasal cannula to maintain SpO2 at 95% or greater
    ▪ If room air SpO2 is 95% or greater, do not administer O2
• Place the patient in a position of comfort, with head of bed elevated to 30° if tolerated
• Obtain blood pressure in both arms
• Determine BGL by finger stick, if not previously obtained
• Complete “Florida Bureau of EMS Stroke Alert Checklist;” declare “Stroke Alert” if indicated
• Do not administer any oral medications
  o Hypotension (systolic BP less than 90 mmHg)
    ▪ Follow Hypotension / Shock Medical Guidelines (230.12)
      • Do NOT declare Stroke Alert

Paramedic.

• Airway / breathing management
  o Follow Airway Guidelines (215.00)
    ▪ If the patient is unable to protect their airway due to an altered level of consciousness, intubate or perform advanced airway control as indicated
    ▪ Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
• Initiate cardiac monitoring, record and evaluate ECG strip
• Record and evaluate 12 Lead ECG
  o Do not delay treatment or transport for 12 Lead ECG
• Follow Vascular Access Guidelines (220.00)
  o Establish IV on the unaffected side
    ▪ If unable to establish IV access and vascular access is required for medication administration (see below), IO site selection is not affected by limb paralysis
• Consider specific treatment situations
  o Symptomatic hypoglycemia (less than 50 mg / dl)
    ▪ With vascular access
      • D50W 12.5 grams. Repeat BGL by finger stick in 5 minutes.
      • If no improvement and BGL is below 60, repeat D50W 12.5 grams
  o Hypotension (systolic BP less than 90 mmHg)
    ▪ Follow Hypotension / Shock Medical Guidelines (230.12)
      • Do NOT declare Stroke Alert
Assess patient using the Florida Bureau of EMS Stroke Alert Checklist on the following page.

- Exclusionary criteria for thrombolytic therapy
  - Symptoms greater than 5 hours
  - Evidence of head trauma, seizures, atraumatic bleeding, or recent surgeries
- Uncontrolled hypertension and the use of anti-coagulants are not direct exclusions from thrombolytic therapy but are considerations for the emergency room physician and the neurologist. Issuance of Stroke Alert and transport to a Stroke Center should still occur.
- “Stroke Alert” should not be issued for a systolic blood pressure less than 90 mmHg

If patient meets stroke alert criteria and does not meet any of the exclusionary criteria then:

- Notify dispatch of the “Stroke Alert,” destination and ETA
- Initiate rapid transport to a designated Primary or Comprehensive Stroke Center
  - Consider a Comprehensive Stroke Center if time of onset is greater than 2 hours
    - Baptist Medical Center – Downtown, Jacksonville, FL
    - Halifax Health Medical Center, Daytona, FL
    - Mayo Hospital, Jacksonville, FL
    - UF Health Jacksonville, FL
    - UF Health at UF, Gainesville, FL
  - Consider a Primary Stroke Center if time of onset is 2 hours or less
    - Baptist Medical Center – Beaches, Jacksonville, FL
    - Baptist Medical Center – Nassau, Fernandina Beach, FL
    - Baptist Medical Center – South, Jacksonville, FL
    - Flagler Hospital, St. Augustine, FL
    - Florida Hospital Flagler, Palm Coast, FL
    - Memorial Hospital, Jacksonville, FL
    - North Florida Regional Medical Center, Gainesville, FL
    - Orange Park Medical Center, Orange Park, FL
    - St. Vincent’s Medical Center – Riverside, Jacksonville, FL
    - St. Vincent’s Medical Center – Southside, Jacksonville, FL
  - Consider ATU only if time will be saved (e.g., distance and travel time exceeds 25 minutes or the helicopter can be launched prior to rescue arrival)
  - A Stroke Alert patient may be transported to a receiving facility other than a comprehensive or primary facility under the following conditions:
    - Transport to a comprehensive or primary facility is impractical due to unforeseen events (MCI, natural disaster, or other catastrophic event, etc.)
    - If, after informing patient of the state guidelines, the patient still insists on transport to another facility, transport will proceed according their wishes
      - It will be documented in the ePCR Narrative that the Century Ambulance Service’s Stroke Alert Policies were explained to the patient and the patient verbalized understanding of the guidelines and refused transport to the trauma center.
      - The patient’s immediate condition is such that the patient’s life may be endangered if care is delayed by proceeding directly to a comprehensive or primary facility
Receiving Facilities
A receiving facility is one which is identified below in these guidelines and which meets the requirements of 64J-2.002 F.A.C.

Receiving Facilities
- Baptist Clay Emergency Center, Fleming Island, FL
- Baptist Medical Center Beaches, Jacksonville Beach, FL
- Baptist Medical Center Nassau, Fernandina Beach, FL
- Ed Fraser Memorial Hospital, MacClenny, FL
- Lake Butler Hospital, Lake Butler, FL
- Lake City Medical Center, Lake City, FL
- Madison County Memorial Hospital, Madison, FL
- Memorial Emergency Center Atlantic, Jacksonville, FL
- Memorial Emergency Center Julington Creek, St Johns, FL
- Putnam Community Medical Center, Palatka, FL
- Shands Lake Shore Regional Medical Center, Lake City, FL
- Shands Live Oak Regional Medical Center, Live Oak, FL
- Shands Starke Regional Medical Center, Starke, FL
- St. Vincent’s Medical Center Clay County, Middleburg, FL

The Florida Bureau of EMS Stroke Alert Checklist is located on the following page.
**Stroke Alert Checklist**

**Date & Times**

<table>
<thead>
<tr>
<th>Date</th>
<th>Dispatched</th>
<th>Patient’s Side</th>
<th>Transporting</th>
<th>Destination</th>
</tr>
</thead>
</table>

**Basic Data**

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Age</th>
<th>Gender</th>
<th>Witness Name</th>
<th>Witness Phone</th>
</tr>
</thead>
</table>

| Last Time Without Symptoms | |
| Blood Glucose (if possible) | |

**History**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Headache</td>
<td></td>
</tr>
<tr>
<td>Head Trauma at Onset</td>
<td></td>
</tr>
</tbody>
</table>

**Examination**

<table>
<thead>
<tr>
<th>✓ if Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subarachnoid Hemorrhage?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Prehospital Stroke Scale</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Stroke Alert Criteria**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of onset &lt; 5 hours?</td>
<td></td>
</tr>
<tr>
<td>Any abnormal finding on examination?</td>
<td></td>
</tr>
<tr>
<td>Deficit not likely due to head trauma?</td>
<td></td>
</tr>
<tr>
<td>Blood glucose &gt; 50? (if fingerstick possible)</td>
<td></td>
</tr>
</tbody>
</table>

Transport **ALL** Patients to nearest available “Stroke Center.”

If answer is **“Yes”** to **ALL** stroke alert criteria, call **“Stroke Alert”** & transport patient **Urgently**.

En route, perform more complete neuro assessment if time allows.
Cardiac Monitoring Guidelines

EKG’s are to be used on all patients going to a medical hospital, who have a history of (regardless of the current diagnosis or complaint) and / or currently are being treated for respiratory problems, cardiac problems or any other problem that might (or whose treatments might) have a cardiac effect on the patient. Cardiac monitoring must also be initiated in all situations where these MSOG’s require it. (e.g. chest pain, SOB, abdominal pain, AMS, etc.)

If there is an IV additive in place, with the exception of an antibiotic or TPN, the patient must be placed on the EKG monitor for the duration of the transport.

If the patient has received any kind of sedation or narcotic pain relief and is being transported to another medical hospital they must be placed on the EKG monitor for the duration of the transport. (e.g. Morphine, Ativan, Haldol, etc..)

*Note: In all cases where a cardiac monitor is utilized the “strip” MUST be uploaded to the ePCR. (If an error prevents a strip from being uploaded it must be notated in the narrative and a strips must be printed out and included in the paperwork.)*

Three (3) and Four (4) Lead EKG’s Placement.

Three and four lead EKG lead placement should be placed as shown below.

*Three lead ECG’s do not include an RL lead.*
12 Lead EKG Acquisition and Transmission

Indications.
- Acute dyspnea
- Chest pain
- Epigastric pain
- Palpitations
- Syncope
- Unexplained diaphoresis
- Unexplained hypotension

Required equipment.
- Zoll E Series “ALS” monitor
- Zoll E Series “V” leads connector cable
- ECG electrodes

Procedure for EMT and Paramedic.
1. Turn the on the monitor to the grey “monitor” mode
2. Attach the electrodes to the 4 lead cable
3. Place electrodes on the patient’s body above the clavicles and below the umbilicus as appropriate
4. Attach the “V” leads connector cable electrodes to the cable
5. Place the electrodes on the chest
   a. V1- 4th intercostal space, right parasternal
   b. V2- 4th intercostal space, left parasternal
   c. V4- 5th intercostal space, mid-clavicular
   d. V6- 6th intercostal space, mid axillary
   e. V3- between V2 and V4
   f. V5- between V4 and V6
6. Plug the “V” lead connector cable into the 4 lead hub
7. Press the 12 Lead soft key
8. Press the patient information “PT info” soft key
12 lead EKG Acquisition and Transmission Continued

9. Press the “Gender” soft key (1) and enter the gender as appropriate, press return when done
10. Press the “Age” soft key (2) enter the age as appropriate, press return when done
11. Press the “ID #” soft key (3) and enter the patient’s name, press the “Return” soft key (4) when done

12. Ask the patient to remain still for one minute
13. Press the “Acquire” soft key

14. If there is ST segment elevation and the ECG is going to be transmitted.
   o Follow 12-Lead Transmission Procedures on following page.

Removing the electrodes.
- Detach the wires from the electrodes, leave electrodes in place

Returning to service.
- Remove the “V” leads connector cable from the 4 lead hub
- Replace the cover for the “V” leads cable connection on the hub

Precautions.
- Do not cut any portion of the device / cables.

12-Lead transmission directions are detailed on the following page.
12 lead EKG Acquisition and Transmission Continued

* Read instructions entirely BEFORE starting the process to transmit*
**If not a “Test” transmission, acquire the 12 Lead prior to beginning this workflow.**

Procedure
- Connect monitor USB / Serial cable to the toughbook (ensure both cord ends seated)

On Toughbook
- Open ZOLL Data Retreiver (located on the desktop)
- Click Connect Defib
- Click Set Patient Info
  - Enter patient and run information

On Monitor
- Turn dial to Monitor Mode
- Select 12-lead soft key
- Select Patient Information soft key
- Select Patient Record soft key

**For Actual Transmission**
- Select Transmit
- Select Xmit Now soft key

**Test Transmission**
- Skip this step
  - (It automatically selects the most recent 12 Lead.)

On Toughbook
- Click Undelivered 12-Lead
- Click Set Destination
- Click the appropriate destination from the list
  - If sending a test 12-lead, click “Test” as the destination
- Click Send Selected

After 12-lead Transmission Is Completed
- Click Disconnect Defib
- Click Close
Exernal Pacer

Indications
- Symptomatic bradycardia unresponsive to Atropine
  - Hypotension, acute altered mental status, chest pain, CHF, seizures, syncope
- Symptomatic bradycardia
  - Acute MI with a new bundle branch block
  - High degree (Mobitz II or 3rd degree) heart block
- Tachycardia refractory to drug therapy or cardioversion

Contraindications
- Asystole
- Severe hypothermia

Pacing procedures (**indicates a procedure the EMT can complete**)
1. *Expose patient’s chest; if necessary dry or clip excessive hair*
2. *Ensure ECG leads are properly placed*
3. *Place Multi Function Electrode (MFE) pads*
   - Preferred anterior / posterior position of chest walls just left of the sternum and spine, respectively
   - Acceptable apex and sternum if anterior / posterior not possible
4. Awake patients requiring pacing, may be given Versed 2 to 5 mg slow IV push, dose may be repeated every 5 minutes titrated to patient comfort
   - Beware of Versed effects on patient’s blood pressure
5. *Turn selector switch to PACER*

6. Set PACER RATE 10-20 ppm above the patient’s intrinsic rate (The heart rate unaided by an artificial pacemaker, expressed in beats per minute (bpm))
   - **Exception: If intrinsic rate less than 70, set at 70 ppm**
   - Increase / decrease captured rate to maintain a systolic BP of 90 mmHg
   - Increase / decrease rate in increments of 2 ppm by turning rate knob
Exernal Pacer
Pacing procedures continued.

7. Increase PACER OUTPUT mA (milliamperes) to the MAXIMUM setting and verify mechanical capture. *If mechanical capture is not obtained at the maximum setting the pacer can be disconnected and ignored for the remainder of the resuscitation.*
   - Decrease output in increments of 2 mA by turning output knob until electrical capture is lost.
   - Increase output (mA) gradually until electrical and then mechanical capture is established again and stop at that point.

- Determine electrical and mechanical capture as described below.
- **Electrical capture:** sufficient electrical current to stimulate the heart
  - An extended and sometimes enlarged T-wave appears
  - Each stimulus marked is followed by a wide QRS complex
  - Shape and size of ECG waveform varies (e.g. two examples shown below)
  - There is no underlying intrinsic rhythm

8. Mechanical capture: presence of a palpable pulse at a rate that approximates the rate displayed on the monitor
   - Only access the right brachial, right radial or either femoral site due to muscular contractions associated with pacing
Exernal Pacer Continued  
**Pacing procedures continued.**

9. To view underlying rhythm press and hold the 4:1 Mode button
   - Reduces the pacing stimulus to ¼ the ppm setting. Pressing the 4:1 button allows capture to be maintained.

10. Record, print and document ECG and present a copy to the ED medical staff
11. Thoroughly document pacing therapy and results in the PCR

**Alarm resolution.**

- Pacing alarms and displays “CHECK PADS or POOR PAD CONTACT”
  - MFE cable is not connected or is defective
  - MFE Pads are not connected to the Multi-Function cable
  - MFE Pads are not making good skin contact
- Correct the problem and press soft key below label “Clear Pace Alarm” to reset and silence the audible alarm
  - If the issue is resolved the alarm will remain silent
  - If the issue is NOT resolved the alarm will resume sounding after a few seconds
End Tidal CO2 (ETCO2) Monitoring

End Tidal CO2 levels should be monitored and recorded in all patients who are intubated or have complaints that merit CO2 monitoring.

- Century Ambulance Service uses main stream capnography
- The purpose of EtCO2 monitoring is to maintain or return the patient to normal EtCO2 values

**Indications**

- Intubated patients (mandatory)
- Severe respiratory distress

**Device assembly and use**

- Press “Wave 2” soft key on the cardiac monitor
  - Ensure monitor has had time to warm up. (approximately 2 minutes)
  - The words “WARM UP” will disappear once the device has finished warming up. (See below)

Insert the disposable airway adaptor into the CAPNOSTAT 5® sensor

- Place the adaptor between the E.T. tube and the BVM
  - If a ventilator is being used insert the adapter between the E.T. tube and the ventilator tube. (As close to the E.T. tube as possible)

The above procedure will enable the paramedic to view and monitor the ETCO2 waveform throughout the transport, troubleshoot any problems, and make any necessary changes to the treatment plan en route. (See the Ventilator and BiPAP Guidelines (215.00) for detailed troubleshooting and treatments)

A review of ETCO2 understanding and troubleshooting as well as some common waveforms are shown on the following pages.
Understanding EtCO2 numerical readings.

- Normal reading for a spontaneously breathing patient
  - 35 to 45 mmHg
- Respiratory arrest during CPR
  - 15 to 20 mmHg
- Cardiac / traumatic arrest during manual CPR
  - Approximately 15 mmHg (may be higher with the AutoPulse)
- Brain injury
  - Preferred EtCO2 reading for a patient with a brain injury (traumatic or pathologic)
  - 35 to 45 mmHg

Troubleshooting
- No EtCO2 reading
  - Ensure the device is properly assembled
  - Ensure ET tube is correctly placed
    - Direct visualization of the tube in the trachea
    - Presence of chest rise
    - Absence of gastric distention or gurgling sound
    - Absence of gastric contents in the ET tube
  - Kinked or obstructed ET tube
  - No EtCO2 production with CPR
    - Change compressors
    - Assess for lividity or rigor mortis (Refer to Dead on Scene Guidelines [210.02])
  - When is doubt treat the patient and do not rely on the monitor
- Lower than expected reading
  - Cardiac / traumatic Arrest
    - Perform CPR for 2 minutes with a fresh compressor
    - Decrease ventilation rate / volume
  - Respiratory Arrest
    - Check the airway adaptor for debris or fluid accumulation
    - Decrease ventilation rate / volume
- Higher than normal EtCO2 readings
  - Ensure supplemental O2 is being administered
  - Consider bronchospasm
  - Follow Respiratory Insufficiency Guidelines (215.04)
  - Increase ventilation rate / volume

Some commonly seen waveforms are reviewed on the following page
Waveform review.

Normal Waveform (Successful tracheal intubation).

Hyperventilation.

Hypoventilation.

Severe respiratory distress (asthma or airway obstruction)

Extubation, esophageal intubation, equipment problem, etc...
Chest pain / discomfort in this section relates to all cardiac related pain / symptoms regardless of the anatomical location.

**Assessment**
- Activity at the onset (e.g., rest, exercise, emotional stress, etc.) and relieving factors (e.g., NTG, antacids, etc.)
- Onset
- Provocation (Does anything make it worse?)
- Quality (e.g., pleuritic, heavy, crushing, etc.)
- Radiation and location
- Severity of pain / discomfort rating: 0 - 10 (0 = no pain, 10 = worst pain possible, unbearable)
- Time / duration
- Smoking
- Medical History
  - Especially cardiac or respiratory history (MI, respiratory disease, surgery, etc.)
  - Medical illnesses
  - Medications
  - Allergies

**Signs and Symptoms**
- Cardiac
  - Irregular pulse
- Chest wall tenderness
- Chills
- Clutching of chest
- Edema (peripheral: abnormal buildup of fluid in the ankles, feet and legs)
- Fever
- Nausea / vomiting
- Neck vein distention
- Numbness / tingling
- Respiratory
  - Cough and sputum production
  - Dyspnea (shortness of breath)
  - Sounds (Rales, rhonchi, wheezing, etc.)
- Skin
  - Color (cyanosis)
  - Moisture (diaphoresis, dry, normal)
- Vital Signs
  - Difference in BP between the two arms
  - Vary
Chest Pain / Discomfort (240.02)  
(Page 2 of 5)

Treatment

**Emergency Medical Technician.**
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer O2 as indicated
    - If SpO2 less than 95%, administer O2 at 2 to 4 lpm via nasal cannula to maintain SpO2 at 95% or greater
    - If room air SpO2 is 95% or greater, do not administer O2

**Paramedic.**
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Record and evaluate 12 Lead ECG:
  - Do not delay treatment or transport, but if possible no medications except O2 and aspirin should be given prior to the completion of the 12 Lead ECG
  - Receiving hospital must receive a hard copy of the 12 Lead ECG with the patient
  - If ST segment is elevated:
    - Complete “STEMI Alert” Criteria Checklist; declare a STEMI Alert
    - Transmit 12 Lead ECG to receiving facility
    - If Inferior MI is indicated (ST elevation in leads II, III, aVF) perform a “V4R” 12 Lead ECG
- Use nitroglycerin (NTG) with caution
  - Anticipate hypotension, maintain a systolic BP of 90 mmHg
  - Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Follow Vascular Access Guidelines (220.00)
  - If fluid challenge indicated use appropriate large bore route (IV / IO)
- Aspirin 324 mg PO unless contraindicated, must be chewed
- If not contra-indicated, give nitroglycerin (NTG) 0.4 mg SL every 5 minutes until one of the following occur:
  - The pain / symptoms are resolved
  - Systolic BP drops below 90 mmHg
  - A drop in the systolic BP of 20 mmHg or more, consider withholding repeat doses
  - Caution: Watch for increased vasodilation / hypotension in patients who have used erectile dysfunction medications within 72 hours preceding NTG administration.
- If BP remains stable five (5) minutes after most recent nitroglycerine SL dose, apply nitroglycerine paste, ½” – 2” to the anterior chest wall
- Follow Pain Management Guidelines (225.00)
  - Caution: Watch for hypotension in volume depleted patients, patients with decreased systemic resistance, and patients taking beta-blockers
Century Ambulance Service’s STEMI Alert Policy

Purpose.
To establish guidelines for activating a STEMI Alert in the pre-hospital setting

Goals.
The goal of this STEMI Alert policy is to decrease the amount of time elapsed from arrival at the emergency department to intervention in the cardiac catheterization lab. *Time is Tissue.*

The STEMI Alert is performed through a standardized approach to the care of cardiac patients. When done properly this should accomplish the following:

- Accurately identify acute infarct patterns (ST Elevated MI – STEMI) with 12 Lead ECG’s performed in the field
- Decrease scene times
- **Transmission of 12 Lead ECG**
- Provide early hospital notification and concise radio report
- Prepare the patient to the fullest extent possible for a seamless hand off of patient care
- Ensure that treatment and medication are provided as appropriate

Indications.
Paramedics should consider issuing a STEMI Alert when treating patients presenting with the following:

- Active chest pain / discomfort consistent with Acute Coronary Syndrome
  **OR**
- Symptoms consistent with Acute Coronary Syndrome – (Syncope or near syncopal episode, dizziness, diaphoresis, nausea / vomiting)
  **AND**
- ST segment elevation of 1mm or more in two or more anatomically contiguous leads on the 12 Lead ECG
  o Preferably noted corresponding reciprocal depression in opposite or nearby leads on the 12 Lead ECG
  o New Left Bundle Branch Block (LBBB)
Procedures.

- Complete STEMI Alert Checklist
  - Information contained in the STEMI Alert Checklist shall also be relayed to the receiving hospital in order to facilitate the initiation of thrombolytic therapy in the ED and/or the pre-activation of the catheterization lab team
  - Ability of pre-hospital personnel to complete the checklist will depend on patient condition, estimated time of arrival (ETA) at the ED and other factors
  - Scene time should not be delayed, nor should completion of the checklist interfere with other patient care
  - Transmit 12 Lead ECG to receiving facility
  - Note time of transmission and document that time in the PCR

- Notify dispatch of “STEMI Alert,” destination, ETA and if 12 Lead ECG has been transmitted

- While en route to hospital
  - Communicate radio report providing the following:
    - Patient age and gender
    - Clinical findings including cardiac rhythm and/or 12 Lead ECG, if available
    - Pertinent medical history
    - Allergy to contrast dye
    - Taking Coumadin (warfarin)
    - Treatment
      - Ensure receiving facility has received the 12 Lead ECG

- Leave original 12 lead ECG with the attending physician along with the completed checklist

*The STEMI Alert Criteria Checklist can be found on the following pages*
Chest Pain / Discomfort (240.02)
(Page 5 of 5)

STEMI Alert Criteria Checklist

Patient Information.

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>DOB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline V / S</td>
<td></td>
</tr>
<tr>
<td>B / P</td>
<td>Pulse</td>
</tr>
</tbody>
</table>

Times.

<table>
<thead>
<tr>
<th>Dispatch</th>
<th>Patient Contact</th>
<th>12 Lead Alert</th>
<th>ED Arrival</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Criteria Checklist.

<table>
<thead>
<tr>
<th>Box</th>
<th>Complaint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active chest pain / discomfort consistent with an Acute Coronary Syndrome</td>
</tr>
<tr>
<td>2</td>
<td>Other classic symptoms consistent with an Acute Coronary Syndrome (e.g., syncope or near syncope, dizziness, diaphoresis, nausea / vomiting)</td>
</tr>
</tbody>
</table>

Terms of use for the above criteria box 1 and / or box 2 must be checked "Yes" in addition to one “Yes” check in box 3 to declare a STEMI Alert

<table>
<thead>
<tr>
<th>12 Lead Interpretation</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior MI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inferior MI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LBBB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmitted to ED</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
If patient assessment (including 12 Lead ECG) indicates an evolving AMI, follow Chest Pain guideline

**Treatment**

**Emergency Medical Technician.**
- Follow [EMT Assessment and Treatment Guidelines (210.04)](#)
- Follow [Airway Guidelines (215.00)](#)
  - Administer 100% O2

**Paramedic.**
- Airway / breathing management:
  - Follow [Airway Guidelines (215.00)](#)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Record and evaluate 12 Lead ECG
- Follow [Vascular Access Guidelines (220.00)](#)
- Palpate pulses to ensure monitored heart rate is accurate
  - If rate less than 60, follow [Symptomatic Bradycardia Guidelines (240.12)](#)

**Specific treatment situations.**

**Occasional PVC’s.**
- Usually require no treatment beyond 100% O2

**Symptomatic with Multi-Formed PVC’s, Couplets, Salvos or R-on-T.**
- **Lidocaine 1 mg / kg** IV / IO, then **0.5 mg / kg** IV / IO every 5 to 10 minutes until PVC’s resolve or to a **maximum of 3 doses**
  - If Lidocaine is successful at resolving the PVC’s, start **Lidocaine infusion at 2 to 4 mg / min**
Congestive Heart Failure (CHF) manifests itself over a broad range of symptoms from simple shortness of breath to complete respiratory failure. Therefore the severity of symptoms will dictate the degree of intervention. In patients with pulmonary edema who are in severe respiratory distress consider immediate BiPAP support. (Follow BiPAP Guidelines Special Treatment Situations)

Signs and Symptoms

- Anxiety
- Ascites
- Cardiac
  - Chest pain
  - Dysrhythmia
  - Hypertension
  - Jugular vein distension (JVD)
  - Tachycardia
  - Third heart sound (*A third heart sound may be difficult to detect over the sound of an engine or other loud ambient noise.*)
- Fatigue / weakness
- Respiratory
  - Cough (sometimes pink tinged)
  - Crackles
  - Orthopnea (SOB when lying supine)
  - Paroxysmal nocturnal dyspnea (severe SOB at night)
  - Dyspnea (shortness of breath)
  - Respiratory distress
  - Wheezes
- Skin
  - Diaphoresis (excessive sweating)
  - Pale
  - Peripheral edema

Treatment

**Emergency Medical Technician.**

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Place the patient in full Fowler’s position
Treatment Continued

Paramedic.

- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
    - If fulminating pulmonary edema or a sustained SpO2 less than 90% noted after O2 and NTG, immediately apply BiPAP support
      - Follow BiPAP Guidelines Special Treatment Situations (215.00)
      - If still no improvement assist ventilations and intubate
  - Follow BiPAP Guidelines Special Treatment Situations (215.00)
- Airway / breathing management
  - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
  - If fulminating pulmonary edema or a sustained SpO2 less than 90% noted after O2 and NTG, immediately apply BiPAP support
  - Follow BiPAP Guidelines Special Treatment Situations (215.00)
  - If still no improvement assist ventilations and intubate
- Initiate cardiac monitoring; record and evaluate ECG strip
- Evaluate and record temperature
  - Elevated temperature typically indicates pneumonia and Lasix is contraindicated
- Record and evaluate ECG
  - Do not delay treatment or transport, but if possible no medications except O2 should be given prior to the completion of the 12 Lead ECG
  - Receiving hospital must receive a hard copy of the 12 Lead ECG with the patient
- Follow Vascular Access Guidelines (220.00)
- Consider specific treatment situations
  - Systolic BP greater than 90 mmHg
    - NTG 0.4 mg SL every 5 min until the symptoms are resolved or the systolic BP drops below 90 mmHg
      - A drop in the systolic BP of 20 mmHg or more, consider withholding repeat doses
      - Caution: Watch for increased vasodilation and hypotension in patients who have used any erectile dysfunction medication within 72 hours of NTG administration.
    - Lasix 20 to 40 mg IV / IO
      - To repeat dose contact receiving facility
      - Lasix is contraindicated in the presence of fever
    - Morphine 2 to 4 mg IV / IO; with repeat doses of 2 mg IV / IO every 5 minutes until one of the following occur:
      - Pain or symptoms are resolved
      - Maximum dose of 10 mg is reached
      - Patient’s systolic BP drops to less than 90 mmHg
      - Respiratory depression becomes apparent
      - There is a change in mental status
      - Caution: Watch for hypotension in volume depleted patients, patients with decreased systemic resistance and patients taking beta-blockers
        - Systolic BP less than 90 mmHg (Cardiogenic Shock)
          - Fluid Challenge, if indicated
          - Dopamine 5 to 20 mcg / kg / min (titrate to systolic BP of 90 mmHg)
Hypertensive Urgency (240.08)
(Page 1 of 2)

Hypertensive Urgency (systolic BP greater than 220 mmHg and diastolic BP greater than 120 mmHg) can present with or without symptoms. The severity of symptoms will dictate the degree of intervention and care is limited to supportive treatment. If stroke or cardiovascular symptoms are present with an abnormally elevated BP refer to the appropriate guidelines.

Assessment
- Onset and duration
- Pre-eclampsia
- Drug or alcohol use
- Head trauma
- Medical History
  - Medical illnesses (e.g., diabetes mellitus, respiratory or cardiac disease, stroke / TIA)
  - Medications
  - Allergies

Signs and Symptoms
- Abdominal pain
- Cardiovascular
  - Distended neck veins
  - Pulmonary and / or extremity edema
- Dizziness
- Headache
- Neurologic
  - Decreased level of consciousness
  - Impaired movement
  - Asymmetry of face and extremities
  - Seizures
  - Unequal pupils
- Nose bleed
- Projectile vomiting
- Skin
  - Flushed / Pallor
  - Diaphoresis
- Speech difficulties
- Syncope
- Visual disturbances
- Vital Signs
  - Bounding pulse
  - Bradycardia
  - Hypertension
- Weakness
Hypertensive Urgency (240.08)
(Page 2 of 2)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer O2 as indicated
- Place the patient in semi-Fowler’s position or position of comfort

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Record and evaluate 12 Lead ECG
- Follow Vascular Access Guidelines (220.00)
- Consider administration of Nitroglycerin:
  - **Caution absolute contraindications to treatment with antihypertensives**
    - Acute MI
    - Unstable angina
    - CHF
    - Bradycardia
    - AV Blocks
    - Wheezing
    - Recent illegal drug use (specifically crack / cocaine)
  - **Caution: Relative contraindications to treatment with antihypertensives:**
    - Acute Stroke (Do not treat hypertension in suspected stroke patients)
      - Contact the receiving facility to confirm the order before treating
  - If not contraindicated
    - Administer Nitroglycerin spray / tablet SL every 5 minutes
    - Place 1” Nitroglycerin paste on chest
      - Remove Nitroglycerin paste if systolic BP drops to 140-150 mmHg.
Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow the AHA’s Tachycardia With Pulses Algorithm
  - If cardiac related chest pain / discomfort follow Chest Pain / Discomfort Guidelines (240.00)
- Record and evaluate 12 Lead ECG:
  - Do not delay treatment or transport, but if possible no medications except O2 and aspirin should be given prior to the completion of the 12 Lead ECG
  - The receiving hospital must receive a hard copy of the 12 Lead ECG with the patient
AHA’s Tachycardia With Pulses Algorithm
Source: American Heart Association, Inc.

Adult Tachycardia
(With Pulse)

1. Assess appropriateness for clinical condition. Heart rate typically ≥150/min if tachyarrhythmia.

2. Identify and treat underlying cause
- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry

3. Persistent tachyarrhythmia causing:
- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

4. Synchronized cardioversion
- Consider sedation
- If regular narrow complex, consider adenosine

5. Wide QRS? ≥0.12 second
- IV access and 12-lead ECG if available
- Consider adenosine only if regular and monomorphic
- Consider antiarrhythmic infusion
- Consider expert consultation

6. Yes
7. No

Doses/Details

Synchronized Cardioversion
Initial recommended doses:
- Narrow regular: 50-100 J
- Narrow irregular: 120-200 J biphasic or 200 J monophasic
- Wide regular: 100 J
- Wide irregular: defibrillation dose (NOT synchronized)

Adenosine IV Dose:
First dose: 6 mg rapid IV push; follow with NS flush. Second dose: 12 mg if required.

Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

Procainamide IV Dose:
20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.

Amiodarone IV Dose:
First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.

Sotalol IV Dose:
100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

* Century does not carry Amiodarone or Sotalol.
** If conscious, sedate with Valium 5 - 10mg IV / IO prior to cardioversion
*** For irregular wide complex tachycardia give Lidocaine 1 - 1.5mg / Kg over 1 - 2 min.
**** If complex converts with Lidocaine begin Lidocaine infusion 2 - 4 mg / min.
Symptomatic Bradycardia (240.12)
(Page 1 of 2)

Includes Atrial or Junctional Bradycardia and
1st, 2nd, or 3rd Degree Heart Blocks with Bradycardia

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Assess for reversible causes (e.g., drug overdose, hypoxia, etc.)

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Record and evaluate 12 Lead ECG:
- Follow Vascular Access Guidelines (220.00)
- Do not delay treatment or transport, but if possible no medications except O2 and aspirin should be given prior to the completion of the 12 Lead ECG
  - The receiving hospital must receive a hard copy of the 12 Lead ECG with the patient
- Follow the AHA’s Bradycardia With Pulse Algorithm
AHA’s Bradycardia With Pulse Algorithm
Source: American Heart Association, Inc.

Adult Bradycardia
(With Pulse)

1. Assess appropriateness for clinical condition. Heart rate typically <50/min if bradynhrhythmia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IV access
   - 12-Lead ECG if available; don’t delay therapy

3. Persistent bradynrrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. Monitor and observe

5. Yes
   - Atropine
     - If atropine ineffective:
       - Transcutaneous pacing OR
       - Dopamine infusion OR
       - Epinephrine infusion

6. Consider:
   - Expert consultation
   - Transvenous pacing

© 2010 American Heart Association

Doses/Details
Atropine IV Dose:
First dose: 0.5 mg bolus
Repeat every 3-5 minutes
Maximum: 3 mg

Dopamine IV Infusion:
2-10 mcg/kg per minute

Epinephrine IV Infusion:
2-10 mcg per minute
Ventricular Assist Device (240.14)
(Page 1 of 1)

Things to Know
A Ventricular Assist Device (VAD) is an electrically powered continuous (not pulsatile) pump that is implanted alongside a patient’s heart to assist in the pumping function and maintain perfusion. A VAD can either assist the left ventricle (LVAD), the right ventricle (RVAD) or both ventricles. Since the left ventricle is the main pumping chamber of the heart and the chamber most often damaged by coronary disease, LVAD’s are the most common.

In the past, a patient with a VAD was a heart transplant candidate and the VAD served as a temporary bridge until the patient could receive a transplant. Today, the VAD is being viewed as a form of treatment that may not include heart transplant depending on a variety of factors.

The VAD allows the patient the opportunity to leave the hospital and function with some degree of normalcy. Therefore it is possible for Century crewmembers to encounter these patients in the pre-hospital setting if they suffer a trauma or medical emergency or in the rare event the VAD malfunctions or is damaged becoming inoperative. VAD’s have proven to be reliable medical devices with rare incidents of mechanical failure.

Procedure for EMT and Paramedic
If confronted with a VAD
- Immediately transport the patient to either the hospital where device was implanted or to the nearest hospital if the life status of the patient appears in question
- **DO NOT** attempt to diagnosis or fix problems involving a LVAD
- If present, a caregiver may be capable of providing instructions related to procedures to follow during emergencies (e.g., CPR, defibrillation)
  - Without such instructions crews should refrain from performing CPR or defibrillating the patient (**Explanation of WHY NO CPR is given below.**)
- Contact receiving facility for advice

Be sure to document any actions taken with the VAD patient and include the name of the person / caregiver who provided instructions and what instructions they provided.

**WHY NO CPR OR SHOCK??**
Most protocols for CPR and countershock have a decision point based on presence or absence of a pulse, SAO2, and / or B / P. Since patients with a VAD may not have a pulse or detectable SAO2 / BP decisions for VAD patients are different. The reason we do not initiate CPR without a caregiver providing instruction is because:
- Most of these devices are implanted in the lower chest or upper abdomen and are pretty large (softball sized or larger). **Vigorous CPR will damage / dislodge the device--a catastrophic outcome**
- They are electrically driven. D / C shock may well disrupt the drive for the device
- The absence of a pulse, SAO2 / BP reading does not mean there is no blood flow

Though it is counter to everything EMT’s and paramedics have been taught, **simply package and transport** (and make sure the patient is "plugged in" as electrical power is their lifeline).
Cardiac Arrest (240.16)
(Page 1 of 5)

Cardiac Red is a code term used to describe a situation where the patient is in respiratory and/or cardiac arrest thus requiring immediate resuscitation or if, without rapid intervention, the patient may deteriorate to the point where resuscitation is required.

*Note: If patient has a ventricular assist device (VAD) in place do NOT follow the cardiac arrest guidelines. Instead see the Ventricular Assist Device Guidelines (240.14).*

**Treatment**

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
  - Consider Dead on Scene Criteria (210.12)
  - Declare “Cardiac Red”
- Follow Airway Guidelines (215.00)
  - Ventilate via BVM with 100% O2
- Follow the AHA’s BLS Healthcare Provider Algorithm until ALS unit arrives at which point the Modified Pulseless Arrest Algorithm will be followed
- Attempt to ascertain patient complaint, illness or injury prior to the arrest in order to identify and treat possible causes
- **Remember current AHA standards emphasize the importance of:**
  - Good aggressive BLS with continuous CPR as indicated
  - Minimizing interruptions in CPR, (interruption no more than 10 seconds)
  - *Constantly monitor adequacy of compressions by assessing carotid/femoral pulses*
  - Unwitnessed arrest - Perform 2 minutes of CPR prior to any other intervention
  - Assessment / defibrillation by an AED / Defibrillator
  - Witnessed arrest - Immediate defibrillation
  - Adequate ventilations with BVM and 100% O2

Paramedic.
- Follow the Modified Pulseless Arrest Algorithm contained in these protocols; move to other algorithms if patient assessment dictates
- Follow Vascular Access Guidelines (220.00)
  - If fluid challenge indicated use appropriate large bore route (IV / IO)
- Follow appropriate algorithm (referenced above) for pharmacology and doses
  - Follow all IV / IO drug administrations with a 10 mL bolus of NS
- Follow Airway Guidelines (215.00)
  - Intubate or perform advanced airway control after above are completed (can occur concurrently as long as above are done first and additional experienced providers are available). Do not stop chest compressions to establish an airway.
  - Constantly monitor adequacy of ventilation by:
    - Auscultating the epigastrium and then the lung fields
    - CO2 monitoring (numerical and wave form)
    - Assessing chest rise
Specific ALS Treatment Considerations

V-Fib / Pulseless V-Tach.

**Emergency Medical Technician.**
- Follow [EMT Assessment and Treatment Guidelines](#) (210.04)
- Follow [Airway Guidelines](#) (215.00)
  - Ventilate with 100% O2
- If on a BLS unit, follow the **AHA’s BLS Healthcare Provider Algorithm**
- If assisting an ALS unit, follow the **Modified Pulseless Arrest Algorithm’s V-fib / V-Tach branch.**

**Paramedic.**
- Follow [Cardiac Arrest Guidelines](#) page one (1)
- Follow the **Modified Pulseless Arrest Algorithm’s V-fib / V-Tach branch.**

Asystole / Pulseless Electrical Activity.

**Emergency Medical Technician.**
- Follow [EMT Assessment and Treatment Guidelines](#) (210.04)
- Follow [Airway Guidelines](#) (215.00)
  - Ventilate with 100% O2
- If on a BLS unit, follow the **AHA’s BLS Healthcare Provider Algorithm**
- If assisting an ALS unit, follow the **Modified Pulseless Arrest Algorithm’s Asystole / PEA branch.**
- Continue CPR

**Paramedic.**
- Confirm asystole in more than one lead
- Follow [Cardiac Arrest Guidelines](#) page one (1)
- Follow the **Modified Pulseless Arrest Algorithm Algorithm’s Asystole / PEA branch.**
- If specific drug overdose is suspected, follow appropriate guideline
- Consider **Sodium Bicarbonate** 1 mEq / kg IV / IO:
  - **Contraindicated:** hypoxic lactic acidosis
  - Hyperkalemia and acidosis in dialysis patients who may have missed dialysis
  - If intubated and continued long arrest interval
  - Known pre-existing bicarbonate-responsive acidosis
  - Tricyclic antidepressant overdose
    - To alkalinate the urine in drug overdoses
AHA’s Healthcare Provider Algorithm
Source: American Heart Association, Inc.

Adult BLS Healthcare Providers

1. Unresponsive
   No breathing or no normal breathing (ie, only gasping)

2. Activate emergency response system
   Get AED/defibrillator
   or send second rescuer (if available) to do this

3. Check pulse: DEFINITE pulse within 10 seconds?
   - Definite Pulse
   - High-Quality CPR
     • Rate at least 100/min
     • Compression depth at least 2 inches (5 cm)
     • Allow complete chest recoil after each compression
     • Minimize interruptions in chest compressions
     • Avoid excessive ventilation
   - No Pulse

4. Begin cycles of 30 COMPRESSIONS and 2 BREATHS

5. AED/defibrillator ARRIVES

6. Check rhythm
   Shockable?
   - Give 1 shock
   - Resume CPR immediately for 2 minutes

7. Shockable
   - Give 1 shock
   - Resume CPR immediately for 2 minutes

8. Not Shockable
   - Resume CPR immediately for 2 minutes
   - Check rhythm every 2 minutes; continue until ALS providers take over or victim starts to move

Note: The boxes bordered with dashed lines are performed by healthcare providers and not by lay rescuers

* Push hard and fast (100 / minute) and release chest completely
** Rotate compressor every two (2) minutes during pulse / rhythm check.
Modified Pulseless Arrest Algorithm
Source: American Heart Association, Inc.

Adult Cardiac Arrest
Shout for Help/Activate Emergency Response

1. Start CPR
   - Give oxygen
   - Attach monitor/defibrillator

2. Rhythm shockable?
   - Yes
   - VF/VT
   - Shock
   - CPR 2 min
     - IV/IO access
   - Rhythm shockable?
     - Yes
     - Shock
     - CPR 2 min
       - IV/IO access
       - Epinephrine every 3-5 min
       - Consider advanced airway, capnography
     - Rhythm shockable?
       - Yes
       - Shock
       - CPR 2 min
         - IV/IO access
         - Epinephrine every 3-5 min
         - Consider advanced airway, capnography
       - CPR 2 min
         - Amiodarone
         - Treat reversible causes

3. Asystole/PEA

4. CPR 2 min
   - IV/IO access
   - Consider advanced airway, capnography

5. CPR 2 min
   - Epinephrine every 3-5 min
   - Consider advanced airway, capnography

6. CPR 2 min
   - Amiodarone
   - Treat reversible causes

7. Rhythm shockable?
   - Yes
   - Shock
   - CPR 2 min
     - IV/IO access
     - Epinephrine every 3-5 min
     - Consider advanced airway, capnography

8. CPR 2 min
   - IV/IO access
   - Epinephrine every 3-5 min
   - Consider advanced airway, capnography

9. CPR 2 min
   - IV/IO access
   - Epinephrine every 3-5 min
   - Consider advanced airway, capnography

10. CPR 2 min
    - IV/IO access
    - Epinephrine every 3-5 min
    - Consider advanced airway, capnography

11. CPR 2 min
    - IV/IO access
    - Epinephrine every 3-5 min
    - Consider advanced airway, capnography

12. If no signs of return of spontaneous circulation (ROSC), go to 10 or 11
    - If ROSC, go to Post–Cardiac Arrest Care

© 2010 American Heart Association

CPR Quality
- Push hard (≥2 inches [≥5 cm]) and fast (≥100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
  - If PETCO2 < 10 mm Hg, attempt to improve CPR quality
- Intra-arterial pressure
  - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abort sustained increase in PETCO2 (typically >40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Shock Energy
- Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J; if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy
- Epinephrine IV/IO Dose: 1 mg every 3-5 minutes
- Vasopressin IV/IO Dose: 40 units can replace first or second dose of epinephrine
- Amiodarone IV/IO Dose: First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Supraglottic advanced airway or endotracheal intubation
- Waveform capnography to confirm and monitor ET tube placement
- 8-10 breaths per minute with continuous chest compressions

Reversible Causes
- Hypovolemia
- Hypoxia
- Hypo- or hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

* Century does not carry amiodarone or vasopressin.
** ZOLL E Series® defibrillation doses are: Shock 1: 120J, Shock 2: 150J, Shock 3+: 200J
*** Treatment of H’s & T’s are detailed on the following page.
### H’s and T’s

<table>
<thead>
<tr>
<th>Potential Cause</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia (most common cause)</td>
<td>• Rapidly infuse NS at 20 mL / kg (up to a maximum or total infusion of 60 mL / kg) titrated to a systolic BP of 90 mmHg.  &lt;br&gt;• <em>Caution: Do Not Over Hydrate</em></td>
</tr>
<tr>
<td>Hypoxia</td>
<td>• Open / secure airway oxygenate &amp; ventilate if indicated  &lt;br&gt;• Follow Airway Guidelines (215.00)</td>
</tr>
<tr>
<td>Hydrogen ion – acidosis</td>
<td>• Hyperventilation  &lt;br&gt;• Sodium bicarbonate 1 mEq / kg IV / IO</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>• Sodium bicarbonate 1 mEq / kg IV / IO  &lt;br&gt;• Albuterol 2.5 mg via nebulizer</td>
</tr>
<tr>
<td>Hypokalemia</td>
<td>• In-hospital administration of potassium</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>• 12.5 grams D50W IV / IO  &lt;br&gt;• Follow Diabetic Emergencies Protocol (230.04)</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>• Active core rewarming</td>
</tr>
<tr>
<td>Toxins (drugs)</td>
<td>• Follow Toxic Ingestion / Exposure Guidelines (260.02)</td>
</tr>
<tr>
<td>Tamponade, cardiac</td>
<td>• Rapidly infuse 500 mL NS  &lt;br&gt;• (in-hospital pericardiocentesis)</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>• Follow Needle Thoracentesis Guidelines (215.08)</td>
</tr>
<tr>
<td>Thrombosis, coronary</td>
<td>• (in-hospital thrombolytics, cardiac catheterization)</td>
</tr>
<tr>
<td>Thrombosis, pulmonary (clot in lung)</td>
<td>• (in-hospital thrombolytics, embolectomy)</td>
</tr>
<tr>
<td>Trauma</td>
<td>• Follow appropriate trauma protocol</td>
</tr>
</tbody>
</table>
Post Resuscitative Care after Cardiac Arrest (240.18)

(Page 1 of 2)

Patients may display a wide range of responses to resuscitation from being awake and alert with adequate spontaneous respirations and hemodynamic stability to unconscious and NOT breathing with hemodynamic instability

Treatment

**Emergency Medical Technician.**
- Follow EMT Treatment and Assessment Guidelines (210.04) if not previously done
- Continue oxygenation / ventilation per Airway Guidelines (215.00)
  - Administer 100% O2

**Paramedic.**
- Reassess ABC’s
- Follow Airway Guidelines (215.00)
  - Keep intubated patient sedated in order to ensure a patent airway and eliminate patient agitation
- Follow Vascular Access Guidelines (220.00)
- Follow AHA’s Adult Immediate Post-Cardiac Arrest Care Algorithm
- CNS resuscitation A healthy brain is the primary goal
  - DO NOT warm patient; if found hyperthermic, keep cool, if possible
  - Control seizures / shivering with Valium 2 to 10 mg IV / IO; titrate to effect
    - To exceed maximum dose of 10mg contact the receiving facility
  - Seizures increase cerebral O2 requirements
  - Elevate the head approximately 30° to facilitate cerebral venous drainage and to decrease cerebral edema
- If the rhythm was converted with a bolus of Lidocaine
  - Use the pre-mix Lidocaine solution (contains 2 grams in 500 mL) with a 60 gtts / mL set
    - Rhythm converted with one dose = 30 gtts / min (2mg / min)
    - Rhythm converted with two doses = 45 gtts / min (3mg / min)
    - Rhythm converted with three doses = 60 gtts / min (4mg / min)

Specific treatment situation considerations are detailed on the following page.
Post Resuscitative Care after Cardiac Arrest (240.18)
(Page 1 of 2)

Treatment Continued

Specific treatment situation considerations.

- Hypotension
  - Follow Hypotension / Shock Medical Guidelines (230.12)

- V-Tach with a Pulse
  - Follow Tachycardia Guidelines (240.10)
  - Resume appropriate medication therapy starting at the last dose prior to conversion

- PVC’s indicate problems with the ABC’s, treatable H’s & T’s or high levels of catecholamines
  - If VF / VT precipitated the arrest and not previously administered
    - Lidocaine 1 mg / kg IV / IO initially, then 0.5 mg / kg every 5 to 10 min or until PVC’s resolve or to a maximum of 3 mg / kg
  - If Lidocaine is successful at resolving the PVC’s
    - Lidocaine infusion at 2 to 4 mg / min (see above)

- Tachycardia
  - Follow Tachycardia Guidelines (240.10)
    - Ensure that you continue drug dosing where you left off during the code for any drug previously administered

- Bradycardia is usually due to poor ventilation and oxygenation
  - Follow Symptomatic Bradycardia Guidelines (240.12) if associated with hypotension and hypoperfusion
AHA’s Adult Immediate Post-Cardiac Arrest Care Algorithm
Source: American Heart Association, Inc.

Adult Immediate Post-Cardiac Arrest Care

1. Return of Spontaneous Circulation (ROSC)

2. Optimize ventilation and oxygenation
   - Maintain oxygen saturation ≥94%
   - Consider advanced airway and waveform capnography
   - Do not hyperventilate

3. Treat hypotension (SBP <90 mm Hg)
   - IV/IO bolus
   - Vasopressor infusion
   - Consider treatable causes
   - 12-Lead ECG

5. Consider induced hypothermia

4. Follow commands?
   - Yes

6. STEMI OR high suspicion of AMI
   - Yes
   - Coronary reperfusion
   - No

7. Coronary reperfusion

8. Advanced critical care

© 2010 American Heart Association

*Century does not carry Norepinephrine*
**Therapeutic Hypothermia (240.20)**

*(Page 1 of 2)*

**Things to Know**

**Therapeutic hypothermia** is a medical treatment that lowers a patient’s body temperature to help reduce the risk of the ischemic injury to tissue following a period of insufficient blood flow. These periods of insufficient blood flow may be due to cardiac arrest or the occlusion of an artery by an embolism, as occurs in the case of a stroke.

These guidelines has been instituted to comply with the effort of the VA Hospital to provide therapeutic hypothermia to a patient in the event Return of Spontaneous Circulation (ROSC) is established post cardiac arrest. The Field Commander will be notified by dispatch of the impending run and they will facilitate getting the cooling unit in place and secured prior to transport. This call will have a third (3rd) crewmember on the unit to assist with patient care. *This treatment is not initiated by Century Ambulance Service, but is maintained with the use of equipment from the Lake City VA Medical Center.*

**Therapeutic hypothermia transports require an “X” response to and from the transferring facility.**

Please make sure of the following prior to transport:

- *An equipment loaner form must be filled out prior to and again after the transport.*
  - The patient must be successfully intubated or have an airway device in place.
  - The patient’s clothing has been removed and cooling blankets are in place.
  - The patient’s core temperature is documented *prior to departure* to establish a baseline.
  - Two (2) large bore IV’s (18 gauge or greater) are established or a central line is in place.
    - If only one large bore IV is available and no central line has been obtained, *do not delay transport.* (Attempt to gain access during transport.)
  - The time and amount of the patient’s last dose of *Demerol* has been documented.
    - *Patients are given large doses of Demerol PTA to lower their shiver threshold.*
  - The patient is on a *Propofol* drip to maintain the patient’s sedation.
    - Maintain current rate of infusion unless instructed by physician to titrate.
  - A single dose of *Rocuronium* (a NMBD paralytic) will be administered to the patient just prior to departure to help prevent shivering.

**Treatment**

- Maintain systolic blood pressure > 90mm Hg to ensure adequate perfusion.
  - If the systolic pressure drops to < 90 mm Hg
    - *Dopamine 2 - 10 mcg / kg / min* (400mg in a 250ml bag of Normal Saline)
      - and titrated a therapeutic effect.
  - Continually monitor and reassess the patient throughout transport.
  - Check and document vitals, including core temperature, every 10 minutes.
    - Post-arrest induced hypothermia target temperatures are 32°C - 34°C (89°F - 93°F)
  - Handle patients gently to reduce risk of arrhythmia.
  - If loss of spontaneous circulation occurs, discontinue cooling and follow the *Cardiac Arrest Guidelines (240.16)*
  - *Follow shivering assessment and treatment guide on next page*
**Therapeutic Hypothermia (240.20)**

(Page 2 of 2)

**Shivering Assessment and Treatment**

The Bedside Shivering Assessment Scale (BSAS) and associated treatment guidelines as shown below will be used when assessing patients for shivering. Assess and document the patients vital signs and the BSAS score (notated as a comment) every ten (10) minutes. Also, document any treatment given in the narrative of the PCR as well as its associated BSAS score.

*Note: In order to maintain the hypothermic state of these patients, it is critical that shivering be controlled.*

The BSAS score is measured by palpating the temple, masseter (jaw muscle in front of and just below the ear), neck and shoulder, pectoralis, bicep, and quadricep muscles.

<table>
<thead>
<tr>
<th>Score</th>
<th>Shivering</th>
<th>Location</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>No shivering noted on palpation of the masseter, neck or chest wall</td>
<td>None needed</td>
</tr>
<tr>
<td>1</td>
<td>Mild</td>
<td>Shivering is localized to the neck and / or thorax only</td>
<td>• Demerol 25mg IV every 5 minutes until shiver is suppressed or <strong>max total dose of 100mg</strong> is obtained</td>
</tr>
</tbody>
</table>
| 2     | Moderate  | Shivering involves gross movement of the upper extremities (in addition to neck and thorax) | • Demerol 25 - 50mg IV every 5 minutes until shiver is suppressed or **max total dose of 100mg** is obtained.  
• Versed 2.5mg with the first dose of **Demerol** |
| 3     | Severe    | Shivering involves gross movements of the trunk and upper and lower extremities | • Demerol 50mg IV and a repeat dose once if needed in 5 minutes.  
• Versed 2.5 - 5mg with the first dose of **Demerol** |

*Note: If shivering continues after this treatment regimen has been followed, contact medical control for further interventions.*

Upon arrival to the accepting facility the patient is to be unhooked from the cooling machine prior to leaving the unit. This machine is **NOT** to be removed from the ambulance until you have arrived back at the Lake City VA ED. At that time the cooling machine should be unloaded and turned back into the ED staff. **An equipment loaner form must be filled out and scanned with the rest of the paperwork.** Make sure all parties (Crew and VA staff) have signed for the equipment. It should never be left or taken without signatures.
Service Description
Century Ambulance Service, Inc. is a state licensed Advanced Life Supports (ALS) provider of pre-hospital emergency and inter-facility transports.

Communication Procedures
For each request for service, Century’s dispatch center (dispatch) shall obtain the minimum amount of information required to dispatch the call:
  - Address or location of the incident
  - Type of location (facility, house, apartment, street or highway, etc.)
  - Nature of emergency
    - Number of patients
    - Type and severity of injury(s)
  - Complainant’s name and phone number

Emergency Inter-facility Transfers
Century provides inter-facility and intra-facility emergency medical service transfers of trauma alert patients within thirty (30) minutes of the request for service. This is accomplished via formalized dispatch procedures (outlined in Century’s Dispatch SOG’s) as follows:

All EMERGENCY, IMMEDIATE, NICU, and PICU calls must be processed and dispatched within one (1) minute 90% of the time. The director of communications will monitor this performance measure. Call processing will be according to the following process:
  - Obtain the minimum pertinent information required as previously described above
  - Notify the primary dispatcher of the transport and pertinent information so that they can immediately contact the appropriate response unit and verbally dispatch them
  - Follow the General call processing guidelines

Note: If extenuating circumstances prevent Century from meeting the stated thirty (30) minute response requirement the dispatcher will advise the caller of the ETA to allow for sending facility to arrange transport services from another EMS agency.

Outside Agency Assistance. While at the scene of an emergency the crew may request assistance from other emergency response agencies (Air Transport Unit, law enforcement, other EMS agencies, etc.) by contacting dispatch via radio or telephone. Dispatch will forward the request to the appropriate agency and advise on-scene personnel of the disposition of the request and ETA of the required agency.

Pre-hospital Procedures
Upon arrival at the location of an incident involving trauma or potential trauma, the EMT and / or Paramedic shall assess the condition of each trauma patient using the Trauma Scorecard Methodology as outlined in 64J-2.004 F.A.C. for adults and 64J-2.005 F.A.C. for pediatrics to determine if the patient meets “Trauma Alert” criteria. Transport destination of trauma patients shall be determined by this assessment.
Assessing Adult Trauma Patients
The EMT and / or Paramedic shall assess all adult trauma patients using the following Trauma Scorecard Methodology in the order presented. If **any one** (1) of the following conditions is identified, the patient shall be considered a Trauma Alert patient:

- **Airway** - The patient receives active airway assistance beyond the administration of O\textsubscript{2}
- **Circulation** - The patient lacks a radial pulse with the sustained heart rate greater than 120 beats per minute or has a systolic blood pressure of less than 90 mmHg
- **Best Motor Response (BMR)** - The patient exhibits a score of four or less on the motor assessment component of the *Glasgow Coma Scale*; or exhibits the presence of paralysis; or there is the suspicion of a spinal cord injury or the loss of sensation
- **Burn / Cutaneous** - The patient has 2\textsuperscript{nd} or 3\textsuperscript{rd} degree burns to 15% or more of the total body surface area; or amputation proximal to the wrist or ankle; or any penetrating injury to the head, neck or torso (excluding superficial wounds where the depth of the wound can be determined)
- **Longbone Fracture** - The patient reveals signs or symptoms of two or more longbone fracture sites (humerus, radius, ulna, femur, tibia or fibula)

Should the trauma patient not be identified as a Trauma Alert using the previous criteria, they shall be further assessed using the following criteria and shall be considered a Trauma Alert patient when a condition is identified from **any two** (2) of the components included below:

- **Airway** - The patient has a respiratory rate of 30 or greater
- **Circulation** - The patient has a sustained heart rate of 120 beats per minute or greater
- **BMR** - The patient has a BMR of 5 on the motor component of the *Glasgow Coma Scale*
- **Cutaneous** - The patient has soft tissue loss of from either a major degloving injury or a major flap avulsion greater than 5 inches; or has sustained a gunshot wound to the extremities of the body
- **Longbone Fracture** - The patient reveals signs or symptoms of a single longbone fracture resulting from a motor vehicle collision or a fall from an elevation of 10 feet or greater
- **Age** - The patient is 55 years of age or older
- **Mechanism of Injury** - The patient was ejected from a motor vehicle (excluding: motorcycle, moped, all-terrain vehicle, bicycle, or the open body of a pick-up truck); or the driver of the motor vehicle impacted the steering wheel causing steering wheel deformity

If, after evaluating the patient using the previous criteria, the patient is not identified as a Trauma Alert patient, they will be evaluated using all elements of the *Glasgow Coma Scale* (GCS). If the patient’s score is **12 or less**, the patient shall be considered a Trauma Alert patient (excluding patients whose normal *Glasgow Coma Scale* score is 12 or less, as established by the patient’s medical history or preexisting medical condition when known).

If the patient meets none of the aforementioned Trauma Alert criteria, the EMT or Paramedic can call a Trauma Alert if, in his or her judgment, the patient’s condition warrants such action. Where EMT or Paramedic judgment is used as the basis for calling a Trauma Alert, it shall be documented as required in section 64J-2.002(5) F.A.C.
Assessing Pediatric Trauma Patients
Trauma patients with the anatomical and physical characteristics of a person fifteen years of age or less will be assessed as pediatric patients using the following Trauma Scorecard Methodology. If any one (1) of the following conditions are identified, the patient shall be considered a pediatric Trauma Alert patient:

- **Airway** - In order to maintain optimal ventilation, the patient is intubated; or the patient’s breathing is assisted through such measures as manual jaw thrust, continuous suctioning, or through the use of other adjuncts to assist ventilatory efforts.

- **Circulation** - The patient has a faint or non-palpable carotid or femoral pulse; or the patient has a systolic blood pressure of less than 50 mmHg.

- **Consciousness** - The patient exhibits an altered mental status that includes drowsiness, lethargy, the inability to follow commands, unresponsiveness to the voice, totally unresponsive, or is in a coma; or there is the presence of paralysis, the suspicion of a spinal cord injury, or a loss of sensation.

- **Fracture** - There is evidence of an open longbone (humerus, radius, ulna, femur, tibia, or fibula) fracture; or there are multiple fracture sites or multiple dislocation (except for isolated wrist or ankle fractures or dislocations).

- **Burn / Cutaneous** - The patient has a major soft tissue disruption including major degloving injury or major flap avulsion; or 2nd or 3rd degree burns to 10% or more of the total body surface area; or amputation proximal to the wrist or ankle; or any penetrating injury to the head, neck or torso (excluding superficial wounds where the depth of the wound can be determined).

Should the pediatric trauma patient not be identified as a Trauma Alert using the previous criteria, they shall be further assessed using the following criteria and shall be considered a pediatric Trauma Alert patient when a condition is identified from any two (2) of the components includes below:

- **Consciousness** - The patient exhibits symptoms of amnesia; or there is loss of consciousness.

- **Circulation** - The carotid or femoral pulse is palpable, but the radial or pedal pulses are not palpable; or the systolic blood pressure is less than 90 mmHg.

- **Fracture** - The patient reveals signs or symptoms of a single closed longbone fracture (does not include isolated wrist or ankle fractures).

- **Size** - Pediatric trauma patients weighing 11 kilograms or less, or the body length is equivalent to this weight on a pediatric length and weight emergency tape (the equivalent of 33 inches in measurement or less).

If the patient meets none of the aforementioned Trauma Alert criteria, the EMT or Paramedic can call a Trauma Alert if, in his or her judgment, the patient’s condition warrants such action. Where EMT or Paramedic judgment is used as the basis for calling a Trauma Alert, it shall be documented as required in section 64J-2.002(5) F.A.C.
Issuing a Trauma Alert
Upon determining that a trauma patient meets the appropriate Adult or Pediatric Trauma Scorecard Methodology criteria the patient will be classified as a Trauma Alert patient. The crewmember will issue a Trauma Alert using the words “Trauma Alert.”

Dispatch shall then notify the State-Approved Trauma Center (SATC) or receiving hospital that they will be receiving a Trauma Alert patient.

Documentation of Trauma Patients
The crew will provide required trauma information to the receiving facility in accordance with 64J-2.004 F.A.C. for adults and 64J-2.005 F.A.C. for pediatrics, and 64J-2.002(5) F.A.C. A field report and patient care record (PCR) will be completed as required in 64J-1.014(3) F.A.C.

Trauma Transport Destination Criteria

Transporting to SATC. All patients meeting Adult or Pediatric Trauma Scorecard Methodology will be transported by Century ground transport to a SATC nearest to the location of the incident.

When the lead crewmember of the scene deems that rapid transport is necessary (e.g., distance, severity of injury, traffic conditions, etc.) they shall consider an ATU.

State-Approved Trauma Centers (SATC)
- UF Health Jacksonville (Level I), Jacksonville, FL (Adult & Pediatric)
- UF Health Shands Hospital (Level I), Gainesville, FL (Adult & Pediatric)
- Orange Park Medical Center (Level I), Orange Park, FL (Adult)
- Halifax Medical Center (Level II), Daytona, FL (Adult)

Transporting To Other Than SATC. A Trauma Alert patient may be transported to a receiving facility other than a SATC under the following conditions:
- Transport to a SATC is impractical due to unforeseen events (MCI, natural disaster, or other catastrophic event, etc.)
- If, after informing patient of the state guidelines, the patient still insists on transport to another facility, transport will proceed according to patient’s wishes based on the Consent to Treat and Competency Guidelines (210.00).
  - This must be documented on the PCR.
  - It must be documented in the narrative that the Century Trauma Transport Guidelines were explained to the patient, the patient verbalized understanding of the guidelines and still refused transport to the trauma center.
- The patient’s immediate condition is such that the patient’s life may be endangered if care is delayed by proceeding directly to a SATC.
Receiving Facilities
A receiving facility is one which is identified in these guidelines and which meets the requirements of 64J-2.002 F.A.C.

Current regional receiving facilities include:
- Baptist Clay Emergency Center, Fleming Island, FL
- Baptist Emergency Center at Town Center, Jacksonville, FL
- Baptist Medical Center Beaches, Jacksonville Beach, FL
- Baptist Medical Center Jacksonville, Jacksonville, FL
- Baptist Medical Center Nassau, Fernandina Beach, FL
- Baptist Medical Center South, Jacksonville, FL
- Ed Fraser Memorial Hospital, MacClenny, FL
- Flagler Hospital, St. Augustine, FL
- Florida Hospital Flagler, Palm Coast, FL
- Lake Butler Hospital, Lake Butler, FL
- Lake City Medical Center, Lake City, FL
- Madison County Memorial Hospital, Madison, FL
- Mayo Hospital Jacksonville, Jacksonville, FL
- Memorial Emergency Center Atlantic, Jacksonville, FL
- Memorial Emergency Center Julington Creek, St Johns, FL
- Memorial Hospital Jacksonville, Jacksonville, FL
- North Florida Regional Medical Center, Gainesville, FL
- Park West ER, Jacksonville, FL
- Putnam Community Medical Center, Palatka, FL
- Shands Lake Shore Regional Medical Center, Lake City, FL
- Shands Live Oak Regional Medical Center, Live Oak, FL
- Shands Starke Regional Medical Center, Starke, FL
- St. Vincent’s Medical Center Clay County, Middleburg, FL
- St. Vincent’s Medical Center Southside, Jacksonville, FL
- St. Vincent’s Medical Center Riverside, Jacksonville, FL
- UF Health North, Jacksonville, FL

Medical Director Approval

I, David T Murray, M.D., Medical Director for the Century Ambulance Service, Inc., certify that I have reviewed and approved the Trauma Transport Guidelines updated May 9, 2016.

Signature on File

David T. Murray, M.D.
Medical Director
Trauma Scene Size Up and Assessments (245.02)
(Page 1 of 4)

Trauma Alerts should be recognized and dispatch notified to initiate interagency communication as early as possible after scene safety is considered. See the preceding Trauma Transport Guidelines (245.00) for guidelines regarding Trauma Alert other than the treatment guidelines listed in the following guidelines.

Scene Size Up and History
Every trauma scene size up should include the following:

- Description of scene (event, MVC, workplace, etc.)
- Time of injury
- Mechanism of injury (blunt or penetrating)
- Blunt trauma
  - Amount and direction of force
- Penetrating trauma
  - Size of object
  - Trajectory
  - Weapon (Caliber of bullet if applicable and available)
- Drug or alcohol use
- Motor Vehicle Collision (MVC)
  - Amount of intrusion
  - Condition of vehicle inside and out
    - Deformed dashboard / steering wheel indicate likely chest or abdomen trauma
    - Consider impact points and resulting forces in assessment decisions
  - Deployment of airbags
  - Helmet use and type
  - Patient trajectory
  - Seat belt use
  - Speed of impact
- Medical History
  - Previous injuries
  - Medical illnesses (Especially diabetes, seizures, etc.)
  - Medications
  - Allergies
- Treatment prior to arrival (patient movement by bystanders or self)
Assess Signs and Symptoms

Every trauma scene size up should include the following based on the severity and location of the injury and potential injuries:

- **Airway** (clear, partially obstructed, obstructed, etc.)
- **Breathing** (normal, labored, abnormal, apneic, etc.)
- **Circulation**
  - Pulse
  - Capillary refill
  - Hemorrhage
  - Blood pressure
  - Etc.
- **Skin**
  - Coloration
  - Temperature
  - Moisture
  - **DCAP-BTLS** (Deformities, Contusions, Abrasions, Punctures and penetrations, Burns, Tenderness, Lacerations, Swelling)

Note: If patient is determined to be a trauma arrest then proceed immediately to the **Trauma Treatments and Specific Considerations (245.06)**.

- **Neurological**
  - BGL (blood glucose level) if AMS is present
  - Posturing
    - Decorticate (body stiff with bent arms, clenched fists, and legs held out straight. The arms are bent in toward the body and the wrists and fingers are bent and held on the chest.)
    - Decerebrate (arms and legs being held straight out, the toes being pointed downward, and the head and neck being arched backwards. The muscles are tightened and held rigidly.)
  - Level of consciousness
    - Any loss of or decrease in consciousness and duration before and after accident
    - Onset of decreased level of consciousness if applicable
  - Amnesia to events
  - Ongoing short term memory loss
  - AVPU
  - Alert and oriented
    - Person
    - Place
    - Event
    - Situation
Neurological continued

- Comprehension, speech and repetition
  - TBI indicative aphasias
    - Wernicke’s (fluent speech but poor auditory processing and repetition)
    - Broca’s [intact auditory processing but poor ability to produce language (spoken or written)]
    - Conduction (intact auditory processing, fluent or paraphasic speech, and poor repetition)
    - Transcortical (intact or compulsive repetition, poor auditory processing, fluent AND paraphasic speech)

- Paralysis
- Sensation
  - Present
  - Absent
  - Tingling
- Seizures (before or after injury)

HEENT

- Head
  - Pain / tenderness
  - Trauma signs
  - Depressions
- Eyes
  - PERRLA
  - Dilopia (double vision) or blurred vision
  - Gaze
  - Raccoon / Black eyes (Bruising / edema around eyes)
  - Displacements indicating injury (internal or external displacement)
  - Damage
- Ears
  - Battle signs
  - Fluids (blood or spinal)
- Nose
  - Deformity
  - Crepitus
  - Fluids (blood, spinal, emesis, etc.)
- Throat (See neck below)
**Neck**
- Pain / tenderness
- Tracheal deviation (Late sign of chest trauma)
- Distended neck veins (Sign of chest trauma)
- Need for immobilization *(Immobilize immediately if potential spinal injury.)*

**Chest**
- Pain / tenderness
- Subcutaneous emphysema
- Chest wall movement [normal, paradoxical (flail segment), one sided, etc.]
- Crepitus (Consider location and underlying organ damage: spleen, liver, etc.)
- Sound
  - Lungs
    - Clear, crackles, rales, wheezing, absent (pneumothorax?), etc.)
  - Heart
    - Volume (loud, faint, absent, etc.)
    - Tone (clear, muffled, absent, etc.)
    - Regularity (regular, irregular, changes with breathing, etc.)

**Abdomen / pelvis**
- Pain / tenderness
  - Palpable pain
  - Guarding
- Specific contusions
  - Lap belt marks (intestinal rupture, hemorrhage)
  - Grey Turner sign / flank or umbilicus ecchymosis (Delayed sign of retroperitoneal hemorrhage)
- Consistency upon palpation
  - Distended
  - Rigid (blood induced peritonitis)
- Crepitus (Consider location and underlying organ damage: bladder, bowels, etc.)
- Pregnancy (Consider both mother and infant)
  - Term
  - Para / Gravida (births / pregnancies)
  - Contractions
- Bleeding from penis, rectum, or vagina
- Incontinence (Sign of spinal injury)

**Extremeties**
- Pain / tenderness
- Range of motion (ROM)
- Pulses
- Sensation
- Deformities / crepitus
- Leg shortening and / or rotation (Sign of hip / pelvis fracture)
Spinal Immobilization (245.04)

The treatment situations noted in these guidelines are those most commonly encountered and are not intended to encompass all possible scenarios requiring spinal immobilization; the guiding treatment principle is the well-being of the patient after ensuring crew and patient safety.

Indications

- Determining the need for spinal immobilization includes the following
  - Assessment of the mechanism of injury
  - Assessment of the patient’s complaints and overall condition
  - Assessment of the patient’s ability to recognize and accurately convey the presence of spinal injury symptoms
- Spinal immobilization should always be applied when any doubt exists as to the possibility of spinal trauma. If in doubt, immobilize!
- Spinal immobilization should be performed on patients with:
  - Any trauma with a defined neurological deficit or complaint
  - Complaints of neck and / or back pain after recent trauma
  - Decreased levels of consciousness or altered mental status of unknown etiology
  - Head, facial or cervical trauma
  - High voltage electrical injuries (excludes TASER® use)
  - Significant mechanism of injury, subjective complaints or objective findings suggestive of neck and / or back injury
  - Significant mechanism of injury who present with any evidence of alcohol or drug ingestion, distracting injury or inability to communicate
  - Sudden acceleration or deceleration injuries (e.g., auto / bicycle accidents, diving injuries, shallow water drowning, falls from any height, etc.)

- See blunt and penetrating trauma algorithms for immobilization determination workflow
  - The blunt trauma algorithm can be found on page 4 of this protocol.
  - The penetrating trauma algorithm can be found on page 4 of this protocol.

Refusals

If immobilization is indicated, but is refused by the patient the following must be done:

- Advise the patient of the indication(s) for spinal immobilization and the risks associated with refusing the immobilization
  - Risks include paralysis and / or death.
- If the patient continues to refuse immobilization
  - Apply a rigid cervical collar even if full immobilization is refused (patient permitting)
  - Maintain spinal alignment as best as can be achieved while transporting the patient
  - Clearly document the refusal of spinal immobilization in the PCR

Assistance

Request assistance from any available EMS personnel, firefighters, law enforcement officers or bystanders in securing and moving the patient. Maintain close supervision of activity by providing direction and standing at the head end of the patient.
Procedures for Specific Treatment Situations (EMT and Paramedic)

Patient found in sitting position in open space (e.g., sidewalk, roadside, etc.).
1. Apply and maintain manual in-line stabilization of patient’s head until full immobilization is achieved
2. Apply rigid cervical collar
3. Recline patient as a unit onto a long spine board (LSB)
4. Slide patient into position using the long axis of the body ensuring that the patient is centered on the LSB
5. Secure patient to LSB with straps
6. Place and secure CID, tape over the forehead; do not tape the chin

Patient found in an automobile and extrication not required.
1. Apply and maintain manual in-line stabilization of patient’s head until full immobilization is achieved
2. Apply rigid cervical collar
3. Position a LSB next to the open vehicle door to receive patient
   o Consider K.E.D. or short spine board with the stable patient
4. While maintaining manual stabilization, support and control the patient’s torso and legs while rotating the patient so that his / her back faces the open doorway
5. Recline patient as a unit onto LSB
6. Slide patient into position using the long axis of the body and ensure that the patient is centered on the LSB
7. Secure patient to LSB with straps
8. Place and secure CID, tape over the forehead; do not tape the chin

Patient found in an automobile and extrication IS required.
Perform rapid extrication procedure only when indicated by scene safety or deteriorating patient condition. Rapid extrication is a technique used to move a patient from a sitting position to a supine position on a backboard in less than one (1) minute. It is used when the patient has life threatening conditions or the scene is unsafe.
- After rapid extrication is completed immobilize the patient the same as a patient found lying supine on the ground listed on the following page.

Patient found standing / ambulatory (Standing Takedown).
1. Apply and maintain manual in-line stabilization of patient’s head until full immobilization is achieved
2. Apply rigid cervical collar
3. Position a LSB behind the patient against their back
4. Inform the patient that you will be lowering him / her backward
5. Slowly recline patient as a unit onto LSB
6. Ensure that the patient is centered on the LSB
7. Secure patient to LSB with straps
8. Place and secure CID, tape over the forehead; do not tape the chin

Procedures for specific treatment situations continued on following pages.
Procedures for Specific Treatment Situations Continued (EMT and Paramedic)

Patient found lying on ground.
1. Apply and maintain manual in-line stabilization of patient’s head until full immobilization is achieved
2. Apply rigid cervical collar
3. Follow the appropriate treatment based on how the patient was found as follows:
   a. **Patient is lying on their side**
      1. Slide the LSB behind the patient
      2. Log roll patient as a unit to a supine position onto LSB without compromising the integrity of the spine
      3. Ensure that the patient is centered on the LSB
      4. Secure patient to LSB with straps
      5. Place and secure CID, tape over the forehead; do not tape the chin
   b. **Patient is lying prone**
      1. Place LSB alongside patient
      2. Log roll patient as a unit to a supine position onto LSB without compromising the integrity of the spine
      3. Ensure that the patient is centered on the LSB
      4. Secure patient to LSB with straps
      5. Place and secure CID, tape over the forehead; do not tape the chin
   c. **Patient is lying supine**
      1. Place LSB alongside patient
      2. Log roll patient as a unit away from LSB and slide board under patient
      3. Log roll patient as a unit to a supine position onto LSB without compromising the integrity of the spine
      4. Ensure that the patient is centered on the LSB
      5. Secure patient with straps
      6. Place and secure CID, tape over the forehead; do not tape the chin

Special Considerations

- **Examination of the patient’s posterior should occur prior to application of the LSB**
- **Immobilizing the pregnant patient**
  - Immobilizing a third trimester pregnant patient may elicit Supine Hypotensive Syndrome from pressure on the inferior vena cava and may also impair ventilation as the fetus and uterus press against the diaphragm
  - After immobilization is complete and patient is secure, the right side of the LSB should be elevated approximately 15 degrees (approximately 6 inches), displacing the uterus and fetus to the left side and off of the inferior vena cava
  - If the LSB cannot be elevated, manually displace the uterus and fetus to the left without causing spinal movement and maintain displacement throughout transport
- **Immobilizing the obese patient**
  - Maintaining neutral alignment of the head and spine necessitates the use of blankets, towels or padding placed under the patient’s head to prevent hyperextension of the head and neck prior to immobilization
Special Considerations Continued

- **Immobilizing the pediatric patient**
  - Small children present unique challenges due to their anatomic differences and their inability to understand your intentions. Their heads are disproportionately larger than adults and protrude posteriorly which causes their neck to flex forward when placed in a supine position.
  - Children are easily frightened! Use developmentally appropriate language and a calm, reassuring voice to communicate your intentions.
  - Place padding between the LSB and the patient’s upper back / shoulders to maintain neutral alignment of the head, neck and torso.
  - Apply an appropriately sized rigid cervical collar. If not practical, use towel rolls and tape to immobilize the head.
    - Avoid tape over the chin because it may impair ventilation.
  - If the child’s size permits, utilize a pediatric immobilization device.
  - Place padding between the patient and the edge of the LSB to fill any voids and eliminate lateral movement.

Immobilization Algorithms

**Penetrating trauma algorithm.**

1. **Examples include unconsciousness, significant intoxication, dementia, etc.**
2. **Examples include numbness, focal weakness, focal sensory deficit, paresthesia.**
Immobilization Algorithms
  Blunt trauma algorithm.

3. Tenderness to the midline posterior neck and back, including the paraspinal musculature
4. Examples include numbness, focal weakness, focal sensory deficit, paresthesia.
5. Examples include long bone fractures, dislocations, large lacerations, degloving injuries, serious burns, or any other injury causing functional impairment
6. Examples include language barrier, hearing or speech impairment, and age (young children)
Trauma Treatments and Specific Considerations (245.06)
(Page 1 of 3)

Just as all trauma patients require a general scene size up and assessment, all trauma patients require a general treatment regimen be followed with specific considerations given in special situations.

Note: Trauma arrest and multi-system trauma patients are considered “Load and Go” patients. Limit scene time to 10 minutes or less. (Call 911 or have dispatch call 911 immediately if extrication is required.)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2 (By BVM if patient is not breathing adequately)
  - Monitor / maintain airway
    - Suction as needed
- Follow Spinal Immobilization Guidelines (245.04) if spinal trauma is suspected
- Stabilize impaled objects in place (e.g. Paper cup and / or gauze to stabilize and shield impaled eye.)
  - Remove object if it compromises the patient’s airway.
- If shock is suspected
  - Elevate patient legs 8-12 inches
    - Use with caution with trauma patient due to potential respiratory compromise
  - Determine underlying causes of shock
  - Maintain body warmth
- Declare Trauma Alert if warranted. (Trauma Transport Guidelines [245.00])

Control bleeding
- Perform focused assessment if the patient is stable or time allows
- Prepare for rapid transport if indicated

Paramedic.
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
  - If fluid challenge is indicated use appropriate large bore route (IV / IO).
  - Do not delay transport of the unstable patient for vascular access
- Follow Pain Management Guidelines (225.00)
Specific Treatment Considerations in Special Trauma Situations

Abdominal trauma.
- Abdominal Evisceration
  - Never replace abdominal viscera
  - Cover with sterile dressing and moisten with NS (may need to periodically remoisten)
  - Secure the wet dressing in place by covering with a large dry dressing to keep the area warm

Arrest (trauma). The goal of patient care in the Trauma Arrest patient is “Load and Go.” Limit scene time to 10 minutes or less. (Call 911 or have dispatch call 911 immediately if extrication is required.)

Emergency Medical Technician.
- Consider Dead on Scene Criteria (210.12)

Paramedic.
- Follow Cardiac Arrest Guidelines (240.16)
- Initiate drug therapy and consider H’s and T’s, time permitting

Chest trauma.
Emergency Medical Technician.
- Flail Chest
  - Stabilization of flailed segment no longer indicated
  - Consider positive pressure ventilation (BVM)
- Sucking Chest Wound
  - Apply Vaseline-type gauze occlusive dressing, plastic or aluminum foil taped in place on three sides
    - If tension pneumothorax develops, release occlusive dressing

Paramedic.
- Caution: Do not over-hydrate
- Consider specific treatment situations
  - Pericardial Tamponade
    - Rapidly infuse NS 500 mL
  - Tension Pneumothorax
    - Follow Needle Thoracentesis Guidelines (215.08)
  - Flail Chest
    - Follow BiPAP Guidelines Special Treatment Situations (215.00)
Specific Treatment Considerations in Special Trauma Situations Continued

Head trauma. Assume cervical spine injury in all patients with significant head trauma. If the head trauma patient is presenting with shock, look elsewhere for the cause.

**Emergency Medical Technician.**
- Control bleeding by direct local pressure. If the underlying skull is unstable, pressure should be applied to the periphery of the laceration over intact bone.
- Bleeding from the nose and/or ears should not be stopped, but a sterile dressing should be placed over the nose and/or ears.

**Paramedic.**
- **If signs or symptoms of increased intracranial pressure are present, ventilate the patient to maintain an average EtCO2 reading of 30 mmHg**
  - Maintain an average EtCO2 of 30 mmHg
    - **Do not allow the EtCO2 readings to remain below 25 mmHg because this will cause additional injury**
- Fluid restriction if systolic BP equal to or greater than 90 mmHg

**Pregnancy in a trauma patient.** Pregnant traumatic patients in their third trimester (sometimes the second) may elicit Supine Hypotensive Syndrome from pressure on the inferior vena cava and may also impair ventilation as the fetus and the uterus press against the diaphragm. Therefore, after immobilization is complete and patient is secure, the LSB should be elevated on its right side approximately 15 degrees (approximately 6 inches), displacing the uterus and fetus to the left side and off of the inferior vena cava.

- If the long spine board (LSB) cannot be elevated, manually displace the uterus to the left as much as possible without causing spinal movement and maintain this displacement throughout the transport.
Treatment
In the event a patient has one or multiple extremity injuries following treatment plan to protect and prevent exacerbation of the injury.

- Apply clean dressing and bandage soft tissue injuries
  - If unable to control bleeding to an extremity with a dressing and pressure bandage, apply a tourniquet
- Splint all areas of tenderness or deformity
- Splint dislocations and joint injuries in the position found
  - Consider ice pack to reduce swelling and pain
- Reduce dislocations or fractures (open or closed) by axial traction for the following reasons:
  - Absence of distal pulses
  - Proper immobilization
- Elevate the extremity when practical
- Monitor distal pulses, sensation and motor function before and after splinting
- Consider specific treatment situations as described on the following pages

Specific Treatment Situations
Acute Compartment Syndrome.
Things to know.
- Rhabdomyolysis is the breakdown of muscle fibers resulting in the release of muscle fiber contents (myoglobin) into the bloodstream.
- Volkmann's contracture is a contraction of the hand and fingers and related tissue degeneration caused by reduced blood flow.

Specific assessment considerations for Acute Compartment Syndrome.
Pathophysiology.
- Acute Compartment Syndrome is a very painful complication of closed and, occasionally, open wounds that results from an increase in pressure within the muscles or “compartments” of the upper or lower extremities
- Thick layers of connective tissue (fascia) separate groups of muscles from each other. The fascia does not stretch or expand, so any swelling in a compartment will lead to increasing pressure to the muscles, blood vessels and nerves of the affected area.
- Acute Compartment Syndrome can occur in both upper and lower extremities; however, the lower extremities, especially the calves, are at greatest risk because of their bulk and fascial anatomy
- Acute Compartment Syndrome is typically a localized injury. Edema of the soft tissue within the compartment compromises venous drainage of the injured area and if further increased, can compromise arterial perfusion, leading to further tissue ischemia.
Extremity Injuries (245.08)
(Page 2 of 5)

Specific signs and symptoms of Acute Compartment Syndrome.
- There are classically 5 “P’s” associated with acute compartment syndrome:
  1. **Pain** - Often reported early and it is the most common and consistent sign. It is described as diffuse, intense and out of proportion to what is normally anticipated; exacerbated with movement, touch, pressure or stretch.
     - Passive Stretching Pain or an increase in pain noted by a patient as a muscle is extended by a healthcare provider
  2. **Paresthesia** - “Pins & needles” in the cutaneous nerves of the affected compartment
     - Paralysis of the limb may occur (late finding)
  3. **Pressure** - Severe tenseness and firmness in the affected compartment with localized swollen and shiny skin
  4. **Palpation** - for diagnosis is not recommended
  5. **Pulselessness** - The least reliable finding and rarely occurs (late finding)

Specific treatment for Acute Compartment Syndrome.
*The first step in pre-hospital management for acute compartment syndrome is Care of the underlying injury.*

Emergency Medical Technician.
- Do NOT elevate or apply cold packs; ice increases vasoconstriction
- Prepare for rapid transport

Paramedic.
- Follow **Pain Management Guidelines (225.00)**
- Consider transport to a facility capable of providing immediate surgical treatment (e.g., fasciotomy)
  - Irreversible tissue death can occur within 4 to 12 hours from the onset of symptoms depending on the type of tissue involved and level of pressure within the compartment
    - Complications can include permanent limb disabilities, rhabdomyolysis, renal failure, Volkmann’s contracture, amputation of the affected limb and death

Amputation.
- Place the amputated part in sterile gauze, moisten with NS, and place in a watertight container. Keep amputated part cool but do not freeze.
- Dress and splint partial amputations in alignment with the extremity, being careful to avoid torsion
- Do not clamp vessels
- Alert hospital for possible reattachment
Crush Syndrome.

*Assessment special considerations for Crush Syndrome.*

*Pathophysiology.*

- The effects of crush syndrome are localized to the affected tissue until the compressive force is released and the tissue is re-perfused by oxygenated blood.
- Patients who are entrapped for days with a severe crush injury appear stable when reached by rescuers.
- Upon release of compression, blood flow is restored to the crushed area and multiple processes begin:
  - Capillary leak leads to hypovolemia, hypotension and possibly hypovolemic shock.
  - Severe metabolic acidosis caused by an increase in the serum potassium concentration decreases the fibrillatory threshold of the heart which makes ventricular fibrillation more likely.
  - The release of myoglobin, uric acid and other toxins into the blood contributes both directly and indirectly to kidney failure (late sign).
  - These toxins and others can cause reperfusion injury in all tissues, especially lung, liver and kidney.
- The patient’s overall health status, total amount of entrapped body surface area, length of the entrapment and weight of the object dictate the extent of the symptoms.

*Morbidity and Mortality.*

- Primary causes of death in crush syndrome include:
  - Hypovolemia
  - Dysrhythmia
  - Renal failure
- Other causes of death include:
  - Adult Respiratory Distress Syndrome (ARDS)
  - Sepsis
  - Electrolyte disturbances
  - Ischemic organ injury (gangrene)

---

*Assessment and treatment special considerations for soft tissue injuries continued on following pages.*
Assessment special considerations for Crush Syndrome continued.

Clinical Manifestations.

- Prior to release from entrapment
  - Generally there is a painless crushed extremity, however the patient may sense an abnormally acute sense of pain, heat, cold or touch (hyperesthesia) or anesthesia
  - In some cases, the degree of pain seems disproportionate for the amount of visible tissue damage
  - Distal pulses may or may not be present; however, they are usually present
- After release from entrapment (without medical intervention)
  - Agitation is common. This may represent toxins affecting the brain as well as alterations in cellular ionic gradients
  - There may be hyperesthesia or anesthesia, but mostly there is severe pain in the crushed extremity
  - Passive movement of the affected limb results in pain
  - Muscle function decreases rapidly and leads to limb paralysis due to direct muscular dysfunction
  - There is progressively marked swelling of the affected area
  - Systemic manifestations of crush syndrome can be seen in seconds to minutes to hours depending on the amount of muscle involved

Diagnosis.

- There needs to be a high index-of-suspicion in order to make this diagnosis
- Identify the potential crush mechanism
- Look for subtle signs and symptoms
- The most consistent clinical finding is loss of two-point discrimination (A person’s ability to differentiate touch stimuli at two nearby points on the body at the same time)
- In a comatose patient, the only clue would be firm swelling of the affected muscle compartments

Specific treatment considerations for crush syndrome are on the following page
Specific treatment considerations for Crush Syndrome.
If the weight of an object has compressed the chest and / or head resulting in apnea or airway compromise, the compressive force must be removed as soon as safely practical.

Emergency Medical Technician.
- If patient is entrapped by collapse debris
  - Closely coordinate the patient’s release from entrapment
  - Re-evaluate frequently while entrapped and immediately upon extrication
  - Anticipate rapid patient deterioration

Paramedic.
- Airway / breathing management
  - Needle decompression for patient with tension pneumothorax (Needle Thoracentesis Guidelines [215.08])
- Infuse NS 1500 mL / hr
  - Ensure fluid replacement is initiated PRIOR to removing the compressive force
- If compression time exceeds 20 minutes, administer Sodium Bicarbonate 1mEq / kg IV / IO just PRIOR to removing the compressive force
  - If the T waves become peaked, the QRS becomes prolonged or hypertension develops, suspect hyperkalemia:
    - Albuterol 2.5 mg via nebulizer
**Soft Tissue Injuries (245.10)**

(Page 1 of 1)

**Treatment**
Treatment requirements will depend upon the mechanism of injury and severity of findings

**Emergency Medical Technician.**
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Immobilize and bandage impaled objects in place
- Return tissue flaps to the original position
- Apply clean dressing and bandage
  - If unable to control bleeding to an extremity with a dressing and bandage, apply a tourniquet
- Treat coexistent injuries or problems (see appropriate treatment protocols)

**Paramedic.**
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
  - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
  - If fluid challenge indicated use appropriate large bore route (IV / IO
Burns are classified according to type (Thermal, Electrical, and Chemical) and thickness. Use the Rule of Nines or the “palm of hand method” (palm of the patient’s hand is 1% of body surface area) to estimate burn area.

**Scene Size Up and History**
- History of incident
  - Duration of exposure
  - Time since exposure
- Description of scene
  - Electrical contact Follow Electrical Injuries Guidelines (245.20)
  - Enclosed space with steam or smoke
  - Type of chemical
    - Follow Specific Hazardous Materials Exposure Guidelines (260.06)
- Medical History
  - Previous injuries
  - Medical illnesses (Especially diabetes, seizures, etc.)
  - Medications
  - Allergies

**Signs and Symptoms**
- Pain
- HEENT
  - Airway inflammation
  - Headache
  - Hoarseness
  - Singed nasal / facial hair
  - Soot in mouth or sputum
- Neurologic
  - Loss of consciousness
  - Seizures
- Respiratory
  - Cough
  - Respiratory distress
  - Stridor
  - Wheezing
- Skin
  - Description of areas involved
  - Thickness of burn
- Vital Signs
  - Vary
- Vomiting
Severity of Burn
Severity of a burn is determined by the following

- Age and health of patient
- Associated injuries
- Body Surface Area (BSA) involved (See Rule of Nines)
- Thickness / depth and location of burn

There are three classifications of burn severity. These are major, moderate, and minor and are determined as follows:

- **Major Burn**
  - All partial or full thickness burns of hands, feet, face, eyes, ears or genitalia
  - Burns complicated by fracture(s) or other major trauma
  - Electrical burns
  - Full thickness greater than 5% BSA
  - High risk patients (e.g., very young, elderly, patients with chronic medical problems)
  - Inhalation injury
  - Partial thickness greater than 25% BSA in adults; greater than 20% BSA in children

- **Moderate Burn**
  - Full thickness 2% to 5% BSA
  - Partial thickness 15% to 25% BSA in adults; 10% to 20% BSA in children

- **Minor Burn**
  - Full thickness less than 2% BSA
  - Partial thickness less than 15% BSA in adults; less than 10% BSA in children

To immediately qualify as a Trauma Alert due to burns the patient must meet the following criteria:

- **Adult**
  - Partial / full thickness (2nd / 3rd degree) burns equal to or greater than 15% of the BSA

- **Pediatric**
  - Partial / full thickness (2nd / 3rd degree) burns equal to or greater than 10% of the BSA
Burns (245.12)
(Page 3 of 4)

Burn Treatment

Emergency Medical Technician.

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
  - Administer 100% O2 for respiratory distress or CO poisoning
- Remove all clothing, jewelry or constricting items from the burned area unless adhered to the patient
- Assess the severity of burn
  - Type, thickness and extent of burn
  - Percentage of body surface area involved using Rule of Nines
  - Issue Trauma Alert if indicated (Trauma Transport Guidelines [245.00])
- If burning agent is chemical, irrigate burned area with copious amounts of NS or sterile water for 20 minutes
- Consider a hyperbaric facility for CO poisoning (Baptist Medical Center or UF Health Gainesville)

EMT treatment precautions.

Consider specific treatment situations:

- Superficial burns
  - Immerse in cool sterile water or apply cool sterile compresses to the burn site
  - Burned hands or feet may be soaked directly in cool sterile water
  - Towels soaked in cool sterile water may be applied to burns of the face or trunk
  - Maintain body warmth; apply a dry sheet or blanket over wet dressings to minimize heat loss

- Partial-thickness burns
  - For minor burns wrap burned areas with sterile cloths or sheets cooled in ambient temperature NS or sterile water or utilize burn gel treatment
  - Cool burn area with NS or sterile water in sufficient quantities to relieve heat penetration in lieu of burn gel treatment
    - Caution: Do not oversaturate
      - For moderate and major burns cover with dry sterile dressing(s)
      - Leave blisters intact
      - Maintain temperature control and body warmth. Do not allow the patient to become hypothermic; shivering further complicates shock.

- Full-thickness burns
  - Wrap burned area in dry sterile dressing, cloths or sheets
  - Remember that partial-thickness burns are normally found within the affected region of the full-thickness burn
  - Maintain temperature control and body warmth. Do not allow the patient to become hypothermic; shivering further complicates shock.
Burns (245.12)
(Page 4 of 4)

EMT treatment precautions continued.

- **Electrical burns**
  - Remove the victim from electrical source if no danger to rescuer
  - Assess and dress entrance and exit wounds
    - Follow Electrical Injuries Guidelines (245.20)
  - Spinal immobilization (245.04) as indicated

- **Chemical burns**
  - Wear appropriate PPE
  - Flush burn areas with NS or sterile water for 20 minutes
    - After flushing cover wound with dry sterile dressing
    - If patient remains symptomatic after initial care, continue irrigation throughout transport
  - For eye exposures:
    - Irrigate eye exposures with lukewarm NS or sterile water as needed or a minimum of 20 minutes
    - After irrigation bandage both eyes with dry sterile dressing

**Paramedic.**

- **Airway / breathing management**
  - Follow Airway Guidelines (215.00)
    - Patients with known inhalation injury or with signs of potential airway burns (e.g., singed nasal hairs, soot in the pharynx, etc.) who are in respiratory distress should be intubated prior to transport with the largest endotracheal tube possible
      - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
      - When any burn patient presents with signs and/or symptoms of respiratory difficulty, O2 saturation and end-tidal CO2 should be assessed as early as possible
  - Follow Carbon Monoxide Guidelines (260.06)
  - Initiate cardiac monitoring; record and evaluate ECG strip
  - Follow Vascular Access Guidelines (220.00)
    - If fluid challenge indicated use appropriate large bore route (IV / IO)
  - Follow Pain Management Guidelines (225.00)
    - Tetracaine 2 drops to each eye before and after irrigation
      - May be repeated every 10 minutes
      - *After the administration of Tetracaine, the patient must be seen by a physician within 24 hours for additional treatment*
Florida experiences more lightning strikes than any other state in the nation, which increases the risk of exposure to electrical injuries. Care should be taken to ensure scene safety in all electrical injury situations prior to approach and/or treatment.

**Scene Size Up and History**
- Description of scene
- Single or multiple victims
- Duration of exposure
- Voltage and current (AC / DC)
- Trauma secondary to fall from high wire or MVC into power line
- Treatment prior to arrival (patient movement, etc.)
- Medical History
  - Previous injuries
  - Medical illnesses (Especially diabetes, seizures, etc.)
  - Medications
  - Allergies

**Signs and Symptoms**
- Skin
  - Burns
  - Pain
  - Entry and exit wounds
- Vital Signs
  - Vary
  - Hypotension and shock
  - Arrest

*Electrical injury treatment procedures on following pages*
**Electrical Injuries (245.20)**

(Page 2 of 2)

**Treatment**

**Emergency Medical Technician.**

- On lightning strike scenes where there are multiple patients, *reverse triage shall be applied and patients in cardiac arrest shall be worked first*
  - Reverse triage is a system of managing a MCI due to a lightning strike in which patients who present initially in cardiac arrest are treated first
- Follow **EMT Assessment and Treatment Guidelines (210.04)**
- Follow **Airway Guidelines (215.00)**
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Treat coexistent injuries or problems (follow appropriate treatment guidelines)
  - Some coexistent injuries are frequently encountered when treating electrical injuries; follow the appropriate guideline:
    - Head Trauma Guidelines (245.06)
    - Extremity Injuries Guidelines (245.08)
    - Soft Tissue Injuries Guidelines (245.10)
    - Burns Guidelines (245.16)

**Paramedic.**

- Airway / breathing management
  - Follow **Airway Guidelines (215.00)**
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
  - Treat dysrhythmias according to the appropriate guidelines
  - Record and evaluate 12 Lead ECG
    - The receiving hospital must receive a hard copy of the 12 Lead ECG with the patient
- Follow **Vascular Access Guidelines (220.00)**
  - If fluid challenge indicated use appropriate large bore route (IV / IO)
- Follow **Pain Management Guidelines (225.00)**
- Be cognizant of internal organ damage and bleeding associated with the path of electricity
Eye Emergencies (245.16)
(Page 1 of 3)

Scene Size Up and History
- Description of scene
- Force involved
- Mechanism of injury (e.g., blunt, penetrating, atraumatic)
- Medical History
  - Previous injuries
  - Medical illnesses (Especially diabetes, seizures, etc.)
  - Medications
  - Allergies
- Treatment prior to arrival

Signs and Symptoms
- Area of pain
- Eyes
  - Lid laceration
  - Blood anterior to pupil (hyphema)
  - Pupil abnormalities
  - Abnormal globe position or softness
- Head
  - Evidence of trauma
- Neurologic
  - Decreased level of consciousness
- Visual problems
- Vital signs
  - Vary
Eye Emergencies (245.16)
(Page 2 of 3)

Treatment

**Emergency Medical Technician.**

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Control hemorrhage
- Assess nature of ophthalmologic emergency
- Direct Trauma
  - Patch both eyes gently without pressure to the globes
    - Stabilize any impaled object and cover affected eye with shield (e.g., paper cup)
  - Maintain patient in supine position to reduce leakage of fluids from the eye
  - If blood is noted in anterior chamber (hyphema), elevate head of the patient’s bed to 40 degrees. If spinal immobilization is indicated, elevate LSB to 40 degrees
  - Dim lights for patient comfort
- Chemical Trauma
  - Irrigate affected eye with lukewarm NS or sterile water for 20 minutes. If patient remains symptomatic after initial irrigation, continue irrigation throughout transport.
  - Apply dry sterile dressings to both eyes
  - Dim lights for patient comfort
- Atraumatic
  - Patch both eyes gently without pressure to the globes
  - Dim lights for patient comfort
  - If patient is being transported for treatment of diagnosed central retinal artery occlusion which is the sudden blurring or loss (partial or total) of vision due to a blockage in the arterial blood supply to the retina
    - Administer 100% O2
    - Place patient in shock position (elevate lower legs 8-12 inches)

*Paramedic and special treatment considerations are detailed on the following page.*
Eye Emergencies (245.16)
(Page 3 of 3)

Treatment Continued

Paramedic.

- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
  - When any burn patient presents with signs and/or symptoms of respiratory difficulty, O2 saturation and end-tidal CO2 should be assessed as early as possible
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
  - If fluid challenge indicated use appropriate large bore route (IV / IO)
- Follow Pain Management Guidelines (225.00)
- If chemical trauma is inflicted by tear gas / pepper spray apply Tetracaine, 2 drops to each eye, before and after irrigation
  - May be repeated every 10 minutes
    - After the administration of Tetracaine, the patient must be seen by a physician within 24 hours for additional treatment

Special considerations.

- Irrigate in a medial to lateral direction to avoid contamination of the unaffected eye
- DO NOT apply pressure to the affected globe
- Remove contact lenses, when applicable
Epistaxis [Nosebleed] (245.18)
(Page 1 of 1)

Epistaxis is a hemorrhage from the nose and in some cases can lead to hemorrhagic shock. Interventions will be determined by the underlying etiology.

Common Causes
- Allergic rhinitis
- Anticoagulant use
- Bleeding disorder
- Hypertension
- Nasal cannula use without humidification
- Prolonged nasal irritation
- Sinusitis
- Trauma

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
  - Do not use nasal cannula
  - If other injuries do not exist, prevent aspiration of blood by placing the patient in a sitting position with their head leaning forward
  - Suction the airway as required if unable to position the patient
- Control hemorrhage by pinching the nostrils and packing gauze between the upper lip and gum to provide pressure
  - To facilitate clotting instruct the patient not to sniff, blow or manipulate the nasal passages in any way
- If associated with a head injury and CSF drainage, assume a spinal injury; immobilize the spine and DO NOT attempt to control the bleeding

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- If associated with a head injury and CSF drainage, follow Trauma Treatments and Specific Considerations Guidelines (245.06)
- If associated with hypertension, follow Hypertensive Urgency (240.08)
- If control of hemorrhage cannot be accomplished
  - In order to tamponade the bleeding, insert a nasopharyngeal airway lubricated with Lidocaine Jelly. If the patient gags, pull back slightly. Tape in place.
  - Follow Hypotension / Shock Medical Guidelines (230.12) if appropriate
**Decompression Sickness / Dysbarism (245.20)**

(Page 1 of 2)

**Things to Know**

**Decompression Sickness** is a multi-system disorder resulting from the liberation of gas bubbles from solution when ambient pressure decreases (e.g., Type I skin and / or musculoskeletal “bends" or Type II - neurological, serious symptoms)

**Dysbarism** is a syndrome of illness / injury resulting from differences in pressure between the environment and tissues / organs either directly (barotrauma) or indirectly (decompression sickness)

**Assessment**

**Etiology.**
- Dysbarism
- Barotrauma
- Decompression sickness

**History.**
- Altitude
  - Depressurization or inadequate pressurization while flying at high altitude
  - High altitude exposure after scuba diving
- Scuba Diving
  - Air tank failure
  - Rapid ascent
  - Prolonged / repetitive dive profile

**Signs and Symptoms.**
- Chest pain
- Cramps
- Dizziness
- Fatigue
- Headache
- Joint pain
- Nausea / vomiting
- Neurologic
  - AMS / coma
  - Seizures
  - Spinal deficits / paralysis (hemi / para / multi-plegias)
- Skin
  - Tenderness
  - Mottling
  - Rash from bubble emboli
  - Subcutaneous emphysema
Decompression Sickness / Dysbarism (245.20)
(Page 1 of 2)

Assessment Continued

Signs and symptoms continued.

- Respiratory
  - Cough
  - Respiratory distress / dyspnea without pneumothorax (decompression illness)
  - Pneumothorax
- Vital signs
  - Hypotension (in severe cases)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- If trauma suspected, follow Spinal Immobilization Guidelines (245.04)
- Retrieve dive computer (if appropriate) and ensure transport with patient and / or determine depth and length of the dive

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
  - Observe for signs of tension pneumothorax
    - Perform needle decompression on the involved side
- Consider transport to a hyperbaric treatment facility
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
**Vaginal Bleeding (250.00)**

(Page 1 of 2)

**Assessment**
- Onset
- Duration
- Amount (number of pads or tampons, clots and tissue fragments)
- Medical History
  - Medical illnesses (bleeding disorders, etc.)
  - Medications
  - Allergies
- Menstrual history (LMP)
- Contraception usage and method (pill, IUD, etc.)
- Pregnancy
  - Currently?
    - Estimated due date?
  - Number of abortions therapeutic or spontaneous (Aborta)
  - Para / Gravida (births / pregnancies)
  - Postpartum?
    - Time and place of delivery
- Trauma

**Signs and Symptoms**
- Abdominal
  - Pain / cramps
  - Tenderness
    - Rebound?
  - Distension
  - Guarding
- Altered level of consciousness (ALOC)
- Dizziness
- Nausea / vomiting
- Passage of clots, tissue fragments (bring to ED)
- Skin
  - Cool
  - Clammy
  - Diaphoresis
  - Pallor
- Thirst
- Vital Signs
  - Hypotension
    - Postural hypotension
    - Tachycardia
- Weakness
Vaginal Bleeding (250.00)
(Page 2 of 2)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Apply pads to vaginal area
- Consider specific treatment situations shown below

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Follow Vascular Access Guidelines (220.00)

Specific treatment situations.
- 1st or 2nd Trimester or unknown pregnancy status
  - Allow the patient to assume a position of comfort
- 3rd Trimester Bleeding
  - Place patient in recovery position (left side)
Hypertensive State of Pregnancy (250.02)
(Page 1 of 2)

Assessment

Pre-Eclampsia.
- Hypertension, edema and proteinuria developing during pregnancy
- Occurs in about 5% of the pregnant population
- Usually develops after 20th week of pregnancy

**Mild Pre-Eclampsia**
- Systolic BP greater than 140
- Diastolic BP greater than 90
- Greater than 30 mmHg increase in systolic BP above baseline, if known
- Greater than 15 mmHg increase in diastolic BP above baseline, if known
- Non-dependent edema (facial or hand edema)
  - Edema is not a reliable sign as it is often not present in pre-eclampsia / eclampsia
- Persistent or recurring headache
- Vision changes (e.g., flashing lights, dots before eyes, dimming or blurred vision)
- Abdominal pain
- Diminished or infrequent urination (oliguria)
- Weight gain greater than 2 lb per week

**Severe Pre-Eclampsia**
- Abdominal pain
- Hypertension
  - Systolic BP greater than 160
  - Diastolic BP greater than 110
- Diminished or infrequent urination (oliguria)
- Dyspnea
- Generalized edema
- Persistent or recurring headache
- Vision changes (e.g., flashing lights, dots before eyes, dimming or blurred vision)
- Weight gain greater than 6 lb per week

**Complications**
- Fetal complications due to prematurity (e.g., low birth weight and respiratory compromise)
- Maternal complications include early delivery and progression to eclampsia
  - *Treatment of mild pre-eclampsia is bed rest and delivery*

**Eclampsia.**
- Poor maternal prognosis
- Seizures
  - Onset of seizure activity in the pre-eclampsia patient indicates eclampsia
    - Can occur postpartum (up to six weeks)
    - Pt hyperventilates after the tonic-clonic seizure to compensate for acidosis
- Usually no aura precedes seizure(s) and the patient may experience multiple episodes
Hypertensive State of Pregnancy (250.02)
(Page 2 of 2)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Consider specific treatment situations listed below

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Determine BGL by finger stick, if not previously obtained
- Follow Vascular Access Guidelines (220.00)
- Consider specific treatment situations listed below

Specific treatment situations.
- Active seizures
  - Magnesium Sulfate 4 grams IV / IO
  - Valium 2 to 10 mg IV / IO / PR titrated to control seizures that are unresolved by Magnesium Sulfate
- BGL less than 70 mg / dl
  - Follow Diabetic Emergencies Protocol (230.04)
- Severe Pre-Eclampsia (systolic BP greater than 160 mmHg on two readings)
  - Magnesium Sulfate 4 grams IV / IO infusion in 100 mL NS over several minutes
- Severe Pre-Eclampsia (systolic BP greater than 220 mmHg and diastolic BP greater than 120 mmHg) AND after Magnesium Sulfate administration
  - Labetalol 10 mg IV / IO
    - Labetalol is not carried on Century units, but may be obtained from sending facility if available
      - If not at a facility then rapid transport is the best treatment
Assessment

- Estimated due date and number of fetuses (if known)
- Last menstrual period (LMP)
- Maternal age
- Number of abortions therapeutic or spontaneous (Aborta)
- Para / Gravida (births / pregnancies)
- Prenatal care
- Problems with current or previous pregnancies
- Ruptured membranes
- Vaginal fluid drainage, bleeding

Signs and Symptoms

- Bleeding
- Location of pain
- Regularity and timing of contractions
- Urge to push
- Vital Signs
  - Hypertension (pre-eclampsia)
  - Routine
- Skin
  - Facial or extremity edema
- Genitor-Urinary
  - Contraction and relaxation of uterus
  - Vaginal bleeding or fluid (color, odor)
  - Crowning
  - Abnormal presentation (foot, arm, cord)

Specific signs and symptoms at specific stages of labor.

- **First Stage** (onset of contractions and dilation of the cervix)
  - Frequency and duration of uterine contractions
  - Hemorrhage estimated blood loss
- **Second Stage** (fetal head entering the vaginal canal to expulsion of the fetus)
  - Urge to push
  - Presentation of fetal parts (e.g., cephalic, breech, limb, etc.)
  - Hemorrhage estimated blood loss
  - Nuchal cord wrapped around infant's neck
  - Injuries (tears) to external genitalia or vagina
  - Evaluate infant on delivery APGAR score
- **Third Stage** (expulsion of the placenta)
  - Evaluate and manage infant
  - Hemorrhage? Estimated blood loss?
  - Placenta must be brought to the hospital for evaluation
Imminent Delivery (250.04)
(Page 2 of 2)

Treatment

Emergency Medical Technician.

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Consider specific treatment situations shown below for delivery and postpartum care

Paramedic.

- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Follow Transport and Destination Determination Guidelines (204.00)
- Follow Newborn Stabilization / Resuscitation Guidelines (250.08)

For imminent birth or complication, transport to nearest facility with consideration given to the ability of the facility to provide specialized care for the mother and neonate

Specific treatment situations.

Delivery

- Apply gentle perineal pressure to allow a slow, controlled delivery of the head
- Observe for meconium staining
- If the amniotic fluid is meconium stained thoroughly suction the newborn’s hypopharynx (Inferior portion of the pharynx, between the epiglottis and the larynx) and then the nostrils, after delivery of the head but before delivery of the rest of the body, if possible and before stimulating the baby to breathe
- As soon as the head is delivered suction the oropharynx first before the nostrils
- Follow Newborn Stabilization / Resuscitation Guidelines (250.08)
- Apply 2 clamps (2 to 3 inches apart), 7 to 10 inches from abdomen of the neonate
- Cut cord between clamps
- Maintain body temperature of neonate post delivery

Postpartum

- Assess for postpartum hemorrhage
- Gently massage uterus until firm
- Allow mother to breastfeed if umbilical cord has been cut and neonate is stable

Delivery complications addressed in procedures on following pages.
Complications of Delivery (250.06)

(Page 1 of 2)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Anticipate rapid transport
- Consider specific treatment situations listed below

Paramedic
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Follow Transport and Destination Determination Guidelines (204.00)
- Follow Vascular Access Guidelines (220.00)
- For imminent birth or complication, transport to nearest facility with consideration given to the ability of the facility to provide specialized care for the mother and neonate
  - Follow Newborn Stabilization / Resuscitation Guidelines (250.08)

Specific treatment situations.
- Abruptio Placenta or Placenta Previa
  - Follow Hypotension / Shock Medical Guidelines (230.12)
- Breech Delivery (The presentation of the baby’s buttocks or legs first.)
  - If delivery is not immediate:
    - Place the mother in the knee-chest position
  - If delivery is immediate:
    - Allow the buttocks or feet to deliver on their own and support the trunk
    - Check for the umbilical cord around the neonate’s neck and allow the head to deliver
    - If the head does not deliver within 3 minutes, use a gloved hand to make an airway for the neonate, using the fingers to make airspace
  - Limb or Brow Presentation
    - Place the mother in the knee-chest position

Specific treatment situations continued on next page.
Specific treatment situations continued.

- **Multiple Births or Premature Birth**
  - Change gloves prior to the next delivery
  - See *Newborn Stabilization / Resuscitation Guidelines (250.08)* on following page

- **Nuchal Cord** (The umbilical cord is wrapped around the baby’s neck.)
  - Feel for the cord around the neck as soon as the head is delivered
  - Gently remove the cord from around the neck
    - If unable to remove, clamp and cut the cord
    - Use extreme caution to avoid cutting the patient or yourself

- **Prolapsed Cord** (The vaginal presentation of the umbilical cord prior to the delivery of the neonates head)
  - Assessment should focus on the presence of pulses in the umbilical cord and relief of the pressure obstructing the blood flow within the cord
  - Place the mother in the knee-chest position or supine with hips elevated
  - Relieve pressure from the prolapsed cord if no pulses are detected in the cord
    - Use gloved hand to gently but firmly push the neonate’s head back into the vagina; avoid pushing on the fontanels
    - Cease pushing and hold position upon return of pulses in the cord
    - Do not push the cord back into the vagina, but keep moist with NS soaked towels
**Newborn Stabilization / Resuscitation (250.08)**

(Page 1 of 4)

**Things To Know**
The majority of newborns require no stabilization beyond drying, warming, positioning, suctioning and tactile stimulation. If there are multiple births, the newborn is premature, there is meconium staining or the mother experiences heavy vaginal bleeding then invasive procedures may be required. *Note: The Average Term Infant Weighs Approximately 3 Kg.*

<table>
<thead>
<tr>
<th>APGAR Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Blue all over</td>
<td>Acrocyanosis (pink trunk; blue extremities)</td>
<td>Pink all over</td>
</tr>
<tr>
<td>Pulse</td>
<td>Absent</td>
<td>&lt; 100</td>
<td>≥ 100</td>
</tr>
<tr>
<td>Grimace / Irritability</td>
<td>No response / none</td>
<td>Grimace / Weak cry</td>
<td>Sneeze, Cough OR Vigorous cry</td>
</tr>
<tr>
<td>Activity / Muscle Tone</td>
<td>Limp / flaccid</td>
<td>Some motion / flexion of extremities</td>
<td>Active motion</td>
</tr>
<tr>
<td>Respirations</td>
<td>Absent</td>
<td>Slow / irregular</td>
<td>Vigorous cry OR Normal respirations</td>
</tr>
</tbody>
</table>

**Assessment and Treatment**

*Emergency Medical Technician (EMT).*
- Follow [EMT Assessment and Treatment Guidelines (210.04)]
- Follow [Airway Guidelines (215.00)]
  - Suction oral cavity first, then the nostrils if needed, with a bulb syringe or mechanical suction with a negative pressure less than 100 cmH2O
  - Note: If the amniotic fluid is meconium stained thoroughly suction the newborn’s hypopharynx (Inferior portion of the pharynx, between the epiglottis and the larynx) and then the nostrils before stimulating the baby to breathe
    - Administer supplemental O2 as needed to maintain saturation 95 - 100%
- Follow [AHA’s Newborn Resuscitation Algorithm]
- Assess newborn’s APGAR score at one minute and five minutes post-delivery
- Position the infant in the supine position with the neck in a neutral position. A 1” blanket roll under the shoulders can help maintain head position
- Thoroughly dry the newborn with warm towels / blankets. Replace wet towels / blankets.
- Maintain the neonate’s warmth
- Tactile stimulation if indicated (gently tap soles of feet or rub back)
- Closely monitor the cut umbilical cord for bleeding Re-assess every 30 seconds
- Determine BGL by heel stick
- Consider specific treatment situations on page two (2) of these protocols.
Assessment and Treatment Continued
Paramedic (PMD).
- The standard newborn delivery should not require any advanced level interventions. If any of the following specific treatment situations apply then
  - Notify the closest appropriate NICU receiving facility as early as possible so they can assemble their resuscitation team
  - *Initiate rapid transportation*
- Airway / breathing management:
  - Follow [Airway Guidelines (215.00)](#)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and monitor ECG strip
- Determine BGL by heel stick, if not previously obtained
- *Consider specific treatment situations shown below*

Specific treatment situations.
- **Absent or depressed respirations and / or decreased muscle tone and thick meconium is present**
  - PMD
    - Perform direct laryngoscopy immediately after birth for suctioning of residual meconium from the hypopharynx (under direct visualization) and intubation / suction of the trachea
      - Perform endotracheal intubation
      - Apply suction directly to the endotracheal tube as it is withdrawn from the airway
      - Repeat intubation with a new ETT, suction and withdraw
      - Repeat intubation with new ETT, confirm placement, secure the ETT and apply positive pressure ventilation
    - *If initial intubation is difficult, DO NOT apply suction;* confirm placement, secure the ETT and apply positive pressure ventilation
- **Acrocyanosis (pink trunk; blue extremities)**
  - EMT
    - Administer blow-by O2; maintain saturation between 95 to 100%
- **HR less than 100, meconium present, depressed respirations and decreased muscle tone**
  - EMT
    - Ventilate with BVM
    - Warm, dry and stimulate

*Specific treatment situations continued on next page.*
Newborn Stabilization / Resuscitation (250.08)
(Page 3 of 4)

Assessment and Treatment Continued

Specific treatment situations continued.

- **HR less than 60 after chest compressions and ventilation**
- Follow Vascular Access Guidelines (220.00)
  - Fluid challenge if indicated
    - Administer the following medications via peripheral IV / IO:
      - *Epinephrine 1:10,000 0.01 mg / kg* every 3 to 5 min IV / IO
      - Narcan 0.1 mg / kg IV / IO
      - **Administer every 3 min as needed** to stimulate spontaneous respiratory effort if respiratory depression in a newborn of a mother who received narcotics within 4 hours of delivery
    - **D10W 5 mL / kg IV / IO**
      - **May repeat dose once**
      - Determine BGL by heel stick, if not previously obtained
      - Refer to Pharmaceutical Reference for mixing guidelines
- Insert nasogastric or orogastric tube if BVM respirations were required for greater than 2 minutes
- **Patient presents with persistent central cyanosis, apnea, no vigorous cry, no muscle tone and heart rate less than 100**
  - **EMT**
    - Ventilate with 100% O2 at 40 to 60 breaths / minute (Initial ventilation pressures may exceed 30 to 40 cmH2O, therefore occlude the pop-off valve)
    - HR less than 60
      - Administer chest compressions at a rate of 120 per minute
      - Re-assess every 30 seconds
  - **PMD**
    - Intubate
    - Continue ventilation and O2 administration as noted above
    - Insert nasogastric or orogastric tube if BVM respirations were required for greater than 2 minutes
- **Vigorous newborn with meconium-stained fluid develops apnea or respiratory distress**
  - Perform tracheal suctioning before positive-pressure ventilation
  - Insert nasogastric or orogastric tube if BVM respirations were required for greater than 2 minutes
AHA’s Newborn Resuscitation Algorithm
Source: American Heart Association, Inc.
Newborn Resuscitation

Term gestation? Breathing or crying? Good tone?

Yes, stay with mother

No

Warm, clear airway if necessary, dry, stimulate

No

HR below 100, gasping, or apnea?

Yes

Laborated breathing or persistent cyanosis?

Yes

Clear airway
SPO2 monitoring
Consider CPAP

No

PPV, SPO2 monitoring

No

HR below 100?

Yes

Take ventilation corrective steps

No

HR below 60?

Yes

Consider intubation
Chest compressions
Coordinate with PPV

No

Take ventilation corrective steps
Intubate if no chest rise!

Consider:
• Hypovolemia
• Pneumothorax

Yes

HR below 60?

Postresuscitation care

Targeted Precordial SPO2
After Birth
1 min 60%-65%
2 min 65%-70%
3 min 70%-75%
4 min 75%-80%
5 min 80%-85%
10 min 85%-95%

*Epinephrine dose is 0.01mg / kg (1:10,000 @ 0.01mL / kg) IV / IO
Abandoned Newborns (250.10)
(Page 1 of 1)

Legal Authority
Florida statute 383.50 as shown below allows for new parents to anonymously leave a newborn (7 days old or younger) at an emergency medical services station without repercussion. Although operating under the sector of a private practice, Century is an emergency medical services station and therefore must honor and abide by the following procedures for the handling of the situation, should it arise.

F.S. 383.50 (5) “Except when there is actual or suspected child abuse or neglect, any parent who leaves a newborn infant with a firefighter, emergency medical technician, or paramedic at a fire station or emergency medical services station, or brings a newborn infant to an emergency room of a hospital and expresses an intent to leave the newborn infant and not return, has the absolute right to remain anonymous and to leave at any time and may not be pursued or followed unless the parent seeks to reclaim the newborn infant.”

Procedures for Handling an Abandoned Newborn
Any employee discovering an abandoned neonate, or being given a qualifying neonate, shall
1. attempt to gain any medical history, relating to the child, if the parent is present;
2. assess newborn per neonatal / pediatric resuscitation guidelines;
3. notify law enforcement agency;
4. and transport neonate to nearest appropriate receiving facility.

Except when there is actual or suspected child abuse or neglect, any parent who leaves a newborn infant with Century employee, emergency medical technician, or paramedic or at one of Century’s locations and expresses an intent to leave the newborn infant and not return, has the absolute right to remain anonymous and to leave at any time and may not be pursued or followed.

Parents may leave behind information regarding medical and social history regarding the newborn. In the event this information is not volunteered attempt to obtain and record that history.
- Reassure the parent that only pertinent medical history is requested and that no identifying information will be documented. (Let them write it down if it makes them more amenable to providing the information)
- If any written information is available, bring it with the patient to nearest appropriate receiving facility
## General Definitions for Pediatrics

- Neonate: Birth to 1 month
- Infant: Greater than 1 month to 1 year of age
- Child: Greater than 1 year to 12 years of age
- Adolescent: Greater than 12 years to 15 years of age
- Adult: Greater than 15 years of age

## General Assessment for Pediatrics

### Pediatric Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Response</th>
<th>Adolescent</th>
<th>Child</th>
<th>Infant / Neonate</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Opening</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Opening</td>
<td>Spontaneous</td>
<td>Spontaneous</td>
<td>Spontaneous</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>To Speech</td>
<td>To speech</td>
<td>To speech</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>To Pain</td>
<td>To pain</td>
<td>To pain</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td><strong>Best Verbal Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Opening</td>
<td>Oriented</td>
<td>Oriented, appropriate</td>
<td>Coos and babbles</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Confused</td>
<td>Confused</td>
<td>Irritable, cries</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Inappropriate words</td>
<td>Inappropriate words</td>
<td>Cries in response to pain</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Incomprehensible sounds</td>
<td>Incomprehensible words or nonspecific sounds</td>
<td>Moans in response to pain</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td><strong>Best Motor Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Opening</td>
<td>Obey</td>
<td>Obey commands</td>
<td>Moves spontaneously and purposely</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Localizes</td>
<td>Localizes painful stimulus</td>
<td>Withdraws in response to touch</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Withdraws</td>
<td>Withdraws in response to pain</td>
<td>Withdraws in response to pain</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Abnormal flexion</td>
<td>Flexion in response to pain</td>
<td>Decorticate posturing (abnormal flexion) in response to pain</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Extensor response</td>
<td>Extension in response to pain</td>
<td>Decerebrate posturing (abnormal extension) in response to pain</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Score</strong></td>
<td></td>
<td></td>
<td></td>
<td>3-15</td>
</tr>
</tbody>
</table>
Pediatric Guidelines (255.00)
(page 2 of 2)

General Treatment for Pediatrics

More specific guidelines are available for the following linked complaints:

- Fever
- Seizures
- Coma / Altered Mental Status
- Allergic Reactions / Anaphylaxis
- Respiratory Distress
- Cardiac Arrest
- Bradycardia
- Tachycardia
- Shock
- Drowning / Near-Drowning
- Overdose, Poisoning, or Ingestion
- Occult Conditions

Emergency Medical Technician.

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Accurate respiratory assessment is essential in the pediatric patient
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Assess circulation and perfusion by measuring heart rate and observing skin color, temperature, capillary refill and the quality of central / peripheral pulses
  - Routinely assess BP’s in children older than 3 years
- Remove clothing as necessary to perform detailed physical exams (consider toe-to-head assessment for the conscious patient).
  - Consider child’s modesty
  - Maintain the child’s body temperature throughout the examination.
- Reassess the patient frequently

Paramedic.

- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Follow Pediatric Shock Guidelines (255.12) if indicated
- If the patient’s condition is critical or unstable, initiate transport and perform focused history and detailed physical examination en route if patient status and resources permit.
  - If the patient’s condition is stable, perform focused history and detailed physical examination on the scene; then initiate transport
- Reassess the patient frequently
Fever is a very common presenting sign of illness in children but there exists a large scope and severity of etiologies.

**Treatment**

- **Emergency Medical Technician.**
  - Follow [EMT Assessment and Treatment Guidelines](210.04)
  - Follow [Pediatric Guidelines](255.00)
  - Follow [Airway Guidelines](215.00)
    - Administer supplemental O2, maintain saturation between 95 and 100%
  - Apply cooling measures (do not use ice or cold water) if oral or rectal temperature is greater than 105°F (tympanic greater than 104°F)
  - Prepare for febrile seizures

- **Paramedic.**
  - Airway / breathing management:
    - Follow [Airway Guidelines](215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
  - Determine BGL by finger stick, if not previously obtained
  - Initiate cardiac monitoring; record and evaluate ECG strip
  - Follow [Vascular Access Guidelines](220.00)
  - If the patient experiences seizures, follow the [Pediatric Seizures Guidelines](255.04)
  - If the patient is experiencing shock or hypotension, follow [Pediatric Shock Guidelines](255.12)
**Pediatric Seizures (255.04)**

(Page 1 of 2)

**Things to Know**
- **Status epilepticus** is a single seizure lasting longer than 10 minutes or repeated seizures without full recovery of responsiveness between each seizure.

**Treatment**

**Emergency Medical Technician.**
- Follow [EMT Assessment and Treatment Guidelines (210.04)]
- Follow [Pediatric Guidelines (255.00)]
- Follow [Airway Guidelines (215.00)]
  - Administer 100% O2 or blow-by as tolerated
- If breathing adequate and no trauma, place child in the recovery position
- Evaluate and record temperature
  - If applicable, follow Pediatric Fever Guidelines for cooling measures

**Paramedic.**
- Airway / breathing management
  - Follow [Airway Guidelines (215.00)]
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow [Vascular Access Guidelines (220.00)]
- Determine BGL by finger stick, if not previously obtained
- Perform focused history and detailed physical examination en route to the hospital
- Determine if previous dose(s) of benzodiazepines were administered prior to crew arrival
- Reassess the patient frequently
- **Consider specific treatment situations listed below**

**Specific treatment situations.**
- **Hypoglycemia**
  - Administer Dextrose
    - Neonate D10W 5 mL / kg IV / IO for BGL less than 45 mg / dl
    - Refer to Pharmaceutical Reference for mixing guidelines
    - To convert D50 into D10, dilute 10mL of D50 (5g) into 40mL NS.
    - Infant / Child D25W 2 mL / kg IV / IO for BGL less than 60 mg / dl
    - Refer to Pharmaceutical Reference for mixing guidelines
    - To convert D50 into D25, dilute 25mL of D50 into 25mL NS.
    - Adolescent D50W 1 mL / kg IV / IO for BGL less than 60 mg / dl
    - Maximum single dose is 12.5 grams
  - Repeat BGL by finger stick in 5 minutes
    - If BGL remains less than 60 mg / dl (for the neonate less than 45 mg / dl) after treatment and there is no change in mental status repeat appropriate dextrose dose one time
Treatment Continued
Specific treatment situations continued.

- **Status Epilepticus / active seizures**
  - Valium 0.25 mg / kg IV / IO (maximum single dose 5 mg)
  - If vascular access cannot be obtained administer anticonvulsants per rectum (PR)
    - **Valium 0.5 mg / kg** per rectum (PR) (maximum single dose 10 mg)
  - Anticipate respiratory depression and be prepared for intubation
  - If seizures persist, after 10 minutes, repeat dose
Pediatric Coma / Altered Mental Status (AMS) Diabetic Emergencies (255.06)

(Page 1 of 3)

History

- Duration
- Description of scene (e.g., pills found, notes, syringes, etc.)
- Drug or alcohol ingestion
- Exertion or heat exposure
- Medical History
  - Medical illnesses (e.g. Psychiatric disorders, diabetes, seizures, etc.)
    - History of trauma
  - Medications
  - Allergies (Prior reaction history)
- Onset (acute vs. gradual)
- Recent emotional trauma or crisis (including suicidal or homicidal ideation)
- Toxic exposure
- Unusual odor in residence or at scene

Common Causes

- Diabetes
- Drug overdose
- Head trauma
- Psychiatric illness
- Other metabolic disorders, such as kidney or liver failure
- Seizures
- Sepsis
- Stroke

Signs and Symptoms

- Abrupt or bizarre behavior changes
- HEENT
  - Breath odor (alcohol, ketones)
  - Pupil size, symmetry, and reactivity
- Neck
  - Nuchal rigidity (stiff neck)
  - Suspect c-spine injury in the presence of head trauma
- Respiratory
  - Abnormal breathing patterns
- Skin
  - Cyanosis
  - Diaphoresis
  - Needle tracks
- Vital Signs
  - Vary
Signs and Symptoms Continued

- Neurologic
  - Decreased level of consciousness
  - Focal deficits
  - Hallucinations
  - Seizures
- Other
  - Evidence of trauma
  - Medical alert tags

Treatment

**Emergency Medical Technician.**
- Follow [EMT Assessment and Treatment Guidelines (210.04)]
- Follow [Pediatric Guidelines (255.00)]
- Follow [Airway Guidelines (215.00)]
  - Administer 100% O2 or blow-by as tolerated

**Paramedic.**
- Airway / breathing management:
  - Follow [Airway Guidelines (215.00)]
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Determine BGL by finger stick, if not previously obtained
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow [Vascular Access Guidelines (220.00)]
- Reassess the patient frequently
- Consider specific treatment situations

Specific treatment situations.
- **Consider causes of altered mental status such as chemical or drug intoxication, toxic exposure, head trauma or seizure**
- **Consider other treatable neurological or metabolic disorders and if identified follow the appropriate guideline**
  - Assess temperature, 12 Lead ECG, etc.
- **Hyperglycemia**
  - If BGL is greater than 400 mg / dl and there is no indication of pulmonary edema, administer NS 10 mL / kg over one hour
    - Caution: Do not over-hydrate
Treatment Continued
Specific treatment situations continued.

- **Hypoglycemia (Symptomatic)**
  - Administer Dextrose
    - Neonate D10W 5 mL / kg IV / IO for BGL less than 45 mg / dl
      - Refer to Pharmaceutical Reference for mixing guidelines
      - *To convert D50 into D10, dilute 10mL of D50 (5g) into 40mL of Normal Saline.*
    - Infant / Child D25W 2 mL / kg IV / IO for BGL less than 60 mg / dl
      - Refer to Pharmaceutical Reference for mixing guidelines
      - *To convert D50 into D25, dilute 25mL of D50 into 25mL of Normal Saline.*
    - Adolescent D50W 1 mL / kg IV / IO for BGL less than 60 mg / dl
      - Maximum single dose is 12.5 grams
      - Repeat BGL by finger stick in 5 minutes
        - If BGL remains less than 60 mg / dl (for the neonate less than 45 mg / dl) after treatment and there is no change in mental status repeat appropriate dextrose dose one time

- **Normal BGL and continued altered mental status**
  - Narcan 0.1 mg / kg (maximum single dose 0.5 mg) IV / IO
    - If vascular access unavailable, administer same dose IM / SQ

- **Signs and Symptoms of Shock**
  - Administer fluid challenge of NS 20 mL / kg (10 mL / kg for Neonate) IV / IO
    - If the patient responds appropriately, repeat infusion to a maximum total dose of 60 mL / kg (30 mL / kg for Neonate)
Pediatric Allergic Reactions / Anaphylaxis (255.08)

Treatment will be guided by the degree of distress. Ordinary allergic reactions require minimal intervention but must be monitored for symptom progression. The patient who presents with respiratory compromise and shock should be treated for anaphylactic shock.

History
- Exposure, ingestion or contact (e.g., stings, drugs, foods, etc.)
- Medical History
  - Medical illnesses
  - Medications
  - Allergies (Prior reaction history)

Signs and Symptoms by Degree of Reaction

Mild.
- Anxiety
- Itching
- Localized Swelling
- Rash
- Redness
- Urticaria (hives)

Moderate.
- All of the above
- Abdominal pain
- Combativeness
- Cough
- Lethargy
- Nausea / vomiting
- Tachycardia
- Weakness
- Wheezing

Severe.
- All of the above
- Hoarseness
- Hypoperfusion (caused by vasodilation)
- Inadequate respirations (tidal volume and / or rate)
- Pale and cool skin
- Stridor
- Tongue and / or upper airway (uvula) edema
- Upper airway noise
- Unresponsive
Pediatric Allergic Reactions / Anaphylaxis (255.08)
(Page 2 of 2)

Treatment

Emergency Medical Technician.

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Pediatric Guidelines (255.00)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2 or blow-by as tolerated
- If evidence of anaphylaxis present, administer or assist patient with auto-injector
- If breathing adequate, place child in a position of comfort

Paramedic.

- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- *Consider specific treatment situations as listed below by degree of reaction*

Specific Treatment Situations.

- **Mild Reaction.**
  - Benadryl 1mg / kg IV / IO / IM (maximum single dose 25 mg)
  - May repeat once in 15 minutes (maximum total dose 50 mg)

- **Moderate Reaction**
  - Complete the mild reaction treatments (concurrently if possible)
  - Albuterol 2.5 mg and Atrovent 0.5 mg
    - Repeat dose will contain only Albuterol 2.5 to 5 mg

- **Severe reaction**
  - Complete the mild and moderate reaction treatments (concurrently if possible)
  - Epinephrine 1:1,000 0.01 mg / kg (maximum single dose 0.5 mg) via SQ / IM injection

- **Anaphylactic Shock**
  - Complete the mild, moderate and severe reaction treatments (concurrently if possible)
  - Epinephrine 0.1 mL / kg (0.01 mg / kg) of 1:10,000 IV / IO every 3 to 5 minutes until response noted (maximum single dose is 1.0 mg)
  - Follow Pediatric Shock Guidelines (255.12)
  - Reassess patient frequently
  - Be prepared to intubate
  - Initiate transport.
  - Perform focused history and detailed physical examination en route to the hospital, if patient status and management of resources permit.
Pediatric Respiratory Distress (255.10)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Pediatric Guidelines (255.00)
- Follow Airway Guidelines (215.00)
  - Consider specific treatment situations Foreign Body Airway Obstruction (FBAO) listed on the following page

Paramedic.
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patient
  - Visualize and remove foreign body using direct laryngoscopy. If foreign body cannot be removed or dislodged, attempt to bypass or push the obstruction to one bronchus below the carina.
  - Intubate pediatric patients experiencing cardiac arrest, respiratory failure, inadequate BVM ventilation or when prolonged ventilation will be required (avoid blind nasotracheal intubation)
  - If positive pressure ventilation is performed for a time period greater than 5 minutes (greater than 2 minutes in the neonate) before intubation or if the patient’s abdomen becomes distended, insert a nasogastric tube (determine size by Broselow® Tape)
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Consider specific treatment situations

Specific treatment situations are detailed on the following pages.
Pediatric Respiratory Distress (255.10)
(Page 2 of 3)

Specific treatment situations.

Foreign Body Airway Obstruction (FBAO).
- Child Conscious
  - Mild Obstruction with Good Air Exchange
    - Encourage spontaneous coughing and breathing efforts
  - Severe Obstruction
    - Abdominal thrusts (Heimlich maneuver)
- Child Unconscious
  - Reposition airway and remove object if seen safe to remove.
  - Begin CPR
  - Suction as indicated
  - If choking relieved, then follow AHA’s BLS Pediatric Healthcare Provider Algorithm
- Infant Conscious
  - Mild Obstruction with good air exchange
    - Do not interfere with patient’s own attempts to expel the obstruction
    - Monitor closely for signs of worsening
  - Severe Obstruction
    - If possible, bare the infant’s chest
    - With infant in prone position (supported in rescuer’s arms), deliver up to 5 back blows (slaps) forcefully in the middle of the back between the infant’s shoulder blades, using the heel of your hand
    - Continue supporting the infant, rotate to a supine position with head lower than the trunk and check airway to see if object was expelled.
    - Deliver up to 5 quick downward chest thrusts in the same location as chest compressions
    - Repeat sequence until obstruction is cleared or the infant becomes unresponsive
- Infant Unconscious
  - Reposition airway and remove object if seen
  - Begin CPR
    - Assist ventilation with appropriate BVM as indicated (initial ventilation pressures may exceed 30 to 40 cm / H2O so occlude the pop-off valve)
      - Premature Neonate and Neonate: 40 to 60 per minute
      - Infants / Children: 12 to 20 per minute (one every 3 - 5 sec.)
  - If choking relieved, then follow AHA’s BLS Pediatric Healthcare Provider Algorithm
  - Suction as indicated (limit suction to 10 seconds in infants since suctioning may cause hypoxia and resultant bradycardia)
  - Administer O2 as indicated
    - If oxygen adjunct not tolerated administer blow-by O2 by holding a mask flowing 6 to 10 lpm in close proximity to the patient’s face
  - Prevent agitation of the child experiencing croup or epiglottitis
  - Infant Unconscious continued on next page
Specific treatment situations continued.

- **Foreign Body Airway Obstruction (FBAO) continued**
  - Infant Unconscious continued
    - Let the patient maintain a position of comfort as long as the airway is patent and there is no apparent risk of rapid deterioration
    - Ensure patient is properly restrained prior to transport
  - **Croup / Epiglottitis (stridor)**
    - Do not attempt IV / IO unless needed for resuscitation
    - Administer humidified O2 by placing 5 mL NS in a nebulizer attached to a face mask as tolerated
  - **Croup / Severe** (e.g., frequent barking cough, marked retractions, decreased breath sounds, significant agitation)
    - Neonate
      - Epinephrine 1:1,000 0.25 mg / kg nebulized in 3 mL of NS
        - Maximum single dose is 2.5 mg
    - Infant / Child
      - Epinephrine 1:1,000 0.25 to 0.5 mg / kg nebulized in 3 mL of NS
        - Maximum single dose is 3 mg
    - Attempt intubation only if the airway cannot be maintained by non-invasive procedures including BVM ventilation
  - **Reactive Airway Disease / Asthma (wheezing)**
    - Albuterol 2.5 mg and Atrovent 0.5 mg. Subsequent nebulizer treatments will contain only Albuterol 2.5 to 5 mg
    - If patient’s condition does not improve administer Epinephrine 1:1000 0.01mg / kg IM / SQ
      - Maximum total dose of 0.3 mg
    - If patient’s condition does not improve administer Magnesium Sulfate 25 to 50mg / kg IV / IO infusion (diluted in 100 mL NS infused over 15 minutes)
  - **Upper Respiratory Congestion**
    - Administer humidified O2 by placing 5 mL NS in a nebulizer attached to a face mask as tolerated
Pediatric Shock (255.12)
(Page 1 of 2)

Pediatric shock is recognizable by
- cool mottled skin;
- diminished pulses;
- altered mental status;
- increased capillary refill time (greater than 3 seconds);
- and tachycardia.

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Pediatric Guidelines (255.00)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2 or blow-by as tolerated
- Place patient in shock position (elevate lower legs 8-12 inches), if tolerated; otherwise, if breathing adequately and no trauma, place child in a position of comfort

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
  - Consider using the Broselow® Tape for fluid and medication infusion doses.
- NS should be used for volume resuscitation
  - The most common error in fluid resuscitation in children is the reluctance to provide adequate volume.
  - Desired effect is based on the patient’s clinical response
    - Decrease in heart rate
    - Improved pulse quality
    - Capillary refill time of 2 seconds or less
    - Warm extremities
    - Improved level of consciousness
    - Increase in systolic blood pressure
- Catecholamines (epinephrine / dopamine) are seldom indicated in the pre-hospital treatment of hypovolemic shock in children.
  - Contact receiving facility for guidance before administering
- Initiate transport. Perform focused history and detailed physical examination en route to the hospital, if patient status and management of resources permit.
- Reassess the patient frequently
- Consider specific treatment situations as detailed on the following page.
Pediatric Shock (255.12)
(Page 2 of 2)

Specific treatment situations.

- **Hypovolemic Shock** (vomiting, diarrhea, fever)
  - NS 20 mL / kg IV / IO
    - If the patient responds appropriately, repeat infusion to a maximum total of 60 mL / kg
    - If the patient does not respond, no additional infusions

- **Distributive Shock** (sepsis, anaphylaxis)
  - NS 20 mL / kg IV / IO, consider warmed NS
    - If the patient responds appropriately, repeat infusion to a maximum total of 60 mL / kg
    - If the patient does not respond, no additional infusions
  - Epinephrine infusion 0.1 to 1 mcg / kg / min
    - *Note: 1mg of 1:1,000 in 100mL of NS yields 10mcg / mL*
    - Titrated to a systolic BP of 90 mmHg

- **Cardiogenic Shock**
  - NS 5 to 10 mL / kg IV / IO - give over 10-20 minutes
    - Contraindication
      - *Fluid challenge contraindicated if there is evidence of congestive heart failure* (e.g., rales, pulmonary edema)
      - *DO NOT over hydrate patient*
    - If improvement in systolic BP noted, repeat dose
  - Epinephrine infusion 0.1 to 1 mcg / kg / min
    - *Note: 1mg of 1:1,000 in 100mL of NS yields 10mcg / mL*
    - Titrated to a systolic BP of 90 mmHg

- **Toxic ingestion / exposure**
  - NS 5 to 10 mL / kg IV / IO
    - If improvement in systolic BP noted, repeat dose

- **Diabetic Ketoacidosis**
  - NS 10 mL / kg infusion over 1 hour

- **Neonate**
  - Warmed NS 10mL / kg IV / IO
  - If the patient responds appropriately, repeat infusion ONLY ONCE
Pediatric Cardiac Arrest (255.14)
(Page 1 of 2)

Things to Know
Asystole and bradycardia are the most common pediatric rhythm disturbances. Children usually experience cardiopulmonary failure secondary to respiratory failure or shock and rarely due to primary cardiac disease or primary cardiac arrest.

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Pediatric Guidelines (255.00)
- Follow Airway Guidelines (215.00)
  - Ventilate with 100% O2
- Confirm apnea and pulselessness and administer CPR
  - Follow AHA’s Pediatric BLS Algorithm
  - Apply AED as soon as available.

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow the Modified PALS Pediatric Cardiac Arrest Algorithm on the following page
  - If patient presents in Asystole, confirm rhythm in more than one lead
- Follow Vascular Access Guidelines (220.00)
- Initiate transport
- Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit
- Search for and treat potential causes according to the appropriate protocols
  - H’s
    - Hypovolemia (Medical) or Hypovolemia (Trauma)
    - Hypoxia
    - Hydrogen ion (acidosis)
    - Hypo / Hyperkalemia
    - Hypoglycemia
    - Hypothermia
  - T’s
    - Toxins
    - Tamponade, cardiac
    - Tension pneumothorax
    - Thrombosis (coronary
    - or pulmonary)
    - Trauma
AHA’s Pediatric BLS Algorithm
Source: American Heart Association, Inc.

Pediatric BLS Healthcare Providers

1. Unresponsive
   - Not breathing or only gasping
   - Send someone to activate emergency response system, get AED/defibrillator

2. Lone Rescuer: For SUDDEN COLLAPSE, activate emergency response system, get AED/defibrillator

3. Check pulse: DEFINITE pulse within 10 seconds?
   - Definite Pulse
   - Give 1 breath every 3 seconds
   - Add compressions if pulse remains <60/min with poor perfusion despite adequate oxygenation and ventilation
   - Recheck pulse every 2 minutes

3A. No Pulse
   - One Rescuer: Begin cycles of 30 COMPRESSIONS and 2 BREATHS
   - Two Rescuers: Begin cycles of 15 COMPRESSIONS and 2 BREATHS

4. After about 2 minutes, activate emergency response system and get AED/defibrillator (if not already done).
   - Use AED as soon as available.

5. Check rhythm
   - Shockable rhythm?
     - Give 1 shock
     - Resume CPR immediately for 2 minutes
   - Not Shockable
     - Resume CPR immediately for 2 minutes
     - Check rhythm every 2 minutes; continue until ALS providers take over or victim starts to move

Note: The boxes bordered with dashed lines are performed by healthcare providers and not by lay rescuers

© 2010 American Heart Association
Modified PALS Pediatric Cardiac Arrest Algorithm
Source: American Heart Association, Inc.

Pediatric Cardiac Arrest

Shout for Help/Activate Emergency Response

1. Start CPR
   - Give oxygen
   - Attach monitor/defibrillator

2. VF/VT
   - Rhythm shockable?
     - Yes
     - VF/VT
     - Shock
     - CPR 2 min
       - IO/IV access
     - Rhythm shockable?
       - Yes
       - VF/VT
       - Shock
       - CPR 2 min
         - IO/IV access
         - Epinephrine every 3-5 min
         - Consider advanced airway
     - No
     - CPR 2 min
       - IO/IV access
       - Epinephrine every 3-5 min
       - Consider advanced airway

3. Asystole/PEA
   - CPR 2 min
     - IO/IV access
     - Epinephrine every 3-5 min
     - Consider advanced airway

4. CPR 2 min
   - Epinephrine every 3-5 min
   - Consider advanced airway

5. CPR 2 min
   - Amiodarone
   - Treat reversible causes

6. CPR 2 min
   - Epinephrine every 3-5 min
   - Consider advanced airway

7. CPR 2 min
   - Amiodarone
   - Treat reversible causes

8. CPR 2 min
   - Asystole/PEA
   - 10 or 11
   - Organized rhythm
   - Check pulse
   - Pulse present (ROSC)
   - Post-cardiac arrest care

9. Asystole/PEA
   - CPR 2 min
     - IO/IV access
     - Epinephrine every 3-5 min
     - Consider advanced airway

10. CPR 2 min
    - IO/IV access
    - Epinephrine every 3-5 min
    - Consider advanced airway

11. CPR 2 min
    - Asystole/PEA
    - CPR 2 min
      - IO/IV access
      - Epinephrine every 3-5 min
      - Consider advanced airway

12. CPR 2 min
    - Asystole/PEA
    - CPR 2 min
      - IO/IV access
      - Epinephrine every 3-5 min
      - Consider advanced airway

Doses/Details

CPR Quality
- Push hard (2/3 of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 15:2 compression ventilation ratio, if advanced airway, 8-10 breaths per minute with continuous chest compressions

Shock Energy for Defibrillation
First shock 2 J/kg, second shock 4 J/kg, subsequent shocks 2-4 J/kg, maximum 10 J/kg or adult dose.

Drug Therapy
- Epinephrine IO/IV Dose: 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration). Repeat every 3-5 minutes. If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- Amiodarone IO/IV Dose: 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VT/pulseless VT.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place give 1 breath every 6-8 seconds (6-10 breaths per minute)

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Spontaneous arterial pressure waves with intraarterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hypertension
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

*Century does not carry Amiodarone; give Lidocaine 1mg / kg IV / IO in lieu of Amiodarone.
**Give Magnesium Sulfate 25 – 50mg / kg IV / IO (maximum dosage is 2 grams) for Torsades de pointes or refractory V-fib
Pediatric Bradycardia (255.16)

(Page 1 of 2)

Pediatric Bradycardia is a heart rate less than the expected normal rate with signs or symptoms of poor systemic perfusion.

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Pediatric Guidelines (255.00)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2 or blow-by as tolerated
  - Look for signs of airway obstruction:
    - Absent breath sounds
    - Bradycardia (following hypoxia)
    - Choking
    - Drooling
    - Intercostal and suprasternal retractions
    - Stridor
    - Tachypnea

Paramedic.
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow the AHA’s Pediatric Bradycardia Algorithm on the following page
- Record and evaluate 12 Lead ECG (Give hard copy to receiving facility)
- If signs of severe cardiopulmonary compromise are present:
  - Administer 100% O2 and ventilate the patient
  - If patient is neonate to 1 year of age and the heart rate remains less than 60 despite O2 and ventilation, initiate chest compressions
- Follow Vascular Access Guidelines (220.00)
  - Do not delay transport to establish vascular access
- Determine BGL by finger stick, if not previously obtained
  - For BGL less than 60 mg / dl (neonate: less than 45 mg / dl) follow Pediatric Coma / Altered Mental Status Guidelines (255.06)
  - If signs of severe cardiopulmonary compromise persist identify and treat possible causes of bradycardia:
    - Hypoxia: Open airway, assist breathing
    - Hypothermia: Rewarm (patient compartment temperature, warm IV fluids)
    - Acutely Deteriorating Head Injury: (Posturing) Hyperventilate
    - Heart Block or Post Heart Transplant: Follow External Pacer Guidelines (240.00)
    - Toxin Ingestion: Follow Pediatric Overdose, Poisoning, or Ingestion Guidelines (255.20)
AHA’s Pediatric Bradycardia Algorithm
Source: American Heart Association, Inc.

Pediatric Bradycardia
With a Pulse and Poor Perfusion

1. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IO/IV access
   - 12-Lead ECG if available; don’t delay therapy

2. Cardiopulmonary compromise continues?
   - No
   - CPR if HR <60/min with poor perfusion despite oxygenation and ventilation

3. CPR if HR <60/min with poor perfusion despite oxygenation and ventilation
   - Yes

4. Cardiopulmonary Compromise
   - Hypotension
   - Acutely altered mental status
   - Signs of shock

4a. Support ABCs
   - Give oxygen
   - Observe
   - Consider expert consultation

5. Bradycardia persists?
   - No
   - Yes

5. Epinephrine
   - Atropine for increased vagal tone or primary AV block
   - Consider transthoracic pacing/transvenous pacing
   - Treat underlying causes

6. If pulseless arrest develops, go to Cardiac Arrest Algorithm

© 2010 American Heart Association

*Modified PALS Pediatric Cardiac Arrest Algorithm
Pediatric Tachycardia (255.18)
(Page 1 of 2)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Pediatric Guidelines (255.00)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2 or blow-by as tolerated

Paramedic.
- Airway / breathing management
  - If signs of respiratory distress, failure, or arrest refer to the appropriate guidelines
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow the AHA’s Pediatric Tachycardia Algorithm on the following page
- Record and evaluate 12 Lead ECG
  - The receiving hospital must receive a hard copy of the 12 Lead ECG
- Determine BGL by finger stick, if not previously obtained
  - For BGL less than 60 mg / dl (neonate: less than 45 mg / dl) follow Pediatric Coma / Altered Mental Status Guidelines (255.06)
- Follow Vascular Access Guidelines (220.00)
  - Do not delay transport to establish vascular access

Pediatric Tachycardia With Pulse and Poor Perfusion algorithm is on following page.
AHA’s Pediatric Tachycardia Algorithm
Source: American Heart Association, Inc.

*Century does not carry amiodorone or procainamide.*
Pediatric Overdose, Poisoning or Ingestion (255.20)

Poison Control 1-800-222-1222

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Pediatric Guidelines (255.00)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2 or blow-by as tolerated
- If breathing adequate, place child in a position of comfort
- Identify substance ingested, time of ingestion and if possible obtain the container of the ingested substance or pill bottles. *If identified contact Poison Control 1-800-222-1222.*

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Determine BGL by finger stick, if not previously obtained
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- If the child’s condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital, if patient status and management of resources permit.
- *Reassess the patient frequently*
- *Consider specific treatment situations listed below*

Specific treatment situations.

- **Beta Blocker Overdose**
  - **Albuterol 2.5mg nebulized**
  - Prevention / reversal of asystole, A / V block and depressed myocardial contraction
  - Symptomatic Bradycardia
    - **Epinephrine 0.1 mg / kg 1:10,000 IV / IO (0.01mg / kg 1:1,000)**
      - *Maximum single dose for a child is 1 mg*
      - *Maximum single dose for an adolescent is 1 mg*
      - **Repeat dose once**, if indicated
    - Consider cardiac pacing at an age appropriate rate

*Specific treatment situations are continued on the following pages.*
Treatment continued
Specific treatment situations continued.
• **Calcium Channel Blocker Overdose**
  o Symptomatic Bradycardia associated with Poisoning
    ▪ **Atropine 0.02 mg / kg IV / IO (minimum dose 0.1 mg)**
      • **Maximum single dose for a child is 0.5 mg**
      • **Maximum single dose for an adolescent is 1 mg**
      • **May repeat dose once**, if indicated
        o **Maximum total dose for a child is 1 mg**
        o **Maximum total dose for an adolescent is 2 mg**
    ▪ Consider cardiac pacing at an age appropriate rate
• **Dystonic Reactions (acute uncontrollable muscle contractions)**
  o **Benadryl 1 mg / kg IV / IO or deep IM (maximum single dose 50 mg)**
    ▪ **May not repeat**
• **Hypoglycemia (Symptomatic)**
  o Administer Dextrose
    ▪ Neonate **D10W 5 mL / kg IV / IO** for BGL less than 45 mg / dl
      • Refer to Pharmaceutical Reference for mixing guidelines
      • **To convert D50 into D10, dilute 10mL of D50 (5g) into 40mL of Normal Saline.**
    ▪ Infant / Child **D25W 2 mL / kg IV / IO** for BGL less than 60 mg / dl
      • Refer to Pharmaceutical Reference for mixing guidelines
      • **To convert D50 into D25, dilute 25mL of D50 into 25mL of Normal Saline.**
    ▪ Adolescent **D50W 1 mL / kg IV / IO** for BGL less than 60 mg / dl
      • **Maximum single dose is 12.5 grams**
      • Repeat BGL by finger stick in 5 minutes
        ▪ If BGL remains less than 60 mg / dl (for the neonate less than 45 mg / dl) after treatment and there is no change in mental status **repeat appropriate dextrose dose one time**
• **Magnesium Sulfate Overdose** contact receiving facility
• **Organophosphate exposure**
  o High dose Atropine is indicated in the unstable patient (goal is to improve respiratory difficulty and decrease secretions)
    ▪ **Unstable patient**
      • Administer **Atropine 0.05 mg / kg** (minimum initial dose 0.1 mg, maximum initial dose 2 mg) IV / IO
        ▪ **Repeat every 3 to 5 min** as needed until secretions dry
        ▪ **No maximum total dose**
• **Suspected Narcotic Overdose (with respiratory depression)**
  o **Narcan 0.1 mg / kg** (maximum single dose 0.5 mg) IV / IO / IM
    ▪ **If no improvement in 5 minutes may repeat initial dose once**
    o If respiratory improvement noted may repeat to a **maximum total dose of 2 mg**
Pediatric Overdose, Poisoning or Ingestion (255.20)
(Page 3 of 3)

Treatment continued
Specific treatment situations continued.

- Tricyclic Anti-Depressant [Amitriptyline (Elavil), Amoxipine (Ascendin), Clopramine(Anafrannil), Desipramine (Norpramin), Doxepin (Sinuquan), Imipramine (Tofranil), and Nortriptyline (Pamelor)]
  - If the patient experiences hypotension, seizures, ventricular arrhythmias or a wide QRS complex
    - Administer fluid challenge of NS 20 mL / kg (10 mL / kg for neonate) IV / IO
    - Sodium Bicarbonate 1 mEq / kg IV / IO initially
      - To repeat doses of Sodium Bicarbonate contact the receiving facility
  - If seizures develop
    - Valium 0.25 mg / kg IV / IO for active seizures
      - If vascular access is unavailable, administer Valium 0.5 mg / kg per rectum(PR)
      - Maximum single dose is 5 mg IV / IO / PR
      - If seizures persist, after 10 minutes, repeat dose once
      - Contact pediatric receiving facility for repeat doses
**Pediatric Drowning, Near-Drowning and Submersion (255.22)**

(Page 1 of 1)

**Treatment**

**Emergency Medical Technician.**
- Follow [EMT Assessment and Treatment Guidelines (210.04)]
- Follow [Pediatric Guidelines (255.00)]
- Follow [Airway Guidelines (215.00)]
  - Administer 100% O2 or blow-by as tolerated
- Protect from heat loss
  - Remove wet clothing if appropriate, cover with sheets or blanket to maintain body warmth

**Paramedic.**
- **All drowning or near-drowning patients will be transported without exception**
- Airway / breathing management:
  - Follow [Airway Guidelines (215.00)]
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow [Vascular Access Guidelines (220.00)]
- Initiate cardiac monitoring; record and evaluate ECG strip
  - Consult the appropriate guidelines for treatment of specific arrhythmias
- If the child’s condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
- Reassess the patient frequently
Occult conditions in pediatric patients are any condition where obvious injury or symptoms appear to be masked or benign. A physician does not discover occult conditions without evaluation, including hematology studies.

**Treatment**

**Emergency Medical Technician**
- Follow [EMT Assessment and Treatment Guidelines (210.04)](210.04)
- Follow [Pediatric Guidelines (255.00)](255.00)
- Follow [Airway Guidelines (215.00)](215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Treatment includes supportive measures, preventing deterioration, and reassuring the patient and family

**Paramedic**
- Airway / breathing management:
  - Follow [Airway Guidelines (215.00)](215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Determine BGL by finger stick, if not previously obtained
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow [Vascular Access Guidelines (220.00)](220.00) if indicated
Bites and Stings (260.00)
(Page 1 of 2)

Assessment
- Age and size of patient
- Location of injury
- Medical History
  - Medical illnesses
  - Medications
  - Allergies
- Time of bite
- Treatment provided prior to EMS arrival
- Type of snake (or other animal)

Signs and Symptoms
- Allergic reactions / Anaphylaxis
- Chills
- Dysphagia (difficulty swallowing)
- Fasciculations
- Headache
- Local pain and swelling
- Nausea / vomiting
- Paresthesia (numbness or tingling of mouth, tongue, other areas)
- Peculiar or metallic taste in mouth
- Skin
  - Bite wound location
  - Configuration
    - Distinct fang marks or puncture wounds
    - Entire jaw imprint
    - None
  - Local edema
  - Discoloration
- Vital Signs
  - Hypotension
  - Fever
- Weakness
Bites and Stings (260.00)
(Page 2 of 2)

Treatment

Emergency Medical Technician.

- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Consider specific treatment situation treatments shown below

Paramedic.

- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Allergic Reaction / Anaphylaxis Guidelines (230.10) if indicated
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Follow Vascular Access Guidelines (220.00)
- For pain management associated with bites and stings contact receiving facility
- Initiate cardiac monitoring; record and evaluate ECG strip

Specific treatment situations.

- Insects And Spiders
  - Remove stinger if present and cleanse
- Suspected Black Widow or Brown Recluse Spider
  - If patient exhibits signs and symptoms of shock, follow Hypotension / Shock Medical Guidelines (230.12)
- Marine Stings
  - Remove any clinging tentacles by salt water rinse (if available) or by using a gloved hand
    - Avoid rinsing with fresh water
  - Irrigate affected eye with NS or sterile water
  - If signs of allergic reaction noted follow Allergic Reaction / Anaphylaxis Guidelines (230.10) if indicated
  - Apply ice pack wrapped in gauze to affected area
- Snake Bites
  - If constricting bands in place upon arrival, remove
  - Attempt to identify type of snake and bring to receiving facility, if dead
  - Mark initial edematous area with pen and note time
  - Apply dry, sterile dressing
Alcohol Related Illness (260.04)
(Page 1 of 1)

Remember that alcohol impaired patients may have a serious underlying illness or injury which may be masked.

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- Determine BGL level by finger stick
  - For patients who exhibit signs and symptoms of hypoglycemia, are conscious and able to swallow, administer oral glucose or sugar orally for BGL less than 70 mg / dl
- Further interventions determined by underlying etiology

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Determine BGL by finger stick, if not previously obtained

Specific treatment situations.
- Symptomatic hypoglycemia
  - Thiamine 100 mg IV / IO / IM to all alcohol syndrome and malnourished patients prior to D50W administration
  - D50W 12.5 grams IV / IO for BGL less than 70 mg / dl
    - Repeat BGL by finger stick in 5 minutes
    - If no improvement and BGL is below 60 repeat D50W 12.5 grams
    - Note: Hyperglycemia resulting from the treatment of hypoglycemia is related to an increase in morbidity
- Coma or altered level of consciousness (ALOC)
  - Narcotic use
  - Respiratory depression, unable to protect airway, administer Narcan 0.5 mg IV / IO
    - If no change in 5 minutes, repeat Narcan 0.5 mg IV / IO
    - May repeat to a total dose of 4 mg
  - Remember the goal is to increase respirations, not LOC
- Unknown Etiology:
  - Consider other treatable neurological or metabolic disorders and if identified follow the appropriate guidelines
  - Assess temperature, 12 Lead ECG, SpCO, etc.
  - All unconscious patients of unknown etiology may be administered Narcan
**Toxic Ingestion / Exposure (260.02)**

(Page 1 of 5)

**Things to Know**


Miosis which means excessive constriction of the pupils

### Categories, Substances, and Overdose Effects

<table>
<thead>
<tr>
<th>Category</th>
<th>Substance</th>
<th>Overdose Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-Cholinergic Poisoning</td>
<td>• Atropine</td>
<td>Dry skin</td>
</tr>
<tr>
<td></td>
<td>• Scopolamine</td>
<td>Lethargy</td>
</tr>
<tr>
<td></td>
<td>• Anti-histamines</td>
<td>Dilated pupils</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hyperthermia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cardiac dysrhythmias</td>
</tr>
<tr>
<td>Anti-Psychotics</td>
<td>• Prochlorperazine (Compazine)</td>
<td>Dystonic reaction</td>
</tr>
<tr>
<td></td>
<td>• Promethazine (Phenergan)</td>
<td>Seizures</td>
</tr>
<tr>
<td></td>
<td>• Thorazine</td>
<td>Prolonged QT syndrome</td>
</tr>
<tr>
<td></td>
<td>• Prolixin</td>
<td>Sedation</td>
</tr>
<tr>
<td></td>
<td>• Haloperidol</td>
<td>Respiratory depression</td>
</tr>
<tr>
<td>Beta-Blockers</td>
<td>• Propranolol (Inderal)</td>
<td>Chest pain</td>
</tr>
<tr>
<td></td>
<td>• Atenolol (Tenormin)</td>
<td>Syncope</td>
</tr>
<tr>
<td></td>
<td>• Metroprolol (Lopressor)</td>
<td>SBP less than 90 mmHg</td>
</tr>
<tr>
<td></td>
<td>• Nadolol (Corgard)</td>
<td>Altered mentation</td>
</tr>
<tr>
<td></td>
<td>• Timolol (Blocadren)</td>
<td>Bradycardia with rate less than 60</td>
</tr>
<tr>
<td></td>
<td>• Labetolol (Trandate)</td>
<td>Heart block, including third-degree heart block and high grade second-degree heart blocks (e.g., Mobitz Type II second-degree)</td>
</tr>
<tr>
<td></td>
<td>• Esmolol (Brevibloc)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Acebutolol (Sectral)</td>
<td></td>
</tr>
<tr>
<td>Cyclic Antidepressants</td>
<td>• Maprotiline (Ludiomil)</td>
<td>Ludiomil is similar to Tricyclics.</td>
</tr>
<tr>
<td>(Tetracyclic)</td>
<td>• Amoxapine (Asendin)</td>
<td>Asendin produces mostly seizures</td>
</tr>
<tr>
<td></td>
<td>• Bupropion (Wellbutrin)</td>
<td>Minimal-moderate seizures</td>
</tr>
<tr>
<td></td>
<td>• Trazodone (Desyrel, Trazorel)</td>
<td>Less seizures and cardiac effects than tricyclics</td>
</tr>
</tbody>
</table>

Century Ambulance Service, Inc. • Medical Standard Operating Guidelines 224
### Categories, Substances, and Overdose Effects Continued

<table>
<thead>
<tr>
<th>Category</th>
<th>Substance</th>
<th>Overdose Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Combination Beta-Blockers</strong></td>
<td>Corzide (Nadolol / bendroflumethiazide)</td>
<td>Chest pain</td>
</tr>
<tr>
<td></td>
<td>Inderide (Propranolol / HCTZ)</td>
<td>Syncope</td>
</tr>
<tr>
<td></td>
<td>Inderide LA (Propranolol / HCTZ)</td>
<td>Systolic BP less than 90 mmHg</td>
</tr>
<tr>
<td></td>
<td>Lopressor HCT (Metoprolol / HCTZ)</td>
<td>Altered mentation</td>
</tr>
<tr>
<td></td>
<td>Tenoretic (Atenolol / Chlorthalidone)</td>
<td>Bradycardia with rate less than 60</td>
</tr>
<tr>
<td></td>
<td>Timolide (Timolol / HCTZ)</td>
<td>Heart block, including third-degree heart block</td>
</tr>
<tr>
<td></td>
<td>Ziac (Bisoprolol / HCTZ)</td>
<td>and high grade second-degree heart blocks (e.g., Mobitz Type II second-degree)</td>
</tr>
</tbody>
</table>

| **Selective Serotonin Reuptake Inhibitors (SSRI’s)** | Citalopram (Celexa) | Hypertension, |
| | Fluoxetine (Prozac) | tachycardia, agitation, |
| | Fluvoxamine (Luvox) | diaphoresis, shivering, |
| | Paroxetine (Paxil) | tremor, muscle rigidity |
| | Sertraline (Zoloft) | Malignant Hyperthermia |

| **Tricyclic Anti-Depressants** | Amitriptyline (Elavil, Endep, Etrafon, Vanatrip, Levate) | Hypotension |
| | Clomipramine (Anafranil) | Anti-cholinergic effects |
| | Doxepin (Sinequan, Zonalon, Triadapin) | (tachycardia, seizures, altered mental status, mydriasis) |
| | Imipramine (Tofranil, Impril) | AV conduction blocks |
| | Nortriptyline (Aventyl;Pamelor, Norvontyl) | Prolonged QT interval |
| | Desipramine (Norpramin) | Widened QRS |
| | Protriptyline (Vivactil) | VT and VF |
| | Trimipramine (Surmontil) | Polymorphic V-Tach |
| | Limbitrol (Amitriptyline + chlordiazepoxide) | (aka Torsades de Pointes) |
Toxic Ingestion / Exposure (260.02)
(Page 3 of 5)

Treatment

Emergency Medical Technician.
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer supplemental O2, maintain saturation between 95 and 100%
- If substance identified contact Poison Control at 1-800-222-1222 for assistance
  - Please note that all patient information requested by Poison Control must be given to them as per Florida Statute 395.1027(3)
- Notify local Fire Department and request Haz Mat Team for air monitoring and expertise

EMT Specific treatment situations.
- Organophosphate Exposure
  - Wear appropriate personal protective equipment (PPE) including masks, gloves and eye protection
    - Toxicity may result from inhalation or topical exposure
  - Decontaminate patient:
    - Remove clothing
    - Irrigate with NS; may also use soap and water
    - Contain run-off of toxic chemicals when flushing
  - Decontaminate equipment including the transport vehicle:
    - Haz Mat Team will determine when equipment or transport vehicle has been properly decontaminated
    - No equipment or transport vehicle will be used for any patient until determined to be free of contamination

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Vascular Access Guidelines (220.00)
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
  - For toxins ingested within 45 minutes, follow NG / OG Insertion Guidelines (215.02)

  - Initiate cardiac monitoring; record and evaluate ECG strip
  - Record and evaluate 12 Lead ECG
  - Consider PMD toxic ingestion / exposure specific treatment situations found on next pages
PMD toxic ingestion / exposure specific treatment situations.

- **Organophosphate Exposure**
  - **Mild Toxicity**
    - Symptoms
      - Blurred vision
      - Miosis
      - D.U.M.B.E.L.S. (Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Bronchospasm, Emesis, Lacrimation and Salivation)
      - Unexplained wheezing
      - Acute onset of stomach cramps
      - Abnormal heart rate
  - **Severe Toxicity**
    - Symptoms
      - Altered mental status, coma
      - Severe difficulty breathing
      - Confusion, psychosis
      - Involuntary urination / defecation
      - Seizures
      - Respiratory arrest
    - Follow [Coma / Altered Consciousness Guidelines (230.06)]
  - **Treatment**
    - If seizures are present follow [Seizures Guidelines (230.08)]
    - If symptom persist after 10 to 15 minutes:
      - **Atropine 2 to 4 mg** IV / IO every 3 to 5 minutes until secretions dry. No maximum dose.

- **Anti-Cholinergic Poisoning**
  - Follow [Coma / Altered Consciousness Guidelines (230.06)]
  - Follow [Seizures Guidelines (230.08)]
  - For signs of severe toxicity
    - Dilated pupils
    - Dry skin
    - Hyperthermia
    - Lethargy
  - Cardiac dysrhythmias
  - **Valium 2 mg** IV / IO / IM every 3 to 5 minutes to a maximum of **10 mg**

*Toxic ingestion / exposure specific treatment situations continued on next page.*
**Toxic Ingestion / Exposure (260.02)**  
(Page 5 of 5)

PMD toxic ingestion / exposure specific treatment situations continued.

- **Acute Dystonic Reaction to Anti-Psychotics**
  - Benadryl 25 mg IV / IM
    - Repeat Benadryl 25 mg IV / IM, if inadequate response in 10 minutes

- **Beta-Blocker Toxicity**
  - For patients with cardiovascular toxicity:
    - Albuterol 2.5 mg nebulized
  - For patients with severe cardiovascular toxicity:
    - Atropine 0.5 mg IV / IO while awaiting pacer
      - May repeat every 3 to 5 minutes as needed [Maximum dose 0.04 mg / kg OR 3 mg (whichever comes first)]
    - Follow External Pacemaker Guidelines (240.00)

- **Calcium channel blocker toxicity**
  - For patients with severe cardiovascular toxicity:
    - Atropine 0.5 mg IV / IO while awaiting pacer
      - May repeat every 3 to 5 minutes as needed [Maximum dose 0.04 mg / kg OR 3 mg (whichever comes first)]
    - Follow External Pacemaker Guidelines (240.00)

- **Tricyclic / Tetracyclic Anti-Depressant Toxicity**
  - If wide complex (QRS greater than or equal to 0.12 sec), hypotension or any arrhythmias:
    - Sodium Bicarbonate 1 mEq / kg IV / IO
  - If Torsades de pointes:
    - Pulseless
      - Magnesium Sulfate 2 gram IV / IO
    - With Pulse
      - Magnesium Sulfate 2 gram IV / IO infusion in 100 mL NS over several minutes
  - If Altered Mental Status:
    - Follow Coma / Altered Consciousness Guidelines (230.06)
  - If Seizures:
    - Follow Seizures Guidelines (230.08)

- **SSRI Toxicity**
  - If indicated follow Hyperthermia Guidelines (230.14)
    - Heat Stroke treatment
  - If indicated administer Narcan 0.5 mg IV / IO / IM
  - Determine BGL by finger stick, if not previously obtained
Specific Hazardous Materials Exposure (260.06)
(Page 1 of 16)

Poison Control (1-800-222-1222)

In all cases involving, or suspected to involve, hazardous materials the local EMS agency’s Hazardous Materials Team (Haz Mat Team) will be requested to respond, if not already assigned, via prompt communication with dispatch. Once on scene, employee will defer to the judgment and guidance of Hazardous Materials Team. Under no condition should an employee enter a suspected or confirmed contaminated zone until the Haz Mat Team has cleared the area for entrance.

Under no condition will treatment of a patient involving an airborne exposure where a self-contained breathing apparatus (SCBA) is required to enter the exposure area take place, up to and including attempting to remove a patient from the contaminated area, lest the rescuer become another casualty themselves. (Personal and scene safety is paramount in these situations as they are in all situations.) Some specific exposure examples are given in these protocols and the required use of an SCBA is notated in the EMT treatment section.

At all incidents, the U.S. Department of Transportation “Emergency Response Guidebook” (ERG) should be used to properly identify the agents involved. The ERG also contains an “orange” colored section in which basic treatment / supportive care can be found in the material is not referenced in these SOG’s (In many cases, the treatment for exposures will comprise only decontamination and supportive care.)

Specific treatment of some hazardous materials exposures are listed in the following pages.

These specific exposures include

- Anhydrous Ammonia Exposure
- Carbamate
- Carbon Monoxide
- Chlorine
- Cyanide
- Hydrofluoric Acid
- Hydrogen Sulfide
- Nitrites / Nitrates
- Phenol
Anhydrous Ammonia Exposure
Anhydrous Ammonia is commonly used as a commercial refrigerant. It is also used in water treatment plants and in other utilities. It is characterized by a strong pungent odor and is considered colorless.

**Signs and symptoms.**
- Cardiac arrhythmias
- Decreased LOC
- Hypotension
- Pulmonary edema
- Pulmonary irritation
- Seizures may be present
- Skin irritation and burns

**Treatment.**

*Emergency Medical Technician.*
- Protect employee from exposure
  - Do not attempt to extricate patient from scene as it requires use of an SCBA
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Decontamination
  - Remove patient’s clothing and jewelry
  - Wash patient with copious amounts of soap and water
  - Contain water run-off if practical

*Paramedic.*
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
Specific Hazardous Materials Exposure (260.06)
(Page 3 of 16)

Carbamate
Carbamate is an insecticide derived from carbamic acid that affects patients much the same way as organophosphates. Carbamates inhibit acetylcholinesterase and disrupt the parasympathetic nervous system.

**Signs and symptoms.**
- **D.U.M.B.E.L.S.** refers to Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Bronchospasm, Emesis, Lacrimation and Salivation
- **CNS effects**
  - Effects on the CNS system are not as severe as organophosphates because of the inability of carbamates to penetrate the central nervous system. Effects of carbamates usually last no more than 6-12 hours.

**Treatment.**

*Emergency Medical Technician.*
- Protect employee from exposure
  - *If safe to do so and possible, remove patient from source of contaminant*
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Decontamination
  - Remove patient’s clothing and jewelry
  - Remove dry product by brush or vacuum
  - Wash patient with copious amounts of soap and water
    - Contain water run-off if practical

*Paramedic.*
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- **Atropine 2 to 4 mg** IV / IO every 3 to 5 minutes until secretions dry. **No maximum dose.**
- **Consider transport to a hyperbaric treatment facility**
Carbon Monoxide

Carbon Monoxide (CO) is an odorless, colorless, tasteless, gas produced as a by-product of incomplete combustion. It crosses the alveocapillary membrane, enters the bloodstream, and then combines with hemoglobin to form carboxyhemoglobin preventing O2 from binding with hemoglobin causing cells to become O2 deprived. CO is classified as a chemical asphyxiant.

Assessment.
- Description of scene
  - Broken containers
  - Distinctive odors (not from the CO)
  - Enclosed space
  - Poor ventilation
  - Signs of fire or smoke
- Duration of exposure
- Medical History
  - Medical illnesses (especially prior cardiac or respiratory disease)
  - Medications
  - Allergies
- Nature of inhalant or combustible material
- Time since exposure

Signs and symptoms.
- Irritation / burning sensation in eyes, mouth, nose, throat and / or chest
- Nausea / vomiting
- Diminished vision
- Dizziness
- Headache
- HEENT
  - Singed nasal / facial hair
  - Soot in mouth or sputum
  - Pharyngeal inflammation
- Neurologic
  - Decreased level or loss of consciousness
  - Seizures
  - Coma
  - Behavior changes
- Respiratory:
  - Cough / wheezing
  - Dyspnea / labored breathing
  - Laryngeal edema (e.g., stridor, hoarseness, brassy cough)
  - Rales
  - Rhonchi
  - Vary increased or labored respirations or hypoventilation
Specific Hazardous Materials Exposure (260.06)
(Page 5 of 16)

Signs and symptoms continued.
- Skin
  - Thermal burns (particularly of face, mouth, throat and chest)
  - Cyanosis (cherry-red skin is not a reliable sign of CO poisoning)
- Vital Signs
- Weakness

Treatment.
*Emergency Medical Technician.*
- Protect employee from exposure
  - Do not attempt to extricate patient from scene as it requires use of an SCBA
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2 recording time O2 therapy was started
  - Note: SpO2 readings may be falsely high in the presence of significantly elevated CO levels. Do not be misled by "normal" SpO2 readings. Apply 100% O2 if any indication of toxic inhalation, significant flame or smoke exposure or respiratory distress noted. (Treat the patient, not the reading.)
- Decontamination:
  - Chemical residue will not provide cross-contamination. Haz-Mat Team will advise when treatment area is safe.
- See special considerations on following page.

*Paramedic.*
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Record and evaluate 12 Lead ECG
  - The receiving hospital must receive a hard copy of the 12 Lead ECG from crew
- Determine BGL by finger stick, if not previously obtained
- Follow Vascular Access Guidelines (220.00)
- For altered level of consciousness (ALOC), follow Coma / Altered Consciousness Guidelines (230.06) if appropriate
  - Consider Cyanide contamination / toxicity
    - Follow Cyanide protocols if indicated
- Consider transport to a hyperbaric facility if appropriate

*Special considerations are detailed on following page.*
Special considerations.

- *Multiple deaths commonly occur when improperly equipped persons attempt rescue in a confined space accident; DO NOT attempt rescue unless properly trained and equipped*
- If you suspect airway compromise due to an inhalation injury consider early intubation and Follow Airway Guidelines (215.00)
- Inhalation of toxic products of combustion or chemical irritants produces a variety of illness or, depending on nature and duration of exposure
- Many irritant gases (ammonia, nitrogen oxide, sulfur dioxide, sulfur trioxide) combine with water to form corrosive acid or alkali that causes burns of the upper respiratory tract with potential early upper airway compromise
- Signs and symptoms may be minimal or absent initially; fatal burns to respiratory tract may occur with little or no external evidence; non-cardiogenic pulmonary edema may develop as late as 24 to 72 hours after inhalation of some irritant substances
- Suspect airway injury for burns sustained in confined space, if facial burns or singing are present. Airway edema usually does not become severe until after the first hour, but it may develop rapidly in respiratory burns.
Specific Hazardous Materials Exposure (260.06)  
(Page 7 of 16)

Chlorine
Chlorine is utilized in industry as an oxidizer and a chlorinator. It is found in homes as well as in municipal water treatment facilities. It is a greenish yellow gas with a strong odor. A commonly found chemical used for cleaning.

**Signs and symptoms.**
- Cardiac arrhythmias
  - Tachycardia and ST segment changes
- Irritation
- Nervous system
  - Anxiety, agitation, confusion, coma
- Pulmonary irritation leading to edema
- Skin
  - Cool, pale and diaphoretic

**Treatment.**

*Emergency Medical Technician.*
- Protect employee from exposure
  - **Do not attempt to extricate patient from scene as it requires use of an SCBA**
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Decontamination
  - Remove patient’s clothing and jewelry
  - Wash patient with soap and copious amounts of water
    - Contain water run-off if practical

*Paramedic.*
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Treat pulmonary edema with positive-pressure ventilation
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Record and evaluate 12 Lead ECG
- Follow Vascular Access Guidelines (220.00)
- Irrigate eye exposures with ambient temperature NS for a minimum of 20 minutes
  - **Tetracaine 2 drops** to each eye before and after irrigation
    - **Dose may be repeated once in 10 minutes**
    - **After the administration of Tetracaine, the patient must be seen by a physician within 24 hours for additional treatment**
  - After irrigation cover both eyes with dry sterile dressing
Cyanide
Cyanide is a chemical asphyxiant that impedes O2 absorption into tissues at a cellular level by binding with cytochrome oxidase. It is found in industries such as metal plating, metal cleaning, plastics, and fertilizers. It is used as an insecticide and rodenticide and is given off by materials after they are on fire or smoldering. Materials that may emit Cyanide include polyurethane, polyacrylonitriles, nylon, wool, silk and many plants. Potassium cyanide used in the production of jewelry also represents an exposure hazard.

**Signs and symptoms.**
- **Mild toxicity**
  - Anxiety, confusion, unsteady gait, tachypnea
- **Moderate toxicity**
  - Cardiac arrhythmia, dyspnea, depressed LOC
- **Severe toxicity**
  - Loss of muscular coordination, convulsions, reflex bradycardia, respiratory depression and coma
- High Cyanide exposure levels may result in apnea, cardiovascular collapse and asystole
- The patient is usually not grossly cyanotic
- Ulcerations of the skin may be present

**Treatment.**
**Emergency Medical Technician.**
- Protect employee from exposure
  - **Do not attempt to extricate patient from scene as it requires use of an SCBA**
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Decontamination
  - Remove patient’s clothing and jewelry
  - Remove liquid product by blotting
  - Wash patient with mild soap and copious amounts of water

**Paramedic.**
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- **Contact the local fire department via dispatch to bring their Cyanokit® for immediate administration.**
- Follow Vascular Access Guidelines (220.00)
- Initiate cardiac monitoring; record and evaluate ECG strip
- **Consider transport to a hyperbaric facility if appropriate**
Hydrofluoric Acid
Hydrofluoric Acid is an inorganic acid in the same category as hydrochloric and sulfuric acid. It is commonly used in water treatment as a chlorinator as well as in the electronic manufacturing, plastics, pesticides, fire extinguisher, fertilizers and metals cleaning industries.

Things to know.
Hydrofluoric acid continues to injure the patient even after decontamination because the fluoride ion penetrates the skin and bonds with calcium and magnesium, causing continued injury with tissue and bone necrosis.

Signs and symptoms.
- Cardiac
  - Prolonged QT interval (widened QRS)
  - PVC’s
  - Peaked T waves
  - Torsades de Pointes
  - Tachycardia
- Cutaneous
  - Milk white to black appearance
  - Hardened with possible coagulation necrosis
  - Pain disproportionate to the injury
- Nervous system
  - Muscle tremors / cramps
  - Muscle tetany
  - Seizure
  - Anxiety, confusion, coma
- Respiratory
  - Bronchospasm
  - Laryngospasm
  - Airway edema

Treatment for hydrofluoric acid is detailed on the following page.
Specific Hazardous Materials Exposure (260.06)
(Page 10 of 16)

Treatment.

*Emergency Medical Technician.*

- Protect employee from exposure
  - If possible, remove patient from source of contaminant
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Decontamination
  - Remove patient’s clothing and jewelry
  - Remove solid product by dry decontamination
  - Remove liquid product by blotting
  - Wash patient with copious amounts of soap and water
    - Contain water run-off if practical
- Skin injuries
  - Flush exposed areas with copious amounts of water at low pressure

*Paramedic.*

- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Follow Vascular Access Guidelines (220.00)
- Follow Pain Management Guidelines (225.00)
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Initiate cardiac monitoring; record and evaluate ECG strip
  - Watch for arrhythmia due to the effects of fluoride ion absorption
Hydrogen Sulfide

Hydrogen Sulfide is a toxic, irritating gas, generated by the decomposition of organic material. It is commonly found in the petrochemical industry, water treatment plants, mining operations and liquid manure systems. A chemical asphyxiant, it’s mechanism of action is similar to cyanide. Odor is similar to a “rotten egg.”

Signs and symptoms by dose level.

- **Low Dose**
  - Bronchitis
  - Blepharospasm (Neurological movement disorder involving involuntary and sustained muscle contractions of the muscles around the eyes)
  - Conjunctivitis
  - Green / gray line in the gingiva (gums)
  - Headache
  - Tachycardia

- **High Dose**
  - Bradycardia
  - Hemoptysis (Coughing up blood)
  - Nausea / vomiting
  - Olfactory fatigue
  - Shortness of breath
  - Vertigo

- **Very High Dose**
  - AMI
  - Imminent death
  - Pulmonary edema
  - Seizures

Treatment for hydrogen sulfide exposure is detailed on the following page.
Specific Hazardous Materials Exposure (260.06)
(Page 12 of 16)

Treatment.

Emergency Medical Technician.
- Protect employee from exposure
  - Do not attempt to extricate patient from scene as it requires use of an SCBA
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Decontamination
  - Remove patient’s clothing and jewelry
  - Wash patient with copious amounts of soap and water
    - Contain water run-off if practical

Paramedic.
- Airway / breathing management:
  - Follow Airway Guidelines (215.00)
    - Treat pulmonary edema with positive-pressure ventilation
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Vascular Access Guidelines (220.00)
- Consider transport to a hyperbaric facility
Nitrites / Nitrates

Nitrites / Nitrates are found in both solid and liquid states, these chemicals are also commonly used as pharmaceuticals because of their ability to cause vasodilation (e.g., NTG). Nitrates and nitrites are also found in fertilizers (the most common source of exposure), polishes, photography, food preservation, dyes and paints. Nitrates and nitrites are also chemical asphyxiants.

**Signs and symptoms by dose level.**

- **Low Dose**  
  - Diaphoresis  
  - Dizziness / syncope  
  - Flushed skin  
  - Headache  
  - Hypotension  
  - Tachycardia

- **High Dose**  
  - Cardiovascular collapse (shock)  
  - Convulsions  
  - Cyanosis  
  - Dark chocolate brown blood (methemoglobinemia)  
  - Dizziness  
  - Headache  
  - Lethargy  
  - Metabolic acidosis

_Treatment for Nitrites / Nitrates exposure is detailed on the following page._
Specific Hazardous Materials Exposure (260.06)
(Page 14 of 16)

Treatment.

*Emergency Medical Technician.*

- Protect employee from exposure
  - If possible, remove patient from source of contaminant
- Follow [EMT Assessment and Treatment Guidelines (210.04)]
- Follow [Airway Guidelines (215.00)]
  - Administer 100% O2
- Decontamination
  - Remove patient’s clothing and jewelry
  - Remove dry product by brush or vacuum
  - Remove liquid product by blotting
  - Wash patient with copious amounts of soap and water
    - Contain water run-off if practical

*Paramedic.*

- Airway / breathing management
  - Follow [Airway Guidelines (215.00)]
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow [Vascular Access Guidelines (220.00)]
- Follow [Hypotension / Shock Medical Guidelines (230.12)] if indicated
Phenols are a class of aromatic organic compounds used in the manufacture of resins, weed killers, plastics, disinfectants and the extraction of solvents in the petroleum refining process. Phenols are colorless compounds (most are odorless) and may be found in a liquid, solid and gaseous state.

**Things to know.**
Phenols are caustic and cause injury to tissues through saponification (The conversion of fat into soap by the reaction with an alkali such as sodium hydroxide)

**Signs and symptoms.**
- Cardiac dysrhythmias (principally bradycardia)
- CNS effects (e.g., lethargy, seizures, coma)
- Diarrhea
- Hypotension
- Nausea / vomiting
- Profuse sweating (diaphoresis)
- Pulmonary edema
- Skin damage

*Treatment for Phenol exposure is detailed on the following page.*
Specific Hazardous Materials Exposure (260.06)
(Page 16 of 16)

Treatment.

Emergency Medical Technician.
- Protect employee from exposure
  - If possible, remove patient from source of contaminant
- Follow EMT Assessment and Treatment Guidelines (210.04)
- Follow Airway Guidelines (215.00)
  - Administer 100% O2
- Maintain body warmth / normothermia
- Decontamination
  - Remove patient’s clothing and jewelry
  - The principle treatment for the patient is to remove the contaminant because phenols are **NOT water soluble**
    - Decontaminate by applying an oil (e.g., olive, mineral, vegetable) if available on scene or isopropyl (rubbing) alcohol
  - After application of a decontamination solution, wash with soap and water and rinse for 15 minutes
    - Contain water run-off
- Contact Poison Control (1-800-222-1222) for more decontamination and treatment guidance

Paramedic.
- Airway / breathing management
  - Follow Airway Guidelines (215.00)
    - Record and monitor O2 saturation for all patients and end-tidal CO2 for intubated patients
- Initiate cardiac monitoring; record and evaluate ECG strip
- Follow Hypotension / Shock Medical Guidelines (230.12) if indicated
- Follow Seizures Guidelines (230.08) if indicated
- Follow Vascular Access Guidelines (220.00)
Century Ambulance Service, Inc. provides medical transportation for patients in all phases of medical care including pre-hospital and intra / post hospital care. This means that the likelihood of Century finding itself treating a patient suspected of carrying or confirmed to carry a Category A pathogen / agent is relatively high. Century has prepared for this scenario by creating the following Category A Infectious Pathogens / Agents Protocol to ensure that its crews and other employees are ready and able to deal with any situation that might arise.

Category A Infectious Pathogen Response Team Breakdown
Century has also created a response team comprised of specifically trained employees versed in dealing with Category A pathogens who are activated upon notification of such situations. The response team regularly meets to practice these situations and additionally takes part in facility drills in our regions to ensure our team is able to work seamlessly with each of our partner facilities / counties. This response team consists of:

- One (1) safety officer
  - The safety officer will not enter any contaminated area for any reason
- One (1) paramedic
- One (1) EMT or one (1) additional paramedic

On Scene Discovery of Suspected Category A Infectious Pathogen / Agent
After positive screening of a Category A Infectious Pathogen (CAIP) situation by any Century crew other than the designated Category A Infectious Pathogen response team the following protocols must be followed to minimize exposure and risk to the family and community:

1. Place a simple or procedure mask on the crew and the patient if tolerated.
2. Inform the family / staff member(s) that the Century is sending a specialized response team to handle the call
3. Remove all crewmembers and any family / staff members to safe areas (preferably outside if scene is a residence)
   - Patient’s family members are to be instructed to remain at the scene until contacted by Public Health or the receiving facility
4. Immediately contact shift / field command to activate the Category A Infectious Pathogen response team
5. In the event of sudden-death suspicious of a Category A Infectious Pathogen:
   - ONLY don the PPE according to the Donning Personal Protective Equipment Procedures (PPE) contained in this protocol (pertains to the response team)
   - The crew will immediately notify dispatch and field / shift command
     - If the response team is already on scene the safety officer will do this
   - Limit all interaction with the deceased’s remains, family / staff and scene
   - Advise all person(s) agencies on scene or arriving on scene of the suspicion of a possible Category A Infectious Pathogen prior to their entering the scene
     - If the response team is already on scene the safety officer will do this

Note: A positive screening may be made by either Century’s crew or the calling parties.
(Century provides primary response to Category A Infectious Pathogens / Agents for multiple 911 services in our region.)
Category A Infectious Pathogens / Agents Protocol (270.00)
(Page 2 of 10)

Unit and Equipment Preparation for Transport
1. The designated response team will carry out all preparatory activities
2. The designated response unit and equipment (including preparatory and decontamination supplies) will be picked up from field / shift command
3. The response equipment will include a CDC approved Ebola PPE for this purpose containing:
   - 2 - Protective suits
   - 2 - Face Masks
   - 2 - Powered Air Purifying Respirators (PAPR) units to include filters & tubing
   - 2 - Pair of rubber boots
   - 12 - pair of Forearm length gloves

Unit preparation
- Remove ALL equipment from the back of the unit (including compartments)
- Turn on the air conditioning throughout the unit to the lowest setting possible for the duration of the transport
  - This serves to reduce the activity of the pathogen while helping to make the PPE more bearable
- Cover the back of unit with visqueen (provided by field / shift command)
  - All visqueen will be cut to size and secured using supplied duct tape to provide a sealed barrier between the apparatus and treatment area under the direction of the safety officer or field / shift command.
- Once the unit has been sealed with visqueen the prepackaged supplies and equipment pertaining to patient care will be placed in the back of the unit
- Place the stretcher mattress inside the supplied impermeable bag

PPE Precautions
With all Category A infectious pathogens / agents PPE is paramount in driving patient care and protecting the community by ensuring the pathogen / agent is contained. In order to ensure that PPE precautions are followed without fail each crewmember must adhere to these protocols.

PPE precautions at scene
- Donning and Doffing of the CDC approved Ebola PPE must be done following the Procedures contained in this protocol
- The safety officer will ONLY drive, observe and instruct
  - They will NOT take part in patient care since they will not be wearing a full CDC approved treatment suit
- The safety officer must be the only one to open or touch any uncontaminated doors or objects after the crew has entered the contaminated area until the transport is complete and all PPE is doffed
PPE Precautions Continued

PPE precautions during transport.

- Limit invasive procedures (I.V. starts, nebulized meds, etc.) to only what is medically necessary
- Provide supportive care according to appropriate guidelines
- Do not remove protective gear for any reason
  - Exception: contamination breaching the suit
  - If the suit must be doffed, it must be done according to the Doffing Personal Protective Equipment Procedures (PPE)
- Medical report will be given by the sending facility PRIOR to patient departure
- The safety officer will determine the most suitable transport destination if not already determined by the sending facility
  - The following facilities are considered appropriate to receive suspected and confirmed Category A Infectious Pathogens / Agents patients in the pre-hospital setting for the regions we serve:
    - Baptist Medical Center – Downtown, Jacksonville, FL
    - UF Health Jacksonville, FL
    - UF Health at UF, Gainesville, FL
    - VA Medical Center, Gainesville, FL

PPE precautions upon arrival at hospital.

- Park the ambulance OUTSIDE of all covered areas
  - Shut the unit and box power off (regardless of outside temperature) to begin the 45 minute “settle time” prior to decontamination
  - All other standard parking protocols apply
- The safety officer will immediately report to triage for direction
  - The patient and crew providing care must remain in the ambulance until the safety officer clears the patient to exit the ambulance
- Discontinue nebulized medication; continue CPAP and other advanced airway management during transfer into patient care, isolation area
- Doffing of PPE after transfer of patient care will be completed at the destination facility’s designated area according to the Doffing Personal Protective Equipment Procedures (PPE) of this protocol
- Decontamination of the unit will be completed at the receiving facility according to the Unit / Equipment Decontamination Procedures of this protocol

Exposure precautions once transport is completed and PPE is doffed.

- Contact the field / shift commander immediately
  - The safety officer will be notified immediately by shift / field command and they will investigate and make a determination regarding any additional actions that are required as appropriate to the situation
- Each crewmember must fill out an exposure form via the company website detailing their potential exposure and actions to prevent contamination
Donning Personal Protective Equipment Procedures (PPE)

When donning PPE the following procedure should be followed step by step to ensure that the items perform as intended:

1. PPE is provided by field / shift command prior to the transport along with all necessary equipment
2. Use the restroom immediately prior to donning the PPE
   - By using the restroom prior to donning the PPE crewmembers are decreasing the likelihood they will need to use the restroom for the duration of the transport.
   - *This reduces the likelihood that the barrier will be inadvertently compromised*
3. Drink water
   - Drinking fluids prior to donning PPE ensures that the crewmember will not suffer due to the heat buildup caused by wearing the CDC approved PPE gear
4. Remove all adornments (e.g. rings, earrings, *watches*, etc.)
5. Change into surgical scrubs and rubber shoes
6. Inspect PPE for deterioration, tears or other issues that would render them ineffective
7. Perform hand hygiene
8. Don forearm length nitrile exam inner gloves
9. Don impervious suit
10. Don standard length nitrile outer gloves
11. Don PAPR apparatus including belt and battery pack
12. Power PAPR on to test the PAPR and battery pack to ensure full charge and effective ventilation
13. Don Mask and hood
14. Once a crewmember has donned their PPE they must have their partner and safety officer visually inspect them to verify the integrity of the gear
15. Disinfect outer gloves with hand sanitizer
16. *Once a crewmember has donned the PPE they must not remove any part of it until after patient care is complete* and then they must *ONLY doff the PPE according to the Doffing Personal Protective Equipment Procedures (PPE)* on the following page

Unit / Equipment Decontamination Procedures

Decontamination of the stretcher.

- *Decontamination of the unit will also take place at the destination facility by one (1) response team member designated to decontaminate the equipment, stretcher and unit (not necessarily the same crew that completes the transport)*
- Prior to decontamination of the stretcher or unit the designated crewmember will don a new set of PPE according to the *Donning Personal Protective Equipment Procedures (PPE)*
- Utilizing bleach wipes thoroughly clean and disinfect the stretcher and mattress cover
- Remove the mattress cover and isolate it by placing it into a primary biohazard bag along with all other used wipes and materials
- Utilizing bleach wipes thoroughly clean and disinfect the stretcher and mattress
Unit / Equipment Decontamination Procedures

Decontamination of the unit.
1. Allow for 45 minutes of settle time before decontaminating the unit
   - All ventilation and conditioning systems are off during this period
   - No one should enter the contaminated portion of the unit during this period
2. The designated crewmember will decontaminate the unit and stretcher and will be the only person entering the back of the unit during the decontamination procedure
3. Utilizing bleach wipes thoroughly clean and disinfect the contaminated unit and medical equipment prior to removal of the visqueen as follows:
   1. Utilizing bleach wipes thoroughly clean and disinfect ALL contaminated surfaces including the visqueen
   2. After all surfaces and equipment are disinfected, disinfect all removable equipment a second time and place them outside the unit until the unit is decontaminated to prevent recontamination
      - This will be accomplished by passing the equipment to a waiting crewmember wearing exam gloves without touching each other prior to the bleach drying
4. Once completed disinfected, remove the visqueen starting at the front of the patient care area by folding it towards the floor and back of the apparatus while ensuring to not touch previously isolated areas
5. Note, the crewmember assigned to decontaminate the unit will exit the unit with the visqueen and isolate it by placing it into the primary biohazard bag
6. After the visqueen is removed all previously protected areas should be thoroughly cleaned and disinfected utilizing bleach wipes
7. Note: The final layer of visqueen isolating the cab should be left in place until all previously protected areas are thoroughly cleaned and disinfected
8. Once the patient care area has been cleaned and disinfected as above the final layer of visqueen will be removed and placed into primary biohazard bag
9. The stretcher, unit and equipment is now considered decontaminated and safe to enter

Doffing Personal Protective Equipment Procedures (PPE)

Note: Crews will doff their PPE one at a time with the safety officer acting as eyes and ears (observer) to help ensure removal of contaminated PPE is completed safely

When doffing PPE the following procedure should be followed step by step to ensure that the crewmember does not contaminate themselves or anyone else during the doffing process:
1. The crewmember doffing their gear will turn slowly with the safety officer checking them for any obvious contamination, tears, or other risk factors
2. Disinfect PPE with bleach wipes
3. Disinfect outer gloves with sanitizer
4. Remove outer gloves one within the other being careful to minimize inner glove contamination and placed in a primary biohazard bag preplaced in the doffing area
Doffing Personal Protective Equipment Procedures (PPE) Continued

5. Inspect inner gloves for contamination, tears, etc.
   - If any tears are noted the inner gloves must be carefully removed, placed in the biohazard bag, hands must be sanitized and the inner gloves replaced
6. Disinfect inner gloves with sanitizer
7. Don a new pair of standard length nitrile outer gloves and disinfect them with sanitizer
8. Remove Hood
9. Disinfect outer nitrile gloves with sanitizer
10. Remove outer nitrile gloves one within the other being careful to minimize inner glove contamination and place them into the primary biohazard bag
11. Disinfect inner gloves with sanitizer
12. Don a new pair of standard nitrile gloves and disinfect them with sanitizer
13. Remove PAPR facemask and belt
14. Disinfect outer nitrile gloves with sanitizer
15. Remove outer nitrile gloves one within the other being careful to minimize inner glove contamination and place them into the primary biohazard bag
16. Disinfect inner gloves with sanitizer
17. Don a new pair of standard nitrile gloves and disinfect them with sanitizer
18. Carefully remove the impervious suit top to bottom keeping it away from the body while folding it inside out
   - Once removed gown is rolled and placed of into the primary biohazard bag
19. Disinfect outer nitrile gloves with sanitizer
20. Remove outer nitrile gloves one within the other being careful to minimize inner glove contamination and place them into the primary biohazard bag
21. Disinfect inner gloves with sanitizer
22. Don a new pair of standard nitrile gloves and disinfect them with sanitizer
23. Remove rubber boots
24. Disinfect outer nitrile gloves with sanitizer
25. Remove outer nitrile gloves one within the other being careful to minimize inner glove contamination and place them into the primary biohazard bag
26. Disinfect inner gloves with sanitizer
27. Remove inner gloves one within the other and place them in the primary biohazard bag
28. Disinfect hands with sanitizer
29. Sanitize the bare hands a final time
30. The safety officer then will perform a final visual inspection of the crewmember that doffed their PPE to ensure no obvious contamination has occurred or is present
31. **PPE is quarantined at the destination hospital (pending lab testing of patient) according to the following Biohazardous Waste Isolation and Disposal Procedures**
   - Any soiled staff uniforms or scrubs will be disposed of with the waste above at the destination facility
32. Shower facilities and clean scrubs will available from the hospital and will be utilized immediately following doffing the PPE
Biohazardous Waste Isolation and Disposal Procedures
All disposable waste (including visqueen) should be disposed of by:

1. **Note: The decontamination procedure requires multiple primary and secondary bags**
2. Placing the contaminated waste in a primary biohazard bag
3. Applying bleach into the biohazard bag to sufficiently cover the surface of the materials contained within the bag
4. Securely tying the bag by twisting the bag and then knotting the twisted section
5. Treat the exterior of the bag with bleach
6. Place the primary biohazard bag into a secondary bag
7. Tie the outer bag securely
8. Treat the exterior of the second bag with bleach
9. Place the second bag into the biohazard container ("green drum") provided by the destination facility

*Ebola specific protocols are detailed on the following pages.*
Ebola Specific Protocols
Century Ambulance Service, Inc. is providing this guidance in an effort to prepare its crews for the Ebola Virus Disease (EVD) outbreak in West Africa and the best methods to protect fellow healthcare workers (HCWs) and patients should a suspected or confirmed Ebola patient arrive or be discovered within Century’s area of operations. While EVD poses an extremely low risk to the counties and healthcare systems within our areas of operations, the frequency of international travel dictates that everyone should be prepared to respond to and treat potential EVD patients.

As a front line of defense, Century may be the first to interact with an exposed traveler from the currently affected countries (Guinea, Sierra Leone, Liberia, or Nigeria). **The most critical step to preventing transmission of EVD is identifying those persons that have traveled from those countries by simply inquiring on first contact if a person presenting for health services has traveled from affected countries in the last 21 days.** If the answer is affirmative, guidelines for management are presented below. As additional information is released from CDC or other sources, Century will release further iterations of this document to keep you up to date on EVD.

**Background.**
The EVD virus is classified as a viral hemorrhagic fever which produces a severe multisystem syndrome. Characteristically, the overall vascular system is damaged, and the body’s ability to regulate itself is impaired. These symptoms are sometimes accompanied by hemorrhage. Typically, EVD is characterized by sudden onset of fever and malaise, accompanied by other nonspecific signs and symptoms, such as myalgia, headache, vomiting, and diarrhea. Patients with severe forms of the disease may develop multi-organ dysfunction, including hepatic damage, renal failure, and central nervous system involvement, leading to shock and death. **The current recommended supportive treatment includes supportive therapy (IV fluids, blood transfusions, antibiotics to prevent secondary infections, etc.).**

**Assessment.**
An easy to follow **Ebola Recognition Algorithm** is located on page 10 of this protocol.

Person(s) whom you should consider at risk for Ebola includes any person who has **BOTH** consistent risk factors as follows:

- Within the past 21 days before the onset of symptoms, residence in, or travel within, the affected region of West Africa
- Has come into contact with blood or other body fluids or human remains of a patient known to have or suspected to have Ebola or who has had direct handling of bats, rodents, or primates from disease-endemic areas

**AND** meets the following clinical criteria:

- Fever of greater than 101.5° Fahrenheit (38.6° Celsius)
- Additional symptoms such as severe headache, muscle pain, vomiting, diarrhea, abdominal pain, or unexplained hemorrhage
Ebola Specific Protocols Continued

Treatment.

Recognition and transport of the nearest appropriate receiving facility as previously listed is the best route to give the patient the greatest possibility for a positive outcome.

All other treatments in the field are designed to assist the patient’s body in mitigating and handling the myriad of problems this disease will cause during the course of the infection. Additionally, field treatments serve to make the patient more comfortable and relaxed thus reducing the stress on the patient which has been shown to result in a higher potential for a positive outcome.

The current recommended treatment for Ebola includes supportive therapy (IV fluids, blood transfusions, antibiotics to prevent secondary infections, etc.).

- Note: There are no definitive treatments for the Ebola virus so all treatment will be based on supportive care
- Supportive treatments may be administered as appropriate and outlined throughout these medical SOG’s based on the condition, signs and symptoms of the patient.

An Ebola Recognition Algorithm is provided on the following page.
Ebola Recognition Algorithm

Does the individual have clinical symptoms?
- Sudden onset of fever >101.5°F (38.6°C)
- Intense weakness, muscle pain, myalgia
- Severe headache
- Pharyngitis, conjunctivitis
- Vomiting, diarrhea, abdominal pain
- Rash on chest, back, and/or stomach
- Unexplained hemorrhage (internal/external)

Within the last 21 days, does the patient have:
- History of travel to an Ebola Virus Disease (EBV) outbreak area
  - Guinea
  - Sierra Leone
  - Liberia
  - Nigeria
  - List as of August 14, 2014
- Occupational exposure such as:
  - Contact with suspect, probable or confirmed case of EBV
  - Direct handling of bats, rodents or primates with potential exposure
    - Working in a lab or facility handling EBV

Perform hand hygiene and don personal protective equipment (PPE) including:
- Impermeable gown
- N95 mask
- Eye protection and face shield
- Gloves
- Head and feet coverings
- Place simple mask on patient if tolerated

Upon discovery: Immediately contact dispatch AND the field/shift commander to inform of suspect/confirmed Ebola case. They will determine and contact the most appropriate receiving facility and activate Century’s designated Category A Infectious Pathogens/Agents response team to complete the transport.

During transport: Medical reports are given based on Medical Radio Reports (204.02)

Upon Arrival: Do not offload patient until the receiving facility staff confirms the path of movement of the patient throughout the hospital has been confirmed.
Authorized Pharmaceutical Reference (290.00)
(Listed in Alphabetical Order)

General Medication Policies

Drug Shortage Policy.
From time to time one of the pharmaceuticals Century carries on its units may not be available due to a national shortage. In the event this occurs Century will do one of the following:

- Cease carrying the drug for the duration of the shortage IF the drug in not required by the state and not deemed by the medical director to be a critical drug. (e.g. Atrovent)
- Provide an equivalent drug for use for the duration of the shortage IF the drug is required and is deemed critical. (e.g. Zofran ~ Phenergan)
- Provide instructions to convert another available drug concentration into the correct concentration for use for the duration of the shortage. (e.g. Epinephrine)

Unfortunately, with the current regulations and the limited number of producers there is likely to continue to be drug shortages on a regular basis within the United States. Century Ambulance Service, Inc. will change and adapt to these shortages to ensure that our crews are equipped to handle any emergency situation that may arrive despite any existing shortage.

Self-Medication Policy.
Crews are not to use medications on the units for personal use. This includes starting an IV and / or administering saline, Zofran, thiamine, or any other medication. Nor is another crewmember to do the above for any other on-the-job co-worker.

However, in the event of an asthma attack it is permissible to administer a breathing treatment, but the shift / field commander must be notified at that time. If any other medication is required shift / field command or the director of operations must be notified PRIOR to administration.

In the event of a true medical emergency appropriate measures and treatments may be taken according to the guidelines contained herein, however, the crewmember experiencing the emergency will then be transported by another unit to the ER for further evaluation and treatment. This will require a run and PCR be generated as the crew will be treated as a patient.

*Note: All cases of self-medication, no matter how minor, are considered incidents and field / shift command must be immediately notified and an incident report must be completed and.*

Facility Initiated / Ordered Medications
When a facility or physician initiates / orders dosing of a blood product, medication, etc. that is not carried on Century’s units nor addressed in these protocols the facility’s dosing instructions should be maintained unless a change in the patient’s status directly contraindicate its continuation. (e.g. active nitro drip and dropping blood pressure)

In the event the dosing is not covered in these SOG’s and the medication requires any potential titration or adjustment based on the patient’s response or a specified timeline a copy of the physician’s orders must be attained (order form, written and signed by physician on the field report, etc.), referenced in the PCR and included in the run’s scanned paperwork.
Adenosine (Adenocard)

Classification.
- Antiarrhythmic, Endogenous Nucleotide

Action.
- Adenosine slows conduction time through the A-V node. Interrupts the reentry pathways through the A-V node. Restores normal sinus rhythm in patients with paroxysmal supraventricular tachycardia (PSVT), including PSVT associated with Wolff-Parkinson-White Syndrome.

Indications.
- Stable paroxysmal supraventricular tachycardia (PSVT), including that associated with accessory bypass tracts (Wolff-Parkinson-White Syndrome) after appropriate vagal maneuvers (e.g., Valsalva Maneuver)
- Stable tachycardia’s which have a regular rhythm

Contraindications.
- Third degree heart block

Precautions.
- Ventricular fibrillation has been reported following Adenosine administration. In most instances, these cases were associated with the concomitant use of digoxin and less frequently with digoxin and verapamil. Although no causal relationship or drug-drug interaction has been established, Adenosine should be used with caution in patients receiving digoxin or verapamil and digoxin in combination.
- Cases of prolonged asystole, ventricular tachycardia, ventricular fibrillation, transient increase in blood pressure, bradycardia, hypotension, atrial fibrillation and bronchospasm have been reported in association with Adenosine use

Route of administration.
- IV

Considerations
- Record rhythm strip before, during and after administration

Adenosine dosage and side effects are detailed on following page.
Adenosine (Adenocard) Continued

Adult dosage.
- Initial Dose
  - 6 mg, over 1 to 3 seconds
  - Flush with 10mL NS
- Repeat Dose, if indicated
  - 12 mg, over 1 to 3 seconds
  - Flush with 10mL NS
- May repeat 12mg dose once more, if indicated
  - Maximum dose 30 mg 6+12+12

- Pediatric dosage.
  - Initial Dose
    - 0.1 mg / kg, over 1 to 3 seconds (Maximum first dose is 6 mg)
    - Flush with 10mL NS
  - Repeat Dose, if indicated
    - May double first dose and give only once (Maximum second dose is 12 mg)

Side effects.
- Cardiovascular
  - Chest pain
  - Facial flushing
  - Headache
  - Hypotension
  - Palpitations
  - Sweating
- Central Nervous System
  - Blurred vision
  - Burning sensation
  - Dizziness
  - Head pressure
  - Lightheadedness
  - Numbness
  - Neck and back pain
- Gastrointestinal
  - Nausea
- Respiratory
  - Chest pressure
  - Dyspnea
  - Hyperventilation
Albuterol (Proventil)

Classification.
- Relatively selective Beta2 - adrenergic bronchodilator

Action.
- Relaxes the smooth muscles in the bronchial tree

Indications.
- Beta Blocker Overdose
- Bronchospasm (wheezing or absence of breath sounds)
- Crush Syndrome

Contraindications.
- Any patient with a history of hypersensitivity to any of its components

Precautions.
- Albuterol should be used with caution in patients with cardiovascular disorders, hypertension, convulsive disorders, hyperthyroidism, diabetes and those with unusual response to sympathomimetic amines

Route of administration.
- Nebulizer

Considerations.
- EMT’s can assist a patient in the administration of the patient’s own prescribed metered dose inhaler
- In some patients, Albuterol may produce cardiovascular effects (e.g., increased pulse rate, increased blood pressure, palpitations and / or ECG changes)

Adult and pediatric dosage.
- Initial Dose
  - 2.5 mg (one unit dose). The first nebulizer treatment is mixed with 0.5 mg Atrovent. (See Atrovent pharmacology section and / or applicable respiratory treatment guideline)
- Repeat Doses
  - 2.5 mg as indicated

Directions and side effects are detailed on following page.
Albuterol (Proventil) Continued

Nebulizer directions.
- Add the medication into the nebulizer reservoir
- Connect the nebulizer reservoir to the mouthpiece or facemask
- Connect the nebulizer to O2
- Place the mouthpiece in patient's mouth, or place mask over mouth / nose
- Turn on O2 to activate nebulizer
- Have patient breath as calmly, deeply and evenly as possible until no more mist is formed in the nebulizer chamber
- Flow rate is regulated to suit the particular nebulizer (typically 8 LPM) or O2 delivery system so that the medication is delivered in approximately 5 to 15 minutes

Side effects.
- Cardiovascular
  - Arrhythmias
  - Palpitations
  - Hypertension
- Central Nervous System
  - Headache
  - Tremors
- Gastrointestinal
  - Nausea
- Respiratory
  - Dyspnea
  - Wheezing
  - Bronchospasm
  - Cough
Aspirin [acetylsalicylic acid] (ASA)

Classification.
- Antipyretic, platelet inhibitor

Action.
- Prevention of platelet aggregation

Indications.
- Ischemic cardiac events

Contraindications.
- Active GI bleeding
- Hypersensitivity to salicylates
- Third trimester pregnancy

Precautions.
- History of GI bleeding
- Use of Coumadin (warfarin)

Route of administration.
- PO (Mouth)

Adult dosage.
- 324 mg (4 chewable baby / children’s aspirin tablets)

Pediatric dosage.
- Not used in pediatrics in this system

Side effects.
- Cardiovascular
  - Anaphylactic shock
- Central Nervous System
  - Dizziness
- Gastrointestinal
  - Abdominal pain
  - Nausea
- Respiratory
  - Bronchospasm
Authorized Pharmaceutical Reference (290.00)
(Listed in Alphabetical Order)

Atropine Sulfate

Classification.
- Anti-Cholinergic
- Parasympatholytic (vagal blocker)

Action.
- Blocks vagal impulses, which may be responsible for brady-arrhythmias, (e.g., sinus bradycardia, sinus arrhythmia, sinus block or arrest, high degree A / V heart blocks and slow ventricular rhythms). Atropine accelerates the rate of discharge at the S / A node and speeds conduction through the A / V node, thus increasing the heart rate. Onset of action is within one minute and the peak of action is within 2 to 5 minutes.

Indications.
- Adults
  - Bradycardia
    - Atropine should be used only in those situations in which a bradyarrhythmia is accompanied by hypotension, decreased level of consciousness or frequent ventricular irritability
  - Organophosphate poisoning
- Pediatrics
  - Bradycardia
    - Atropine should be used only in those situations in which a bradyarrhythmia is accompanied by hypotension, decreased level of consciousness or frequent ventricular irritability
  - Toxins / Overdose including organophosphate poisoning
  - Endotracheal Intubation

Contraindications.
- Glaucoma (does not apply to arrest situations or organophosphate poisonings)
- Myasthenia gravis (abnormal condition characterized by the chronic fatigue and weakness of muscles, especially in the face and throat, caused by a lack of acetylcholine)

Precautions.
- Acute myocardial infarction
- Wide complex A / V blocks

Route of administration.
- IV / IO

Considerations, dosages and side effects are detailed on following pages.
Authorized Pharmaceutical Reference (290.00)
(Listed in Alphabetical Order)

Atropine Sulfate Continued
Considerations.
- Acceleration of the heart rate will result in increased myocardial O2 consumption, which can be harmful to the patient with acute MI or ischemia
- Adult doses of atropine less than 0.5 mg may further slow the heart rate
- Atropine may not be effective on all patients, particularly those with transplanted de-energized hearts and high degree heart blocks (3rd degree)
- Atropine pushed slowly may worsen the bradycardia

Adult dosage.
- Bradycardia
  - 0.5 mg; while awaiting pacer
    - Repeat every 3 to 5 minutes as needed [maximum dose 0.04 mg / kg OR 3 mg (whichever comes first)]
- Organophosphate Poisoning
  - 2 to 4 mg every 3 to 5 minutes until secretions dry; no maximum dose

Pediatric dosage.
- Bradycardia (with a pulse; if increased vagal tone or primary AV block)
  - 0.02 mg / kg
    - Minimum single dose infant is 0.1 mg
    - Maximum single dose for an infant is 0.5 mg
    - Minimum single dose for a child is 0.5 mg
    - Maximum single dose for an adolescent is 1 mg
    - May repeat dose once, if indicated
    - Maximum total dose for a child is 1 mg
    - Maximum total dose for an adolescent is 2 mg
- Endotracheal Intubation
  - 0.02 mg / kg IV / IO prior to intubation
- Toxins / Overdose (e.g., organophosphate, carbamate)
  - High dose Atropine is indicated in the unstable patient (goal is to improve respirations and decrease secretions)
    - If the patient is unstable, administer 0.05 mg / kg (minimum initial dose 0.1 mg, maximum initial dose 2 mg)
    - Repeat every 3 to 5 minutes as needed until secretions dry
    - No maximum total dose

Side effects are detailed on following page.
Atropine Sulfate Continued

Side effects.

- Cardiovascular
  - Tachycardia

- Respiratory
  - Dryness of the mouth, nose and throat
  - Increased respiration

- Central Nervous System
  - Blurred vision
  - Dilated pupils
  - Toxic doses may produce stupor and coma
Authorized Pharmaceutical Reference (290.00)
(Listed in Alphabetical Order)

Atrovent (ipratropium bromide)

Classification.
- Anticholinergic

Action.
- Bronchodilator, dries secretions

Indications.
- Bronchospasm (wheezing or absent breath sounds)

Contraindications.
- Hypersensitivity to atropine sulfate or its derivatives

Precautions.
- Sensitivity to peanuts (Only in some metered dose inhalers)
  - The ipratropium carried on Century units does NOT contain soy lecithin and is therefore safe to administer to patients with peanut allergies
    - This is a prime example of why a patient must ONLY be assisted in administering their own personally and specifically prescribed medications

Route of administration.
- Nebulizer

Considerations.
- EMT’s can assist a patient in the administration of the patient’s own prescribed metered dose inhaler
  - Sensitivity to peanuts (See Precautions above)

Adult and pediatric dosage.
- 0.5 mg in the initial nebulizer treatment ONLY. Subsequent nebulizer treatments will contain only albuterol.

Side effects.
- Respiratory
  - Coughing
  - Drying of bronchial secretions
- Central Nervous System
  - Blurred vision
  - Headache
- Gastrointestinal
  - Nausea
Benadryl (diphenhydramine)

**Classification.**
- Antihistamine / Antipruritic
- H1 inhibitor

**Action.**
- Benadryl is used to combat the symptoms of allergic or anaphylactic reactions by binding and blocking H1 histamine receptors

**Indications.**
- Allergic reaction
- Dystonic reaction

**Contraindications.**
- Acute asthmatic attacks

**Precautions.**
- Use cautiously in narrow-angle glaucoma, in neonates, asthma and hypertension

**Route of administration.**
- IV / IO
- IM

**Considerations.**
- CNS depression is worsened when using Benadryl in conjunction with alcohol, tranquilizers, sedatives, hypnotics and other CNS depressants
- Use of Benadryl in conjunction with MAO inhibitors causes an increase in anticholinergic effects (e.g., dry mouth, nose and throat)
- In anaphylaxis, use in conjunction with Solu-Medrol and Zantac

**Adult dosage.**
- **25 to 50 mg:** over 2 to 5 minutes

**Pediatric dosage**
- **Allergic Reaction:**
  - **1mg / kg (maximum single dose 25 mg):** over 2 to 5 minutes
    - May repeat once in 15 minutes (maximum total dose 50 mg)
- **Dystonic Reaction:**
  - **1mg / kg (maximum single dose 50 mg):** over 2 to 5 minutes
    - May not repeat

*Side effects are detailed on the following page.*
Benadryl (diphenhydramine) Continued

Side effects.

- Cardiovascular
  - Hypotension
  - Palpitations
  - Tachycardia
  - Arrhythmias

- Central Nervous System
  - Sedation
  - Seizures
  - Dizziness
  - Headache
  - Confusion
  - Restlessness
  - Excitation (children)
  - Nervousness
  - Tremors
  - Blurred vision

- Gastrointestinal
  - Vomiting
  - Diarrhea

- Respiratory
  - Tightness in the chest and wheezing
  - Thickening of bronchial secretions
  - Dry mouth, nose and throat
**Authorized Pharmaceutical Reference (290.00)**

(Listed in Alphabetical Order)

**Dextrose (D50W, D25W, D10W, paste / gel)**

**Classification.**
- Hypertonic glucose solution

**Action.**
- Corrects hypoglycemia in patients displaying a variety of symptoms of hypoglycemia (e.g., trembling, diaphoresis, seizures and coma)

**Indications.**
- Symptomatic hypoglycemia
  - Symptomatic Acute Stroke patient BGL less than 50 mg / dl
  - Adult BGL less than 70 mg / dl
  - Pediatric BGL less than 60 mg / dl
  - Neonate BGL less than 45 mg / dl

**Contraindications.**
- Hyperglycemia
- Intracranial and spinal hemorrhage
- Unconscious patients who cannot protect their airway (gel / paste)

**Precautions.**
- Cardiac or pulmonary disease
- Hypertension
- Renal insufficiency
- Check IV site frequently to prevent irritation, tissue sloughing, necrosis and phlebitis
- Ensure line is flushed adequately before and after administration
- Avoid extravasation

**Route of administration.**
- IV / IO (D50W, D25W, D10W)
- Oral (gel / paste only)

**Considerations.**
- EMT’s can administer dextrose gel / paste to the conscious patient that can swallow and maintain their own airway
- Do not use gel / paste on the patient who is unable to protect their airway
- Hyperglycemia resulting from the treatment of hypoglycemia is related to an increase in morbidity

*Dosages and side effects are detailed on the following page.*
Dextrose (D50W, D25W, D10W, paste / gel) Continued

Adult dosage.
- 12.5 grams D50W; administer over 2 to 5 minutes,
  - Maximum total dose is 25 grams
  - Hyperglycemia is related to increase in morbidity, therefore when treating hypoglycemia in adults, administer:
    - 12.5 grams of D50W
    - Repeat BGL by finger stick in 5 minutes
    - If no improvement and BGL is below 60 mg / dl repeat 12.5 grams of D50W
- 15 grams paste p.o. (one tube)
  - Repeat BGL in 15 minutes
  - If no improvement and BGL is less than 60 mg / dl may repeat 15 grams once

Pediatric dosage.
- Neonate
  - 5 mL / kg D10W; administer over 2 to 5 minutes
    - D10W: Expel 40 mL from the 50 mL D50W syringe and replace with 40 mL of NS in the 50 mL D50W syringe
- Infant / Child
  - 2 mL / kg D25W IV / IO; administer over 2 to 5 minutes
    - D25W: Expel 25 mL from the 50 mL D50W syringe and replace with 25 mL of NS in the 50 mL D50W syringe
- Adolescent
  - 1 mL / kg D50W IV / IO; maximum single dose is 12.5 grams
  - Repeat BGL by finger stick in 5 minutes
  - If BGL remains less than 60 mg / dl (for neonate less than 45 mg / dl) after treatment and there is no change in mental status repeat appropriate IV / IO dextrose dose once
  - Oral glucose is not used for pediatric patients in this system

Side effects.
- Cardiovascular
  - Diuresis (possibly causing dehydration)
- Central Nervous System
  - Spinal hemorrhage
- Endocrine
  - Hyperglycemia
Dopamine (Intropin)

**Classification.**
- Sympathomimetic inotropic agent and vasopressor

**Action.**
- Dosage-related
  - 5 to 10 mcg / kg / min
    - Stimulation of both beta-1 and alpha-adrenergic receptors, resulting in increased cardiac output
  - 10 mcg / kg / min or greater
    - Stimulation alpha-adrenergic receptors, resulting in renal, mesenteric, and peripheral arterial and venous vasoconstriction

**Indications.**
- Cardiogenic shock
- Septic shock
- Hemodynamically significant hypotension
- Bradycardia refractory to atropine

**Contraindications.**
- Pheochromocytoma
- Hypovolemic shock
- Tachydysrhythmias (includes V Fib)

**Precautions.**
- Patients receiving monoamine oxidase inhibitors (MAOIs) should receive no more than one-tenth of the normal dosage of dopamine
- Dopamine should not be discontinued abruptly but should be tapered gradually

**Route of administration.**
- IV / IO infusion

**Considerations.**
- Do not use paste on the patient who is unable to protect their airway
- Hyperglycemia resulting from the treatment of hypoglycemia is related to an increase in morbidity

*Dosages and side effects are detailed on the following page.*
Dopamine (Intropin) Continued

**Adult dosage.**
- Cardiac dose (cardiogenic shock and bradycardia):
  - 5 to 10 mcg / kg / min; titrate to systolic blood pressure of 90 mmHg
- Vasopressor dose (septic shock and hemodynamically significant hypotension):
  - 10 to 20 mcg / kg / min; titrate to systolic blood pressure of 90 mmHg

**Pediatric dosage.**
- *Not used in pediatrics in this system*

**Side effects.**
- Tachyarrhythmias
- Ectopic beats
- Nausea
- Vomiting

**Considerations.**
- Check IV site frequently to prevent irritation, tissue sloughing, necrosis and phlebitis
- Ensure line is flushed adequately before and after administration
- Avoid extravasation
- Administration of dopamine should be titrated to the desired hemodynamic effect (systolic blood pressure of 90 mmHg)
- **400 mg in 500 mL NS yields a concentration of 800 mcg / mL**
- **400 mg in 250 mL NS, 800 mg in 500 mL NS and 1600 mg in 1000 mL NS all yield a concentration of 1600 mcg / mL**
- Note that “street rules” for calculation of dopamine dose in drops per minute (weight in pounds, drop last digit, then subtract 1) are applicable only with concentrations of 1600 mcg / mL
- Dopamine is infused as a piggy back to normal saline
Epinephrine

Classification.
- Sympathomimetic (mimics sympathetic nervous system). Epinephrine is a hormone produced by the adrenal glands.

Action.
- Epinephrine stimulates both alpha and beta receptors and is an inotropic, chronotropic and dromotropic agent
- Effects the smooth muscles, therefore relaxing bronchial constriction and spasms
- Epinephrine is a physiological antagonist to histamine
- Epinephrine elevates perfusion pressure generated during cardiac compression, improves myocardial contractility, stimulates spontaneous contractions (such as in ventricular standstill) and increases myocardial tone, which is accompanied by conversion of a fine fibrillation to a coarser one, thus more susceptible to termination by defibrillation
- The following responses may be noted during resuscitation:
  - Increased heart rate (chronotropic effect)
  - Increased myocardial contractility (inotropic effect)
  - Increased systemic vascular resistance (alpha response)
  - Increased arterial blood pressure
  - Increased pulse pressure
  - Increased cardiac output
  - Increased coronary blood flow
  - Increased myocardial O2 consumption
  - Increased muscle irritability
- Onset is immediate; peak action 1 to 2 minutes; duration 3 to 5 minutes

Indications.
- Cardiac arrest Epinephrine should be given IV / IO early in the resuscitation effort
- Symptomatic bradycardia refractory to atropine, dopamine and transcutaneous pacing
- Anaphylaxis
- Bronchospasm not associated with CHF
- Angioneurotic edema
- Status asthmaticus

Contraindications.
- Pregnancy is a relative contraindication
- Hypertension
- Allergy to sulfites
- Pulmonary edema
- Evolving AMI

More information including dosages are detailed on the following pages.
Epinephrine Continued

Precautions.
- Do not expose ampules to light for prolonged periods
- Do not use if a reddish or brownish discoloration is noted
- May cause dilation of pupils and increased intraocular pressure, which may be harmful in patients with glaucoma
- Epinephrine will worsen such conditions as cerebral arteriosclerosis, hypertension, shock, ventricular arrhythmias and angina
- Do not mix epinephrine with any other drug, especially bicarbonate for epinephrine will be neutralized

Route of administration.
- IV / IO
- SQ / IM
- In pediatrics, SQ is preferred for non-resuscitation situations
- Brisk massage of the injection site will hasten the action of the drug

Considerations.
- Correct acidosis prior to administering epinephrine as it is less effective in an acidotic state
- Monitor the patient’s rhythm frequently

Adult dosage.
- **Asthma** (only if patient is less than 45 years old)
  - 0.3 to 0.5 mL 1:1,000 SQ / IM (0.3 to 0.5 mg)
- **Anaphylaxis / Allergic Reaction With Severe Systemic Reaction**
  - 0.3 mL 1:1,000 SQ / IM (0.3 mg)
  - 3 mL 1:10,000 IV / IO (0.3 mg) slow (at least 1 min)
- **Bradycardia / Cardiogenic Shock**
  - 1 mg 1:1,000 mixed into 100 mL NS (concentration = 10 mcg / mL) use a 60 gtts / mL infusion set
  - Administer 2 to 10 mcg / min
    - 15 gtts / min equals 2.5 mcg / min
    - 30 gtts / min equals 5 mcg / min
    - 45 gtts / min equals 7.5 mcg / min
    - 60 gtts / min equals 10 mcg / min
  - Titrate to a systolic BP of 90 mmHg
- **Cardiac Arrest**
  - 1 mg 1:10,000 IV / IO
  - Administered every 3 to 5 minutes during resuscitation

*Pediatric dosages and side effects are detailed on the following page.*
Epinephrine Continued

Pediatric dosage.

- **Asthma (as well as wheezing and reactive airway disease)**
  - 0.01 mL / kg 1:1,000 SQ / IM (0.01mg / kg)

- **Allergic Reaction**
  - 0.01 mL / kg 1:1,000 SQ / IM (0.01mg / kg)

- **Anaphylaxis With Hypotension**
  - 0.1 mL / kg 1:10,000 IV / IO (0.01mg / kg)

- **Cardiac Arrest / Symptomatic Bradycardia**
  - 0.1 mL / kg 1:10,000 IV / IO (0.01mg / kg)
  - Administered every 3 to 5 minutes during resuscitation

- **Cardiogenic Shock**
  - 1mg 1:1,000 mixed into 100mL NS (concentration = 10mcg / mL) use a 60 gtts / mL infusion set
  - Administer 0.1 to 1 mcg / kg / min
    - 6 gtts / min equal 1 mcg / min
    - 12 gtts / min equals 2 mcg / min
    - 18 gtts / min equals 3 mcg / min
    - 24 gtts / min equals 4 mcg / min
    - 30 gtts / min equals 5 mcg / min
  - Administer every 3 to 5 minutes during resuscitation
  - Titrate to maintain a systolic BP of 90 mmHg

- **Croup (Severe)**
  - Neonate
    - 0.25 mg / kg 1:1,000 nebulized in 3 mL of NS
      - Maximum single dose is 2.5 mg
  - Infant / Child
    - 0.25 to 0.5 mg / kg 1:1,000 nebulized in 3 mL of NS
      - Maximum single dose is 3 mg

Side effects.

- Pallor
- Nervousness
- Palpitations
- Anxiety
- Headache
- Sweating
- Elevated BGL
Etomidate (Amidate)

Classification.
- A non-narcotic, non-barbiturate sedative-hypnotic agent

Action.
- Main effect is to produce sedation. It may also lower intraocular and intracranial pressure, and lower the rate of cerebral O2 utilization.
- Onset within 1 minute and peak onset of 5 to 15 minutes

Indications.
- The non-cardiac / trauma arrest patient requiring endotracheal intubation

Contraindications.
- Known hypersensitivity to the agent
- The cardiac / trauma arrest setting

Precautions.
- Pregnancy

Route of administration.
- IV / IO

Considerations.
- As the agent can be irritating to vascular walls, a large venous site (e.g., antecubital) is preferred for IV administration, but is not required
- While etomidate is not associated with increased intracranial pressure (and may, in fact, decrease ICP), the pre-intubation use of lidocaine in patients with suspected head injury or increased intracranial pressure is recommended (if time allows)
- After administration of etomidate, limit stimulation / agitation of the patient to reduce the release of catecholamines which minimizes the desired effect of etomidate
- The elderly appear to be more sensitive to the effects than younger patients

Adult dosage.
- 0.3 mg / kg, over 30 to 60 seconds
  - If first dose not successful after 2 to 5 minutes, give second dose of 0.3 mg / kg
- In the elderly (65 years or older), consider an initial dose of 10 mg
  - If first dose not successful after 2 to 5 minutes, give second dose of 0.3 mg / kg up to a total single dose of 20 mg

Pediatric dosage.
- 0.3 mg / kg, over 30 to 60 seconds
  - If first dose not successful after 2 to 5 minutes, give second dose of 0.3 mg / kg, over 30 to 60 seconds
Etomidate (Amidate) Continued

Side effects.
- The most important side effect is myoclonus or diffuse muscle contraction, which may be very painful after the patient awakens
- Other Side effects include pain at the injection site, apnea, hypotension, tachycardia, Nausea / Vomiting
- It is important to note that etomidate does not cause analgesia, consider pain management
- Reflex sympathetic hypertension and tachycardia may be anticipated
Fentanyl (Sublimaze)
*Not carried on Century units*

**Classification.**
- Narcotic pain reliever
- Opioid analgesic

**Action.**
- Rapidly crosses the blood brain barrier acting on opioid receptors within the central nervous system thereby blocking pain signals
- Onset is immediate with a peak onset time of 10 minutes

**Indications.**
- Muscular skeletal injury
- Burns
- Abdominal / flank pain with a previously diagnosed cause

**Contraindications.**
- Sensitivity to Fentanyl
- Hypotension
- Severe respiratory depression

**Precautions.**
- Respiratory depressed patient
- Apnea (increased incidence in the elderly)
- Chest wall muscle rigidity associated with rapid administration and large doses

**Route of administration.**
- IV / IO
- IM

**Considerations.**
- Potent synthetic opioid (100 times more potent than morphine)
- Does not cause histamine release and has minimal depressant effects on the heart
- May decrease the dose by one half in elderly patients

*Dosages and side effects are detailed on the following page.*
Fentanyl (Sublimaze) Continued

Adult dosage.

- Burns
  - 1-2 mcg / kg; maximum single dose 200mcg
  - May repeat every 10 minutes until pain is classified as minor or until the systolic BP is less than 90 mmHg
- Muscular Skeletal and Abdominal Pain
  - 1 mcg / kg; maximum single dose is 100 mcg
  - May repeat ONCE in 10 minutes

Pediatric dosage.

- 0.5 mcg / kg; DO NOT exceed 100 mcg in a single dose

Side effects.

- Drowsiness
- Confusion
- Headache
- Nausea / vomiting
- Tremors
- Bradypnea / apnea
- Bradycardia
- Postural Hypotension
- Increased intracranial pressure
Labetalol (Normodyne)

Not carried on Century units

Things to know.
The C.A.R.D.I.O. mnemonic relates to the stimulation of the beta receptors will increase the following:
- Contractility
- Automaticity
- Rate
- Dilation of the coronary arteries
- Irritability
- Oxygen demand

Remember that labetalol is a beta blocker therefore it will produce the opposite effect.

Classification.
- Alpha / Beta-Blocker

Action.
- Blocks the response to beta stimulation in the body (C.A.R.D.I.O.)
- Contractility, Automaticity, Rate, Dilation (coronary arteries), Irritability, Oxygen demand
- Blocks the response to alpha stimulation in the smooth muscle of the vasculature which increases muscle tone
- May decrease heart rate and contractility
- Onset is in 5 minutes with a peak onset of 15 minutes

Indications.
- Symptomatic Hypertensive Urgency
- Narrow Complex Tachycardia refractory to Adenosine
- Atrial Tachycardia’s (e.g., A-Fib / A-Flutter)
- Irregular tachycardia’s
- Preeclampsia

More information including dosages are detailed on the following page.
Labetalol (Normodyne) Continued

Contraindications.
- Concurrent administration of Albuterol or Atrovent
- Signs and symptoms of end organ damage (e.g., chest pain, dyspnea)
- Severe bradycardia
- Hypotension
- 2nd or 3rd degree heart block
- Wheezing
- CHF
- AMI
- Acute stroke
- Unstable angina
- Recent drug use (specifically crack cocaine)

Precautions.
- May prevent symptoms of hypoglycemia
- History of Asthma or COPD
- History of tricyclic anti-depressants use (increases tremors)
- History of tagamet (Cimetidine) use increases effects of labetalol

Route of administration.
- IV

Considerations.
- The net effect is a decrease in blood pressure and myocardial oxygen demand
- Should be initiated cautiously in pediatric patients with careful dosage adjustments and monitoring
- Monitor heart rate and blood pressure
- May mask symptoms of hypoglycemia
- Use of labetalol in pregnancy may decrease the fetal heart rate

Adult dosage.
- 10 mg, over 2 to 5 minutes; may repeat in 10 minutes

Pediatric dosage.
- 0.5 mg / kg, maximum dose is 10 mg

Side effects.
- Dizziness
- Headache
- Edema
- Postural Hypotension
Lasix (Furosemide)

Classification.
- Potent loop diuretic

Action.
- Venodilation in 1 to 3 minutes from administration
- Lasix inhibits the reabsorption of sodium at the proximal and distal tubules of the kidney thus promoting diuresis
- Promotes the excretion of sodium, potassium and chloride
- Diuresis commences in 5 minutes after administration, reaches peak in 30 minutes and lasts up to 2 hours

Indications.
- Lasix may be used in the treatment of acute pulmonary edema and congestive heart failure

Contraindications.
- Dehydration
- Bladder obstruction
- Fever (typically an indication of pneumonia)
- Hypotension (SBP less than 90 mmHg)
- Known sensitivity

Precautions.
- Allergic reactions are possible, especially in those patients who are allergic to sulfa drugs or thiazide diuretics and those patients who are allergic to oral hypoglycemia agents
- Patients with nausea, vomiting or diarrhea
- Potassium depletion may pose a serious threat to patients with acute coronary heart disease and as well as those patients on digitalis therapy
- In Renal Failure patients who are treated with dialysis, Lasix should be withheld

Route of administration.
- IV / IO

Considerations.
- Anticipate the patient’s need to void
- Rapid administration may cause deafness
- Should be protected from light

Dosages and side effects are detailed on the following page.
Lasix (Furosemide) Continued

Adult dosage.
- **20 to 40 mg**, over 2 to 5 minutes
- If repeat doses are needed, contact receiving facility

Pediatric dosage.
- Contact receiving facility for direction

Side effects.
- Cardiovascular
  - Postural hypotension
  - Vascular thrombosis (especially in elderly or debilitated patients)
  - Embolism (especially in elderly or debilitated patients)
- Central Nervous System
  - Blurred vision
- Gastrointestinal
  - Nausea
  - Vomiting
- Respiratory
  - Consolidation of mucus leading to a mucus plug (especially in pneumonia)
**Authorized Pharmaceutical Reference (290.00)**

(Listed in Alphabetical Order)

**Lidocaine (Xylocaine)**

**Classification.**
- Anesthetic
- Antiarrhythmic

**Action.**
- Depresses ventricular irritability
- Useful in the suppression of dysrhythmias of ventricular origin since it decreases automaticity thereby slowing the rate of spontaneous phase 4 depolarization of the myocardial cells
- Reduces non-uniform recovery thus terminating re-entry to ventricular dysrhythmias
- Increases ventricular fibrillation threshold
- Lidocaine does not produce a significant fall in blood pressure, decrease myocardial contractility or diminish cardiac output
- Onset of action is approximately 2 minutes with a duration of approximately 10 to 20 minutes

**Indications.**
- Stable ventricular tachycardia
- Ventricular fibrillation / pulseless ventricular tachycardia
- Stable acute myocardial infarction (AMI) with ventricular ectopy including:
  - Multifocal PVC’s
  - Couplets / triplets
  - Bigeminy / trigeminy
  - Salvos
  - R on T phenomena
  - More than five PVC’s per minute
  - Short runs of V-tach
- Prior to intubation of suspected head trauma patients
- Anesthetize the nostril prior to NTI or NG tube insertion, if possible (lidocaine jelly)
- Anesthetize the pain receptors of the bone marrow canal (conscious / semi-conscious patient)

**Contraindications.**
- Known hypersensitivity
- Third degree heart block
- Sinus bradycardia with PVC’s

*More information including dosages are detailed on the following pages.*
Lidocaine (Xylocaine) Continued

Precautions.
- Caution should be used in patients with congestive heart failure, bundle branch blocks, hepatic disease, or hypovolemic shock
- Allergic reactions have occurred with the use of lidocaine
- Observe for signs of lidocaine toxicity (e.g., yellow vision, seizure)
- Lidocaine is rapidly metabolized by the liver and excreted via the kidneys. Therefore, conditions such as liver disease, severe renal disease, congestive heart failure, marked hypoxia, severe respiratory depression, hypovolemia or shock will increase the risks of toxic effects and require a reduced dose.

Route of administration.
- IV / IO
- IV / IO infusion
- Topical (jelly)

Considerations.
- Lidocaine should be used as a first line agent for PVC’s
- Lidocaine may be used as a first line agent for cardiac arrest or secondary to amiodarone
- May use jelly as a lubricant for NG / OG intubation
- Do not use jelly as a lubricant for oral ETT intubation

Adult dosage.
- **V-Fib and Pulseless V-Tach**
  - 1.0 to 1.5 mg / kg
  - Repeat every 3 to 5 minutes at 0.5 to 0.75 mg / kg to a maximum of 3 mg / kg
- **PVCs**
  - 1.0 mg / kg
  - Repeat every 5 to 10 minutes at 0.5 mg / kg to a maximum of 3 doses
- **Head / brain injury or stroke**
  - 1.5 mg / kg
- **Prior to intubation**
  - Infusion
    - 2 to 4 mg / minute
      - After successful resuscitation, a continuous infusion should be initiated, if converted with lidocaine
      - Use the pre-mix solution (contains 2 grams in 500 mL) with a 60 gtts / mL infusion set
        - Converted with one dose = 30 gtts / minute (2mg / minute)
        - Converted with two doses = 45 gtts / minute (3mg / minute)
        - Converted with three doses = 60 gtts / minute (4mg / minute)

  - **DO NOT use infusion therapy in the cardiac arrest setting**
Lidocaine (Xylocaine) Continued

Adult dosage continued.

- **Topical**
  - Liberally coat the nostril using a coated NPA or other method

- **After IO insertion**, before administering fluids or medication(s) in the conscious or semi-conscious patient only
  - 20 to 40 mg

Pediatric dosage.

- **V-Fib and Pulseless V-Tach (Secondary to Amiodarone), PVCs, and Prior to Endotracheal Intubation** (in patients with known or suspected head injury or stroke)
  - 1.0 mg / kg

- **Infusion**
  - 20 to 50 mcg / kg / min
    - Add 120 mg of lidocaine 100 mL of NS (1,200 mcg / mL)
    - Administer with a 60 gtts / mL infusion set
      - 20 mcg / kg / min infuse 1 gtt / min per kg
      - 30 mcg / kg / min infuse 1.5 gtts / min per kg
      - 40 mcg / kg / min infuse 2 gtts / min per kg
      - 50 mcg / kg / min infuse 2.5 gtts / min per kg
  - After IO insertion, before administering fluids or medication(s) in the conscious or semi-conscious patient only:
    - 0.5 mg / kg

Side effects.

- High doses may produce convulsions and respiratory arrest
- Usual doses may produce CNS reaction such as drowsiness, dizziness, visual disturbances, disorientation, euphoria, psychosis, etc.
- Overdose may produce hypotension, conduction disorders, heart block, cardiovascular collapse, facial paraesthesias and bradycardia
- Topical application (jelly) may cause localized irritation
Magnesium Sulfate 50% Solution

Classification.
- Smooth muscle relaxant, electrolyte, tocolytic (A medication that can inhibit labor and slow down or halt the contractions of the uterus)

Action.
- Magnesium prevents or controls convulsions by blocking neuromuscular transmissions
- Magnesium acts as a CNS depressant, however, it does not adversely affect the mother, fetus or neonate when used as directed for eclampsia or pre-eclampsia
- Magnesium acts peripherally to produce vasodilation, and stabilizes cardiac membranes to decrease propagation of arrhythmias
- With IV administration, the onset of anticonvulsant action is immediate and lasts about 30 minutes
- A respiratory smooth muscle relaxant

Indications.
- Torsades de Pointes
- Eclampsia
- Pre-eclampsia
- Bronchospasm
- Refractory V-Fib / V-Tach

Contraindications.
- AV blocks
- GI obstruction

Precautions.
- Do not administer unless solution is clear
- IV / IO use in eclampsia should be reserved for immediate control of life threatening convulsions

Route of administration.
- IV / IO

Considerations.
- The antidote for Magnesium Sulfate overdose is 8 to 16 mg / kg calcium chloride given IV / IO
- Normal Adult dose is 1 gtt / second using a 10 gtt infusion set

Dosages and side effects are detailed on the following page.
Magnesium Sulfate 50% Solution Continued

Adult dosage.
- **Torsades** (Pulseless)
  - 2 grams
- **Torsades with a Pulse**
  - 2 grams, infused in 100 mL NS over several minutes
- **Pre-Eclampsia**
  - 4 grams, infused in 100 mL NS over several minutes
- **Eclampsia**
  - 4 grams
- **Bronchospasm** (if no renal disease and CHF not suspected)
  - 2 grams, infused in 100 mL NS over several minutes for deteriorating asthma patients (status asthmaticus).

Pediatric dosage.
- **Torsades** (Pulseless)
  - 25 to 50 mg / kg
  - Maximum dose 2 grams
- **Torsades with Pulse**
  - 25 to 50 mg / kg
  - Maximum dose 2 grams
- **Bronchospasm**
  - 25 to 50 mg / kg, infusion in 100 mL of NS over 15 minutes for deteriorating or non-responding asthma patients (status asthmaticus)
  - Maximum total dose 2 grams

Side effects.
- Cardiovascular
  - Hypotension
  - Circulatory collapse
- CNS
  - Depressed reflexes
  - Flaccid paralysis
  - Hypothermia
- Respiratory
  - Respiratory paralysis
Morphine Sulfate

Classification.
• Narcotic analgesic

Action.
• Acts mainly as a CNS depressant to produce analgesia and sedation
• Increases venous capacitance
• Decreases venous return
• Decreases preload and afterload

Indications.
• Used to relieve moderate and severe pain
• It is the drug of choice for relieving pain associated with myocardial infarctions and may be useful in patients with acute pulmonary edema for its cardiovascular effects in relieving anxiety. Morphine causes pooling, thus reducing left ventricular stress and relieving pulmonary congestion. In addition, it decreases the myocardial O2 requirement.

Contraindications.
• Pulmonary edema resulting from chemical irritants
• Head injury
• Hypovolemic regardless of the origin
• Respiratory depression or insufficiency
• Undiagnosed abdominal pain
• Known hypersensitivity

Precautions.
• Morphine may cause allergic reactions
• In the setting of multi-system trauma closely monitor the patient’s BP

Route of administration.
• IV / IO
• IM

More information including dosages are detailed on the following page.
Morphine Sulfate Continued

Considerations.
- If hypotension develops, elevate the patient's legs
- Intramuscular
  - Peak analgesia occurs 30 to 60 minutes
  - Will adversely affect cardiac enzyme studies
- In MI patients
  - Morphine is not used in the field to attain total pain relief, but to make pain tolerable and reduce patient's fear
  - IV route is preferred
- Narcan, the antidote for narcotics, should always be readily available
- Vital signs (blood pressure, pulse, and respirations) are to be taken before and after narcotic administration
- Versed and morphine are compatible and may be administered together

Adult dosage. (40 kg or greater)
- 2 to 5 mg, may repeat initial dose every 5 min until one of the following occur:
  - Maximum dose of 10 mg is reached
  - Systolic BP drops to less than 90 mmHg
  - Respiratory depression becomes apparent
  - Pain or symptoms are resolved

Pediatric dosage. (less than 40 kg)
- 0.1 mg/kg, over 2 to 5 minutes, may repeat initial dose every 5 minutes until one of the following occur:
  - Maximum dose of 10 mg is reached
  - Systolic BP drops to less than 50 mmHg
  - Respiratory depression becomes apparent
  - Pain or symptoms are resolved

Side effects.
- Convulsions, nausea, vomiting or constricted pupils
- Hypotension in myocardial infarction
- Orthostatic hypotension (Decrease in blood pressure upon assuming erect posture)
- Respiratory arrest, shock, sinus bradycardia and cardiac arrest have occurred. IV administration increases the risk of these hazards.
- Respiratory depression occurs in almost every case but is not usually significant in patients with normal respiratory capacity
Narcan (Naloxone)

Classification.
- Narcan is an antagonist of opium derivatives and synthetic narcotics such as Morphine, Demerol, Dilaudid, Codeine, Percodan, Heroin, Lomotil, Darvon, Methadone, Oxycodone, Fentanyl and Talwin

Action.
- Competes to bind with opioid receptors blocking the effect of narcotics

Indications.
- Coma or seizures of unknown etiology
- Pinpoint pupils with altered mental status
- Respiratory depression induced by drugs

Contraindications.
- Known or suspected head injury

Precautions.
- Allergic reactions to Narcan are a possibility
- If the coma patient is intubated refrain from Narcan administration
- Patient may become combative upon reversal of narcotic effect

Route of administration.
- IV / IO
- IM

Considerations.
- Remember that airway management is first priority in any unconscious victim
- If severe respiratory depression from suspected narcotic OD, consider Narcan administration prior to intubation
- Narcan does not reverse barbiturate or cocaine overdoses
- Narcan is best-administered IV as it has the most rapid onset
- When given via IV, the onset of action is approximately 2 minutes

Dosages and side effects are detailed on the following page.
Narcan (Naloxone) Continued

Adult dosage.
- **0.5 mg**, over 2 to 5 minutes for IV / IO (3 seconds for IM)
  - If no change in 5 minutes, **may repeat initial dose**
  - May **repeat to a total dose of 4 mg**

Pediatric dosage.
- **0.1 mg / kg**, over 2 to 5 minutes for IV / IO (3 seconds for IM)
  - Maximum initial dose **0.5 mg**
  - If no change in 5 minutes, **may repeat initial dose**
  - May **repeat to a total dose of 2 mg**
- Broselow® Tape dosage may be utilized
  - **May not exceed total dose of 2 mg**

Side effects.
- Dilated pupils
- Tachycardia
- Vomiting
- Withdrawal symptoms possible if patient is a chronic user of narcotics
Nitroglycerin (Nitro Stat, Nitro Lingual, Nitro Paste)

**Classification.**
- Smooth muscle relaxant and vasodilator

**Action.**
- Nitroglycerin (NTG) has a direct vasodilator effect on coronary arteries, smooth muscles, the vascular beds, bronchioles and intestinal smooth muscles
- Reduces preload and afterload
- Onset of action is approximately 1 to 2 minutes with a duration of about 30 minutes

**Indications.**
- Angina pectoris
- Congestive heart failure (CHF) associated with respiratory distress
- Acute myocardial infarction

**Contraindications.**
- Systolic BP less than 90 mmHg
- Cerebral hemorrhage
- Hypovolemia

**Precautions.**
- If the patient has used erectile dysfunction medications within 24 to 72 hours and the systolic BP is less than 100 mmHg, contact the receiving facility for direction
- In the setting of an Inferior MI, NTG administration may result in hypotension
- If hypotension develops be prepared to administer fluid challenge per guidelines and place patient in shock position (elevate lower legs 8-12 inches). Patient must be closely monitored.

**Route of administration.**
- Sublingual (SL) spray
- Sublingual (SL) tablet
- Topical (anterior chest wall)

**Considerations.**
- Patient response to NTG varies greatly
- A drop in the systolic BP of 20 mmHg or more, consider withholding repeat doses
- If patient has history of angina, find out how many NTG tablets they have taken and whether or not they obtained any relief
- Check the expiration date of the patient’s prescribed NTG
- It is important to get a good history of the type of pain the patient is having
- Do to postural hypotension always assist the patient when standing from a supine or sitting position.
Nitroglycerin (Nitro Stat, Nitro Lingual, Nitro Paste) Continued

Adult dosage.
- **Nitro Stat, Nitro Lingual**
  - 0.4 mg, repeat at 3 to 5 minute intervals until the symptoms are relieved or systolic BP drops below 90 mmHg
- **Nitro Paste**
  - 1/2 – 2 inch to the anterior chest wall

Pediatric dosage.
- Not used in pediatrics in this system

Side effects.
- Cardiovascular
  - May cause decrease in blood pressure and increase the pulse rate
  - Syncope
  - Postural hypotension
- CNS
  - Marked flushing
  - Headache
Promethazine (Phenergan)

Classification.
- Phenothiazine derivative possessing antihistaminic, sedative, anti-motion sickness, antiemetic and anticholinergic effects.

Action.
- Promethazine is a phenothiazine antihistamine with sedative, antiemetic, and anticholinergic effects. It is a competitive histamine (H1) and alpha-adrenergic receptor antagonist.
  - Unlike other phenothiazine derivatives such as chlorpromazine, promethazine has limited effects at dopaminergic (D2) receptors. It produces antiemetic effects but is not useful as an antipsychotic.

Indications.
- Allergic reactions to blood products
- Adjunct to epinephrine in anaphylaxis
- Nausea and vomiting due to chemotherapy.
- Nausea and vomiting with moderate to severe dehydration or electrolyte imbalance.
- Prophylactic use prior to administration of pain management medication.
- To provide sedation, relief of apprehension

Contraindications.
- Comatose patient
- Hypersensitivity
- Intra-arterial injection. This will result in severe arteriospasm, gangrene and amputation of limb.
- Children <2 years old.
- Avoid in children whose signs and symptoms suggest Reyes syndrome or other hepatic disorder.

Precautions.
- Inspect drug for discoloration and particulate matter prior to use.
- Reduce dosage in patients over 60 years old.
- If patient complains of pain during IV injection, IMMEDIATELY stop injection and evaluate for possible arterial injection.
- CNS depression may make it dangerous to drive, operate equipment after receiving med.
- Contains sulfides which may cause allergic reactions, especially in asthma patients.
- Use with caution in patients with seizure disorders, as it lowers seizure threshold.
- Use cautiously if patient receiving any other CNS depressants or anticholinergics.
- Use with caution in patients with narrow angle glaucoma and in patients with cardiovascular or liver disease.
Promethazine (Phenergan) Continued

Route of administration.
- IV / IO
- IM
- Oral
- PR

Considerations.
- As detailed in precautions

Adult dosage.
- IV / IO: 12.5 mg SLOW IVP over 1 minute
- IM: 25mg (deep IM)
- Oral / PR: 25 mg

Pediatric dosage.
- IV / IO: 0.5 mg / kg SLOW IVP over 1 minute
- IM: 0.5 mg / kg (deep IM)
- Oral / PR: 0.5 mg / kg

Side effects.
- Drowsiness, dizziness, tinnitus, incoordination,
- Blurred vision
- Tremors
- Insomnia
- Seizures
- Hallucinations
- Tachycardia-bradycardia; increase or decrease in BP.
- May cause hyperexcitability in pediatric patients.
Propofol

Classification.
- Anesthetic / Sedation
- Short acting hypnotic

Action.
- Involves a positive modulation of the inhibitory function of the neurotransmitter gamma-aminobutyric acid (GABA) through GABAA receptors.

Indications.
- Anesthesia
- Sedation / ICU sedation in the intubated patient

Contraindications.
- Increased ICP
- Impaired cerebral circulation
- Lipid metabolism disorders
- Pediatrics
- Respiratory, renal, circulatory and hepatic diseases

Precautions.
- Hypersensitivity
- Use lower dose with the elderly, debilitated, or ASA-PS III
- Changes in doses should be made slowly (>5 min)
  - Monitor closely for cardiorespiratory depression

Route of administration.
- IV

Considerations.
- As detailed in precautions

Dosages and side effects of propofol are listed on the following page.
Authorized Pharmaceutical Reference (290.00)
(Listed in Alphabetical Order)

Propofol Continued
Adult dosage.
- Sedation Dose
  - 100-150 mcg / kg / min for 3-5 minutes followed by a maintenance infusion of 25-75 mcg / kg / min
- SICU Sedation in the intubated patient
  - 75 mcg / kg / min for at least 5 minutes; may increase by 5-10 mcg / kg / min every 5-10 minutes until desired level of sedation is obtained.
  - Maintenance infusion is 5-50 mcg / kg / min may be required.

Side effects.
- Bradycardia
- Arrhythmia
- Tachycardia (Peds)
- Hyperlipidemia
- Hypotention
- Apnea
- Rash / Puritis
Authorized Pharmaceutical Reference (290.00)
(Listed in Alphabetical Order)

Sodium Bicarbonate

Classification.
- Base chemical
- Electrolyte replacement

Action.
- Aids the buffering capacity of the body by neutralizing excess acid

Indications.
- PEA resulting from acidosis
- Metabolic acidosis (e.g., sepsis, ASA poisoning, Diabetic Ketoacidosis (DKA))
- Tricyclic anti-depressant overdose
- Hyperkalemia

Contraindications.
- Known or suspected alkalosis
- Hypoxic lactic acidosis

Precautions.
- Sodium bicarbonate should not be mixed with any other drugs; after injection, always flush IV / IO tubing thoroughly
- Sodium bicarbonate and epinephrine mixed together will inactivate the epinephrine
- Sodium bicarbonate and Dopamine mixed together will inactivate the Dopamine
- Sodium bicarbonate and calcium chloride mixed together will inactivate both medications and probably crystallize

Route of administration.
- IV / IO

Considerations.
- Avoid mixing any drug with sodium bicarbonate
- If possible, utilize a separate IV site solely for sodium bicarbonate administration
- It is very irritating to veins at the site of injection; thoroughly flush (at least 10 mL NS) IV / IO tubing after administration
- Prompt and effective ventilation is essential for the excretion of carbon dioxide produced by sodium bicarbonate administration

Dosages and side effects are detailed on the following page.
Sodium Bicarbonate Continued

Adult dosage.
- 1 mEq / kg, may repeat every 10 minutes
  - Repeat doses: 0.5 mEq / kg

Pediatric dosage.
- 1 mEq / kg, may repeat every 10 minutes
  - Repeat doses: 0.5 mEq / kg

Side effects.
- Over-dosage will cause alkalosis
Tetracaine (Pontocaine)

Classification.
- Local ophthalmic anesthetic

Action.
- Stabilizes membranes of conjunctival and corneal pain fibers to inhibit depolarization and perception of pain

Indications.
- Foreign body or toxic exposure (e.g., pepper spray)

Contraindications.
- Known hypersensitivity to tetracaine or other ophthalmic anesthetics
- Open ocular trauma

Route of administration.
- Topical

Considerations.
- Patient should be instructed to look up towards the top of the head while the paramedic pulls down the lower eye lid and administers the medication within the pouch formed by the inner surface of the lower eye lid and the conjunctiva
- Tetracaine does not dilate the pupil, paralyze gaze or accommodation or increase intraocular pressure
- Discolored solutions should not be used
- Containers must be kept tightly closed
- Warn patient not to touch or rub eye while cornea is anesthetized. This may cause corneal abrasion, further injury, and greater discomfort once tetracaine wears off.
- Patients considering refusal of transport should be cautioned that permanent eye damage may result if not examined and treated by a physician
- After the administration of Tetracaine, the patient must be seen by a physician within 24 hours for additional treatment

Dosages and side effects are detailed on the following page.
Tetracaine (Pontocaine) Continued

**Adult dosage.**
- 2 drops of 0.5% solution, may repeat every 10 minutes
  - Before and after irrigation

**Pediatric dosage.**
- Contact receiving facility

**Side effects.**
- Many patients experience a transient (less than 60 seconds) stinging or burning in the eye after administration of the medication
- Long term use can result in softening and damage to the cornea and sensitization to the agent (with increased chances of future allergic reactions)
Thiamine (B1)

Classification.
- Vitamin

Action.
- Assists in the metabolism of dextrose solutions
- Prevention of Wernicke’s Encephalopathy and Wernicke Korsakoff Syndrome

Indications.
- Prior to D50W administration in alcohol syndrome and malnourished patients with BGL less than 70 mg / dl and mental obtundation

Contraindications.
- Known hypersensitivity

Route of administration.
- IV / IO
- IM

Adult dosage.
- 100 mg

Pediatric dosage.
- Not used in pediatrics in this system

Precautions.
- None

Side effects.
- CNS
  - Feeling of warmth
  - Weakness
  - Restlessness
  - Tightness in throat
- Gastrointestinal
  - Nausea / vomiting

Considerations.
- Administer prior to D50W administration
Tissue Plasminogen Activator (TPA)

Classification.
- Thrombolytic

Action.
- Recombinant human tissue-type plasminogen activator (t-PA); produces local fibrinolysis
- Promotes thrombolysis by converting plasminogen to plasmin; plasmin degrades fibrin and fibrinogen

Indications.
- Acute Ischemic Stroke (within 3 hours after onset of stroke symptoms)
- Arterial Thrombosis & Embolism (including AMI and pulmonary embolism)
  - AMI
    - Chest pain (or equivalent) characteristic of myocardial ischemia for at least 15 minutes, unrelieved by NTG.
    - Electrocardiographic ST segment elevation of at least 1mm in at least two leads reflecting a single myocardial region (Q waves are not a contraindication); or ST depression in V1-3 of 3-4mm in presence of typical symptoms of MI (posterior infarction) or development of new bundle branch block.
    - Elapsed time from onset of continuous ischemic pain to presentation less than 6 hours unless clear-cut evidence of ongoing ischemia.

Contraindications.
- Active internal bleeding
- Suspected aortic dissection
- Prolonged (greater than 15 min.) or traumatic cardiopulmonary resuscitation
- Recent head trauma or known intracranial neoplasm
- Diabetic hemorrhagic retinopathy or other hemorrhagic ophthalmic condition
- Pregnancy
- Previous allergic reaction to thrombolytic agent (if using streptokinase or APSAC)
- Uncontrollable blood pressure greater than 200 / 120 mmHg
- History of any CVA
- Trauma or surgery less than 2 weeks
- Cardiogenic Shock
- Prior exposure to Streptokinase
- Minor
  - History of chronic severe hypertension with or without drug therapy
  - Active peptic ulcer
  - Significant liver dysfunction
  - Known bleeding diathesia or current use of anticoagulants
  - Recent venous or arterial sticks of non-compressible sites (ex-jugular)
  - Hemocult positive stools for blood
Tissue Plasminogen Activator (TPA) Continued

Route of administration.
- IV / IO

Instructions.
- Three (preferably four) peripheral intravenous lines should be established prior to administration of thrombolytic therapy (Sending facility will have already established the required lines prior to arrival).
  - This may be achieved with single lumen catheters. However, two double lumen catheters serve to limit the number of puncture sites and patient discomfort.
- TPA will typically be premixed upon arrival, however, mixing instructions are as follows:
  - Recombinant Tissue Plasminogen Activator (rt-PA) (50mg or 100 mg vial)
    - Dilute two 50mg vials (or one 100mg vial) of Activase (TPA) with 50cc sterile water without preservative (provided in the boxes) according to insert instructions. Transfer this volume into 100cc of D5@ or NS. The final volume (200cc) will provide a drug concentration of 0.5 mg / cc.
    - DO NOT FILTER.

Dosage.
- Physician orders will determine dosage of TPA, however, dosing is usually as follows:
- 90 minute protocol
  - Draw 30cc (15mg) from 200cc bottle.
  - Administer 30cc (15mg) direct IV push over 1-2 minutes.
  - Place the remaining 170cc (85mg) on IV volumetric pump and prime the tubing with Activase solution.
  - Calculate .75 mg / kg for patient up to 50 mg total. Infuse over 30 minutes.
  - Reset infusion to deliver .5 mg / kg over next 60 min. not to exceed 35 mg.
  - IV tubing can hold up to 20 cc of fluid (medication). Therefore, add 30 cc of D5W or NS to empty bottle / bag, and run at same rate in order to flush medication through the system.
  - When setting the infusion pump, when not using the facility’s pump, make sure you start with “volume infused” on zero (0). The thrombolytic medication infusion will be complete when the “volume infused” number on the pump equals the number of total cc’s for the thrombolytic dose.

Precautions.
- Unnecessary arterial / venous punctures should be avoided and all puncture sites should be compressed for at least 30 minutes and pressure dressing applied after discontinuation.
- Avoid use of automatic BP cuffs where previous venipunctures have been made.
- Greater than75 years of age (May still be given at physician’s discretion.)
Tissue Plasminogen Activator (TPA) Continued

**Side effects.**
- Arrhythmias
- **Bleeding / Hemorrhage (Monitor patient continuously for bleeding.)**
- Fever
- Low blood pressure
- Pleural effusion / edema (More common when treatment is for pulmonary embolism)

**Considerations when giving any thrombolytic.**
- Consider beta blockade if medicated.

**Thrombolytic Therapy Administration:**
Non-thrombolytic therapy-conventional management of ischemic chest pain is initiated concomitantly with the assessment for administration of thrombolytic therapy.
- Thrombolytic therapy-The following baseline laboratory tests should be obtained; however, therapy should not be delayed during blood sample analysis.
  - CBC
  - SMA-20
  - PT / PTT
  - Fibrinogen
  - Cardiac enzymes and isoenzymes
  - ECG
  - Chest X-ray
- **Patient should be continuously monitored in ECG lead that shows ST elevation to help assess efficacy of treatment**
  - A hard copy of the EKG strip must be left with the receiving facility

**Supporting medications.**
- **The following will likely be given PTA by the sending facility**
  - Give 60mg-325mg of PO aspirin as soon as MI is identified.
    - Rectal ASA may be given if patient is vomiting.
  - Heparin Therapy: To assure patency and decrease the incidence of rethrombosis following treatment with any thrombolytic agent
    - With TPA start heparin therapy immediately with a 5,000 unit bolus followed by a continuous infusion of 1,000 units / hour to maintain a PTT 1.5-2 times control.
    - With Streptokinase / APSAC, subcutaneous heparin 12,500 units Q 12 hours may be sufficient.
Valium (diazepam)

Classification.
- Anticonvulsant
- Benzodiazepine

Action.
- Central nervous system depressant, raises seizure threshold, sedative and skeletal muscle relaxant

Indications.
- Seizures, especially during status epilepticus
- Sedation and anxiety
- Severe muscle spasm

Contraindications.
- None in the emergency setting

Precautions.
- Anticipate respiratory depression and be prepared to ventilate and/or intubate the patient
- Chronically ill or bedridden patients are more susceptible to respiratory depression

Route of administration.
- IV / IO
- IM
- Per rectal (PR)

Considerations.
- If possible, avoid administering into small veins.
- Rare instances of allergic reactions have occurred.
- The onset of action is rapid following IV / IO administration and effects of an IV / IO dose may persist for as long as 3 hours; however, the blood level falls relatively quickly, so patients may seize again within 10, 15 or 30 minutes following the initial dose
- Valium readily passes the placental barrier with the concentration of the drug in the fetal circulation approaching that in maternal circulation

Dosages, directions and side effects are listed on the following pages
Authorized Pharmaceutical Reference (290.00)
(Listed in Alphabetical Order)

Valium (diazepam) Continued

Adult dosage.
- 2 to 10 mg, administer over 2 to 5 minutes IV / IO (3 seconds for IM / PR)
  - Maximum total dose 10 mg
    - To exceed maximum dose contact the receiving facility

Pediatric dosage.
- IV / IO / IM:
  - 0.25 mg / kg, administer over 2 to 5 minutes IV / IO (3 seconds for IM)
    - Maximum single dose is 5 mg
  - May repeat dose in 10 minutes; maximum total dose 10 mg
    - To exceed maximum total dose contact the receiving facility
- Per rectal (PR)
  - 0.5 mg / kg
    - Maximum single dose is 10 mg
  - May repeat dose in 10 minutes; maximum total dose 10 mg
    - To exceed maximum total dose contact the receiving facility

Directions
- Rectal administration of Valium
  - Indications.
    - Unable to establish vascular access
    - Patient in status seizure activity
  - Equipment needed
    - 18 gauge needle
    - 10 mL syringe
    - 14 gauge IV catheter
    - Valium ampule or prefilled syringe
    - KY jelly
  - Procedure
    - Attach 18 gauge needle to the Carpuject® syringe
    - Draw 8mL of NS in a 10mL syringe
    - With 8mL NS in syringe, draw plunger back to the 10mL mark (leaving 2mL of air inside the syringe).
    - Insert the Carpuject® syringe needle into the tip of the syringe and into the 8mL of NS (Placing the needle in the NS ensures adequate mixing occurs.)
    - Inject 2 mL of Valium into the syringe, (concentration is now 1 mg / mL)
    - Calculate proper dose based on individual patient
    - Remove the needle (stylet) from a 14 gauge IV catheter (dispose of sharps)
    - Attach the 14 gauge IV catheter (without needle) to the same 10 mL syringe
    - Place the patient on side with knees bent forward, if possible
    - Lubricate catheter with KY jelly
    - Insert the entire catheter into rectum and administer until seizure activity stops or dose administered
Valium (diazepam) Continued

Side effects.

- Respiratory
  - Respiratory depression

- CNS
  - Fatigue
  - Drowsiness
  - Headache
  - Weakness
  - Slurred speech
  - Blurred vision
**Versed (midazolam)**

**Classification.**
- Sedative
- Short acting benzodiazepine
- CNS depressant

**Action.**
- CNS depression with skeletal muscle relaxation and induction of amnesia
- Calms the patient by increasing the activity of the natural neurotransmitters via gamma-aminobutric acid (GABA) for sedation due producing endorphins leading to a state of calm

**Indications.**
- Endotracheal intubation
- Pacing of conscious patients
- Cardioversion
- Anxiety management

**Contraindications.**
- Intolerance to benzodiazepines
- Hypotension

**Precautions.**
- High doses or rapid administration may cause hypotension; administer over 2 to 5 minutes
- Consider lower dose in the elderly

**Route of administration.**
- IV / IO
- IM

**Considerations.**
- Repeat dosing (per specific guideline) may be indicated to maintain sedation, however the patient must be normotensive (normal blood pressure)

---

*Dosages and side effects are detailed on the following page.*
Versed (midazolam) Continued

Adult dosage.
- Sedation
  - 2 to 5 mg, may be repeated per specific guideline
    - In elderly patient’s administer the medication in 1 mg increments
- Orotracheal intubation
  - Maximum of 0.3 mg / kg

Pediatric dosage.
- 0.1 to 0.2 mg / kg to a maximum dose of 4 mg, may be repeated per specific guideline

Side effects.
- Cardiovascular
  - Profound hypotension
- Respiratory
  - Coughing
  - Laryngospasm
- CNS
  - Excessive sedation
- Gastrointestinal
  - Nausea / vomiting
Zofran (ondansetron)

**Classification.**
- Anti-emetic

**Action.**
- Decreases serotonin action on the brain by blocking 5-HT3 serotonin receptors, thereby decreasing nausea and / or vomiting
- Peak onset is in 30 minutes

**Indications.**
- Nausea / vomiting

**Contraindications.**
- Sensitivity to the medication
- Apomorphine (Apkoyn)

**Precautions.**
- May result in prolonged QT segment (Long QT Syndrome)

**Route of administration.**
- IV / IO
- IM

**Considerations.**
- Avoid in patients who are allergic to phenylalanine (found in most foods and aspartame).
- If the patient is possibly dehydrated, administer a fluid challenge first.

**Adult dosage.**
- 4 mg, administer over 2 to 5 minutes
  - Do NOT repeat dose

**Pediatric dosage.**
- 0.5 mg / kg, maximum single dose is 4 mg
- Do NOT repeat dose

**Side effects.**
- Headache / dizziness
- Malaise / fatigue
- Anxiety / agitation
- Shivering
The following terms are defined specifically for use in the “Medical Standard Operating Guidelines”

**Analgesic** - A substance that relieves pain

**Antagonist** - A chemical substance that blocks the effects of specific receptor sites or drug

**Blow-By O2** - A technique of delivering oxygen by holding a face mask or similar device near an infant’s or a child’s face; used when another delivery device is not tolerated or appropriate

**BVM** - Medical abbreviation for “Bag-valve-mask” and “Bag-valve-tube”

**Chemical Asphyxiant** - A substance that prevents the uptake / use of oxygen by the cells

**CNS** – Medical abbreviation for “Central Nervous System”

**Dystonic Reaction** – A neurological movement disorder which produces muscle contractions, twitching and repetitive movements; also known as extrapyramidal symptoms

**Elderly** - Persons with a chronological age of 65 or greater

**ETCO2** - Medical abbreviation for expired End-tidal Carbon Dioxide

**Fluid Challenge** - The use of fluids to resuscitate a patient based on the need to maintain cerebral perfusion, which requires the maintenance of a systolic BP of 90 mmHg

**HEENT** - Medical abbreviation for “head, ears, eye, nose and throat”

**Hypertension** - Blood pressure reading greater than that which is normal for the patient

**Hypertensive Urgency** - Systolic BP greater than 220 mmHg and diastolic BP greater than 120 mmHg, with or without symptoms

**Hypnotic** - A medication that depresses CNS activity reducing anxiety, irritability or excitement and induces sleep

**Hypoxic Lactic Acidosis AKA Respiratory Acidosis** - Acidosis that is caused by retention of carbon dioxide, due to inadequate pulmonary ventilation or hypoventilation and that results in a decrease in blood pH unless compensated for by renal retention of bicarbonate
IM Medical abbreviation for “intramuscular” injection of medication

IV The medical abbreviation for “intravenous.” Where the SOP indicates IV therapy (vascular access), the use of an INT is an acceptable alternative if the patient does not need fluid

Lpm Medical abbreviation for “liters per minute”

**Mechanism Of Injury** The process of looking at an accident and determining what injuries are likely to have resulted from the forces and motion and changes in motion involved. Always consider the kind of force, its intensity and direction and the area of the body affected.

**Metabolic Acidosis** Decreased pH and bicarbonate concentration of the body fluids caused either by the accumulation of excess acids stronger than carbonic acid or by abnormal losses of bicarbonate from the body

**Needle Thoracentesis** Procedure for inserting an angio-cath into the pleural space to relieve a tension pneumothorax

**Pleuritic** Relates to inflammation of the pleura; the serous membrane investing the lungs (visceral pleura) and lining the walls of the thoracic cavity (parietal pleura)

**Postural Hypotension** Decrease in blood pressure upon assuming erect posture

**Pheochromocytoma** An adrenal gland tumor that produces excessive amounts of epinephrine and norepinephrine

**Recovery Position** Placement of a non-traumatic unconscious or semi-conscious patient in a left lateral recumbent position in order to facilitate drainage of fluids from the mouth to reduce the risk of aspiration

**SQ** Medical abbreviation for the “subcutaneous” injection of medication

**Subcutaneous Emphysema** A physical finding of air within the subcutaneous tissue