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MEDICAL CARE PROTOCOL
GENERAL CONSIDERATIONS
CHAPTER 24.1.1

Issued: May 2010

Revised: July 12, Dec 14, May 15 Submitted By: EMS Branch Approved By: Medical Director

The following standards of care shall apply to all patients treated by Alachua County Emergency Medical System

All patients are to be **treated with respect**.

An individual becomes a **patient** when presenting with a chief complaint or evidence of a medical condition or injury or upon discovery of vital signs outside normal values.

Consultation with an on-line medical control physician prior to initiation of non-life threatening therapeutic modalities outside the context of these protocols remains the standard. **The sole exception is being life-saving care.** Life-saving care is defined as any or all measures which having the purpose of immediate preservation of life and/or the establishment of means by which life might be preserved. The Medical Control Physician shall be defined as the emergency department attending physician at Shands Teaching Hospital.

Patient care is by nature unpredictable and patients may require care derived from multiple protocols, or in the absence of these, on-line medical control. The following protocols are written with this reality in mind. Deviations from protocol will be tolerated only when it is intended to further patient care. Such deviations must in no way detract from the high level of patient care expected from pre-hospital care providers associated with Alachua County's EMS system.

All patients transported will be secured to the stretcher with three (3) straps one of which must be the Torso/Waist Restraint.

The CAB's (circulation, airway, breathing) will always take priority in patient management. maneuvers required to secure the airway, ensure adequate gas exchange, and establish adequate tissue perfusion should always supersede specific protocol statements.

The patient's condition will mandate how often vital signs are obtained;

For a **CRITICAL PATIENT**, every 5 minutes;

For a **NON-CRITICAL PATIENT** every 10 minutes and if a transport is greater than one hour, every 15 minutes.

Two sets of vital signs shall be obtained on all transported patients with temperatures required on the following; Abdominal Pain, Altered Mental Status, Apparent Life Threatening Event, Heat Illness, Hypertension, Hypothermia, Overdose and Poison Ingestion, Sepsis, STEMI, and Stroke.

Orders communicated directly from the on-line Medical Control Physician to the paramedics caring for the patient may supersede established protocol.

The Company Officer of each unit is responsible for the completion of a patient care report on every patient contact, regardless of treatment administered. Paramedics will complete ALS reports and EMT's may complete BLS reports at the discretion of the Company Officer.

Complications, problems, or requests for additional orders during treatment will be directed to the on-line Medical

Control Physician. Additional questions or problems should be directed to the Medical Director after the incident.

Emergency responders functioning at the BLS level will be expected to conform to Alachua County's BLS Medical protocols to the extent that their training and certifications allow.

Although it is our policy and desire to be of assistance to law enforcement, requests by law enforcement for collection of blood samples to screen for alcohol or drug levels will be honored when, in the best judgment of the paramedic in charge of the patient, assisting law enforcement in such a manner would not delay patient transport, care, nor violate the Citizen's rights of refusal.

An Alachua County Fire/Rescue ALS unit may cancel their response by any of the following means:

- The requester calls back and advises that they no longer need EMS to respond
- Another Advanced Life Support (ALS) unit arrives on the scene and determines additional ALS units are not needed.
- LEA or a Basic Life Support (BLS) unit advises there is no patient

NOTE: The only recognized reason for cancellation by another Public Safety Agency is for "no patient on the scene". The Medic unit will continue response for a minor injury or for a patient refusing treatment.

MEDICAL CARE PROTOCOL
RADIO REPORT
CHAPTER 24.1.2

Issued: May 2010

Revised:Mar 12, July 12 Submitted By: EMS Branch Approved By: Medical Director

It is understood that some pre-hospital situations preclude providing a complete report to the destination facility. However, paramedics should strive to furnish a complete report at the earliest possible opportunity with deviations from this standard being for the benefit of the patient.

MEDICAL COMMUNICATIONS

The following information should be communicated on initial contact by the paramedic with the hospital or with the On Line Medical Control Physician (OLMCP).

1. Unit Identification number
2. Patient's age and gender
3. Patient's chief complaint/Time of onset
4. Brief history relevant to the chief complaint /illness, medications used, allergies
5. Vital signs (as appropriate for circumstances)
6. Description of the mechanism of injury for traumatized patients
7. General appearance, including the Glasgow coma scale
8. Pertinent physical findings
9. Treatment rendered and the response to treatment
10. Request for orders needed and confirmation of any orders given
11. Estimated time of arrival (ETA)

If transported patient is critical and the paramedic is occupied treating the patient, an abbreviated report may be given by either the paramedic or the driver (Driver's Report).

If medical radio contact is not available

1. Attempt contact by phone via the use of a recorded line at the Combined Communication

Center (CCC)

2. Route a message through CCC via dispatcher

3. Follow protocol as written

MEDICAL CARE PROTOCOL
INITIATION OF CPR
CHAPTER 24.1.3

Issued: May 2010

Revised: July 12 Submitted By: EMS Branch Approved By: Medical Director

All patients found in cardiopulmonary arrest by EMS personnel will receive cardiopulmonary resuscitation (CPR). CPR will be initiated using the American Heart Association standards for adults, children or infants.

Exceptions:

- A patient who has in his or her possession, or at the bedside, a completed, legal, yellow State of Florida Do Not Resuscitate Order (HRS Form 1896).
  - If there is any question about the validity of the DNR document, the Paramedic shall contact the on-line medical control physician at Shands. Until there is a clear understanding as to the validity of the order, CPR will be performed.
- Any patient who presents as obviously dead. (See Determination of Death, Chapter 24.1.4)

Cardiopulmonary resuscitation may be halted when:

- Effective spontaneous ventilation and circulation have been restored as per 2010 AHA ECC guidelines
- Resuscitation efforts have been transferred to persons of no less skill than the initial providers
- The rescuer is exhausted and physically unable to continue resuscitation.

All criteria has been met per Protocol 24.1.4

MEDICAL CARE PROTOCOL
DETERMINATION OF DEATH
CHAPTER 24.1.4

Issued: May 2010

Revised: July 12 Submitted By:EMS Branch Approved By: Medical Director

The EMS team does not pronounce death; rather, it is **determined** to exist.

What to look for:
Death is determined to be present if all of the following are evident:

- Unresponsive
- Pulseless
- Apneic
- Absence of electrical activity on cardiac monitor in 2 or more leads

- Additionally, **at least one of the following** will be present to determine that death has occurred:
    - Lividity, rigor mortis, or generalized cyanosis
    - Decomposition of body tissue
    - Decapitation, incineration
    - Destruction of brain or heart
- Once it is determined that death has occurred, the EMS team will request/notify LEA.
- The body will not be left unattended until LEA is present.
- If this may be a crime scene, nothing in and around the immediate area should be disturbed.
- Patients who are in a hypothermic environment may respond to resuscitation measures for a longer period of time. Therefore, hypothermic patients should be resuscitated until normal body temperature is achieved.
- **When in doubt, resuscitate and transport.**
- The criteria noted herein **DO NOT** apply in the situation of a **mass casualty incident** [MCI].

TERMINATION OF CARDIOPULMONARY RESUSCITATION

The Paramedic has the discretion to continue resuscitation efforts in any case despite Termination of Resuscitation criteria being met if scene safety, location, patient's age, time of arrest, or bystander input compels this decision.

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

Medical Control Contact Not Required/Asystole

The Paramedic may terminate resuscitative efforts in non-hypothermic adults provided all 5 of the following criteria exist after 20 minutes of CPR:

- Initial rhythm is Asystole confirmed in two leads on a printed rhythm strip
- Rhythm remains in Asystole throughout resuscitative efforts
- Secure airway confirmed by digital capnography (ETT or King LTA)
- Medication efforts have been exhausted per protocol 24.3.5

Quantitative ETCO2 value is <10 mmHG with effective CPR

Do not terminate resuscitation efforts if transport has been initiated.

In the case of extenuating circumstances, contact Medical Control for direction.

MEDICAL CARE PROTOCOL
SUSPECTED CHILD/ELDER ABUSE
CHAPTER 24.1.5

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Whenever child or elder abuse is suspected, assess the scene closely.

Record all appropriate information on the patient care report.

Upon arrival at the Emergency Department, a verbal report summarizing your findings should be given to the responsible medical personnel. Complete any appropriate paperwork in compliance with organizational and administrative procedures.

Do not delay transport to obtain the above information.

Do not make accusatory, confrontation, angry, or threatening statements to any parties present.

Any non-transported patient, for whom you have concerns about the possible abuse, will be reported to the appropriate local or state agency (Children and Family Services, LEA). The District Chief/Supervisor will also be notified.

ABUSE REGISTRY 1-800-962-2873

MEDICAL CARE PROTOCOL
DETERMINATION OF HOSPITAL DESTINATION
CHAPTER 24.1.6

Issued: May 2010

Revised: July 11, Aug 13, Dec 13 Submitted By: Technical Services Approved By: Medical Director

Determine the acuity of the patient's chief complaint, illness, or injury.

Emphasis on delivering patients to the correct destination for definitive treatment on the first transport.

Any High Acuity and/or critical patient shall be transported to the closest, appropriate hospital-based emergency department.

Free Standing Emergency Department (FSED) Policy

If Low Acuity Type presentation:

- FSED's may be considered as a transport destination for patients *ONLY* upon their request, and **if they are not excluded by the parameters of this protocol.**
- The Rescue Lt. will document in the narrative of the report that the patient was provided a clear explanation of their requested destination, its inability to provide cardiac catheterization, surgical care, dialysis, etc, and need for double transport for admission.

Patients exhibiting or complaining of any of the following will be EXCLUDED, and not considered eligible for transport to a Free Standing Emergency Department:

- Alerts (Trauma, Stroke, Stemi, Sepsis, etc…)
- Chest Pain
- Shortness of Breath/Hypoxia
- Abdominal Pain
- Abnormal Vital Signs
- Altered mental status or Glascow score <15
- Concern for Open/Angulated Long bone fracture

- Concern for pulseless/ischemic extremity

- Any violent patient
- Any patient *potentially requiring admission* in the paramedics' best judgment.(ex. Elderly, weakness, dizziness, dialysis, etc)

Shands UF Obstetric Patients

- OB patients, who are 16 weeks of gestation or greater and experiencing acute labor related emergencies, including pre-hospital deliveries, should be transported to the Pediatric Emergency Department in the Shands Hospital for Children located in the Shands UF North Tower. Patients SHALL be taken by hospital personnel to the Labor and Delivery Unit in the North Tower.
- OB patients with non-labor related emergencies should be transported to the current Emergency Department in the South Tower
- When transporting an OB patient, notify the ED as early in the call as possible. When the ED gets the radio call from ACFR stating they have an L&D transport, the ED will notify Labor and Delivery. Patient report will be provided and patient care transferred to the hospital representative. Patients SHALL be taken by hospital personnel to the Labor and Delivery Unit in the North Tower.
- If the OB patient is unstable, the ED physician will evaluate and stabilize the patient in the ED.
- If the transport is an inter-facility transfer and the OB physician requests EMS to transport the patient to OB triage, the L&D RN will meet EMS personnel at the designated elevator and both personnel will transport the patient to meet the OB physician in OB triage.
- All Rescues carrying pediatric patients inbound to Shands at UF (less than 18 years old in need of emergency services), shall be routed to the Pediatric Emergency Department in the Shands Hospital for Children located on the north side of Archer Road (North Tower-old ER) except for those meeting trauma alert criteria.
- All patients meeting trauma alert criteria, regardless of age, should be transported to the Shands at UF Trauma Center, located on the south side of Archer Road.

- Transport the patient to the emergency department of the patient's choice unless excluded by the above parameters of destination.

If the patient is unable to make such a judgment (minors, etc.), transport the patient to the emergency department of choice of an appropriate party acting on behalf of the patient (parent, guardian).

If the patient expresses no choice and if no other appropriate party is available or has reason to act on behalf of the patient, transport the patient to the closest appropriate emergency department.

No paramedic is to influence the choice of hospital by the patient nor assume that any hospital cannot offer its usual range of services thereby preferentially re-routing patients to select facilities, however, paramedic personnel may educate those requesting information to the appropriate facility for their specific type and acuteness of emergency consistent with recognized local practice.

MEDICAL CARE PROTOCOL
HOSPITAL EMERGENCY DEPT. EMS BYPASS GUIDELINES
CHAPTER 24.1.7

Issued: May 2010

Revised: Submitted By: Technical Services Approved By:Medical Director

Recognizing that the usual capabilities of a particular department my become acutely and temporally overwhelmed, it may be necessary to temporarily divert patients to other facilities. To promote community cooperation in the delivery of emergency services, we have agreed to the following standards:

The only complete hospital bypass is as a result of a hospital disaster (fire, power failure, HAZMAT incident, flooded ED, etc.) or a security lockdown (armed and dangerous subject in the ED). All patients are subject to hospital bypass.

EMS bypass, as determined only by persons authorized to do so (Hospital designee in cooperation with the ACFR Medical Director), will give the emergency department of that hospital temporary relief from incoming patients via EMS. This status is independent of any temporary change in other hospital capabilities.

Once notified of a hospital's bypass status, EMS crews **will** make every effort to honor that status. Exceptions to this rule include:

- **The patient whose condition is unstable, life threatened, and deteriorating will be taken to the closest appropriate facility, regardless of bypass status. The paramedic attending the patient is the sole arbiter of the patient's status.**
- If the patient (or third party responsible for the patient) insists on patient transport to a facility on bypass for the patient's condition, on-line medical control at the facility requested by the patient (or surrogate) will be contacted for assistance. The directives of the on-line medical control physician will indicate the most appropriate destination for the patient.
- Any hospital placing themselves on EMS bypass status will notify the Combined Communications Center when the ED has been reopened.

Each hospital will develop internal procedures for determining which personnel are authorized to recommend bypass and are authorized to report hospital status to the Alachua County Combined Communications Center (CCC).

Should two or more receiving facilities request bypass status at the same time, all bypasses will be terminated. The administrator's on-call at each facility will be notified (by their respective ED staffs) in this event and the Combined Communications Center will issue an administrative page to ACFR and the Medical Director. In this event, the hospitals involved, ACFR and the Medical Director will determine status and notify the Combined Communications Center.

These guidelines apply to patients transported by Alachua County Fire/Rescue units only. Extension of these guidelines to patients transported by EMS units of other agencies may be permitted.

MEDICAL CARE PROTOCOL
REFUSAL OF SERVICE
CHAPTER 24.1.8

Issued: May 2010

Revised: February 2012 Submitted By: EMS Division Approved By: Medical Director

A written run report is required for any encounter involving an individual expressing a chief complaint and/or an individual presenting with assessment findings outside of normal established values. The written report must include thorough documentation describing the type of situation found, assessment findings, the suspected chief complaint, treatment or care rendered, reactions noted, and disposition of the patient including any instruction given in a case when care is refused.

Dealing with patients who activate the EMS system (or has the system activated on their behalf by a third party) and then declines or refuses care and/or transport is a difficult problem for the field paramedic. Using an ordered approach in these situations will help expedite a satisfactory resolution. **The assumption should ALWAYS be that the patient requires medical care and transport.**

Assess the patient and the scene.

- Obtain a history from the patient and/or others in the area, including mechanism of injury (if appropriate).
- Obtain the patient's vital signs and document on the run report
- Perform the physical examination, paying particular attention to alterations in mental status or vital signs and consider any traumatic injury, mechanism of injury, or medical illness that may represent a threat to the well being of the patient.
- Document clearly if the patient or surrogate refuses assessment.

Assess the <u>competency</u> of the patient.

For our purposes, a competent patient shall be defined as one who is:

- Over 18 years of age, or is an emancipated minor (a pregnant woman, a woman who has given birth, or a married person of either gender) and;
- Awake, alert, and fully oriented to time, person, place, and situation and;
- Has no alterations in vital signs, mental status, or level of consciousness and;
- Has no signs of acute injury or illness, and has no signs of chronic illness, either of which may influence the ability to make an informed decision and;
  - Is not exhibiting clinical signs of intoxication by alcohol or drugs, (licit or illicit) **<u>and/ or</u>**
  - Has no history of mental illness that affects their decision-making ability.

If the patient (or parent or guardian) <u>is judged competent</u> to refuse transport:

- Again emphasize the need for care, the risks of refusal of care (including death), and our wish to transport the patient;

- If patient, parent, or guardian declines care, and the EMS personnel do not feel transport by EMS to the hospital is required, patient, parent, or guardian must sign the appropriate written release form in front of two witnesses. The patient, parent, or guardian who is judged competent, declines care, and then refuses to sign the waiver will prompt the EMS crew to reassess the competency of the individual; if still considered competent to decline care, a verbal statement MUST be documented on the run report and the verbal waiver form completed.

If the patient (or parent or guardian) <u>is judged not competent</u> to refuse transport:

- Explain to the patient (or parent/guardian) the need for transport; reassure the patient that no harm will result from transport but that complications, up to and including death, may result from a delay in treatment;

- If patient, parent, or guardian continues to refuse care, enlist the MCP or law enforcement personnel to secure patient for transport.

Refusal of treatment/ transport of <u>minors</u>:

- Although care may be refused by a responsible parent or legal guardian if said parent or guardian making the decision qualifies as competent as defined above, every effort will be made to transport minors exhibiting any findings consistent with injury, alteration in mental status, or intoxication. If the parents or guardian are not on scene, they may make the refusal over the telephone. Two witnesses will confirm the telephone conversation by signing the waiver form.

- Where there are historical or physical findings of injury or illness, intoxication, and/or alterations in mental status, level of consciousness, or vital signs, and no parent or guardian is available, the minor will be transported.

- If the minor is a college student, the paramedic will obtain assistance from the MCP prior to obtaining a waiver.

- If the EMS system is summoned to by a third party and either the patient is not found or there is no EMS assistance required, there is “No Patient” and no refusal form is required.
  - If patient contact is made a patient care report must be completed.

  - If patient, parent, or guardian refuses care, and EMS personnel feel transport to the hospital is required, the patient, parent, or guardian must sign the appropriate written release form in front of two witnesses.

  - The patient, parent, or guardian who is judged competent, refuses care, and then refuses to sign the waiver will prompt the EMS crew to reassess the competency if the individual;

  - If the person in question is still considered competent to decline care, a verbal statement **MUST** be documented on the run report and the verbal waiver form completed. It is recommended to contact the medical control physician to help persuade these patients to agree to care and transport.

  - Thank patient, parent, or guardian for signing the release. Emphasize that our EMS system **WILL RETURN** should the patient, parent, or guardian change his or her mind.

All episodes, which involve refusal of care or assessment of competency, must be documented completely on the run report.

- If responding to a call at "The Birthing Center," please transport all of these patients unless the paramedic is advised by the midwife on scene that she has decided there is no need for transport. In these cases, "The Birthing Center" has taken full responsibility of this patient after our departure. This decision will not be based on our "assessment." Please document appropriately why you were called and ask the midwife to sign a refusal waiver.

Refusal of Transport After Treatment Given

Bronchospasm Resolved After Nebulizer Treatment

- After treatment of bronchospasm, and return to an asymptomatic state, some patients will refuse transport to the hospital.

- The following items should be accounted for and included in the assessment and documentation:
  - The presentation is consistent with a mild exacerbation of asthma
  - No severe dyspnea at onset
  - No pain, sputum, fever or hemoptysis
  - Not initially hypoxic (oxygen saturation < 90%)
  - Significant improvement after a single nebulizer treatment
  - Complete resolution of symptoms
  - Vital signs within normal limits after treatment given
  - (BP, pulse, respiratory rate, oxygenation)
  - Additional patient safety measures that should be considered:
    - A family member or caregiver should be available to stay with the patient and assist if a relapse occurs
  - Assure the patient understands transport has been offered and subsequently refused

Informed the patient to follow-up with their physician as soon as possible and/or to re-contact 911 if symptoms re-occur

Insulin Induced Hypoglycemia-Resolved

- This protocol applies only to insulin dependent diabetic patients who are refusing hospital transport after the resolution of insulin-induced hypoglycemia by the administration of intravenous D50. After treatment of hypoglycemia, and return to an asymptomatic state, some patients will refuse transport to the hospital.

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

- The patient is on Insulin only (does not take oral diabetic medications)

- The presentation is consistent with hypoglycemia
- Rapid improvement, and complete resolution of symptoms, after D50
- Vital signs within normal limits after glucose given
  - (BP, pulse, respiratory rate, oxygenation, and blood sugar > 70)
  - There is no indication of an intentional overdose or dosing error

Additional patient safety measures that should be considered:

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

NO REFUSAL OF CARE WILL OCCUR IN THE PATIENT WHO, AFTER EVALUATION BY RESCUE PERSONNEL, IS JUDGED TO BE AT RISK OF OR SUFFERING FROM A SERIOUS ILLNESS OR INJURY, WITHOUT THE INVOLVEMENT OF THE ON-LINE MEDICAL CONTROL PHYSICIAN (OLMCP).

Situations deemed high risk include:

- Patients <1, >65
- Trauma Patients
- Intoxicated Patients
- Chest Pain
- Abnormal Vital Signs
- Mental Health Concerns
- Status Post Treatment(seizure, asthma, hypoglycemia)

Termination of Efforts to Obtain Consent –

There are six situations where efforts to obtain consent from the patient may be discontinued:
1) Patient decides to consent

2) Patient's level of consciousness deteriorates to the point that they are no longer able to refuse care -- care may now proceed under implied consent.

3) Patient continues to refuse and the patient is determined to be capable of making an informed refusal and OLMCP consultation was not required

4) Patient continues to refuse, physical restraint with law enforcement assistance is needed, law enforcement refuses to assist (tape document), and OLMCP approves discontinuation of efforts.

5) Patient has left the scene and efforts to detain the patient would be inappropriate or dangerous.

6) Contact with medical direction has occurred.

Many times, patients will decide to consent after they hear the consultation with OLMCP, in spite of the sincere efforts of field crews. Therefore, take advantage of that fact to help persuade a patient to seek care as appropriate. You may ask OLMCP to speak directly with the patient. This has also been helpful in getting the patient to consent. If they still refuse, it puts the patient's own voice on the tape log of the radio system as an

additional documentation of the system's sincere efforts to have the patient make an informed decision.

MEDICAL CARE PROTOCOL
PHYSICIAN ON SCENE
CHAPTER 24.1.9

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

If a physician on scene offers to provide assistance/physician-command for a case requiring Advanced Life Support, the paramedic is to do the following, as long as it may be accomplished without putting the patient at risk for further morbidity or mortality. A “physician” is, for the purposes of this protocol, defined as a health care practitioner with either an MD or DO Degree.

Determination of Qualification:
- A valid license to practice medicine is required.

Authorization to Paramedics:
- Paramedics are authorized to proceed under the command of a physician on scene only if the physician has produced a valid license to practice medicine. Any dispute will be referred to the Medical Control Physician [MCP].

Requirements of Physician on Scene:
- **Assistance:** After determination of qualification, the physician who wishes to assist the Paramedic, but not take physical command, may do so. In this situation, the Paramedic remains in command and the Physician acts as either an extra set of hands or as a resource for selected procedures (i.e., Endotracheal Intubation) or both.
- **Command:** Physical command may be accepted ONLY if the physician on scene agrees to sign the narrative section at the bottom right corner of the run report **AND** agrees to accompany the patient to the hospital.
- **Any conflicts will be referred to the MCP for resolution.**
- The physician who offers assistance at a scene call is doing so for reasons of humanity. A professional and respectful attitude toward the physician-volunteer will be maintained.

MEDICAL CARE PROTOCOL
UNIVERSAL PRECAUTIONS
CHAPTER 24.1.10

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

All blood and bodily fluids will be considered infectious.

Appropriate Personal Protective Equipment (PPE) will be worn when treating patients where blood and/or OPIM (Other Potentially Infectious Materials) are evident or suspected.

Appropriate respiratory protection will be used if it is documented or suspected that the patient may have infectious Tuberculosis or any other respiratory spread infection.

General Practices:

- Sharps will be disposed of in appropriate sharps container(s).
- Sharps will not be recapped.
- Hands will be cleaned, preferably with soap and water after patient contact or contact with OPIM; however, waterless hand cleaners may be used until soap and water are available.
- Contaminated equipment will be cleaned and then disinfected.
- PPE should be used to cover any areas on an employee's person that could provide a route for contamination.

Universal Precautions Categories:

Mechanical Devices:
- Sharps containers and biomedical waste red bags.
- Sharps Safety Devices.

Personal Protective Equipment (PPE)
Gloves, Gowns, Eyewear, Fluid Shields, N95 Respirators.

Housekeeping:
- Cleaning and disinfecting products.
- Waterless hand cleaner.

MEDICAL CARE PROTOCOL
QUALITY ASSURANCE PROGRAM
CHAPTER 24.1.11

Issued: May 2010

Revised: Feb 14 Submitted By: Technical Services Approved By: Medical Director

Purpose: To establish the review of field incident reports and on scene care to identify and continually measure the quality of emergency medical care being provided to the citizens of Alachua County. It is the intent of these guidelines to meet, and or exceed the requirements of Florida Statute 401 and 64E (section 8) as well as the current Protocols developed by the Medical Director.

Scope: The guidelines prescribed are applicable to all employees of the Fire Rescue department and may not be deviated from without the expressed, written permission of the current Medical Director.

General: Information received through the review of medical field incident reports and on-scene observation of care provided will be used in focused studies and education, benchmarking, and performance outcomes which will improve the overall quality of service provided by the Alachua County Fire Rescue..

Quality Assurance Categories to Be Reviewed Each Shift:
- Cardiac Alert/Cardiac Arrest
- Stroke Alert
- Chest Pain (30%)
- Unconscious Patient GCS <8
- Pregnancy/OB
- Patient Refusal of Care (30%)
- Alternating Protocol as assigned by Technical Services

Quality Assurance Categories to Be Reviewed Monthly:
- Trauma Alert/Trauma Arrest
- Drowning
- Death Scene
- Airway Techniques including CPAP
- Administration of Medications (All uses of Morphine and Versed)

Components of the EMS Quality Management Program:
- Review of the Standard of Care as set forth in Florida Statute and the current Protocols developed by the Medical Director in the following areas:
- EMS Report Documentation
- Performance Standards and Skill Evaluation
- Patient Outcome

The above areas will be reviewed for:
- Call time date/Completion time date
- Quality of Care Delivered
- Process Improvement Needs
- System-wide Remediation Requirements
- Individual Remediation Requirements

The following areas of the EMS Run Report document shall be reviewed as basic criteria for all reports:
- Patient Identification on ALL pages
- Biographical and Personal Data

- Paramedic/EMT Identification
- Entry Date
- Identification of Chief Complaint
- Patient History/Pertinent
- Physical Examination Results
- Diagnosis
- Documentation of ALL treatment
- Medically Appropriate Care
- Narrative which documents all pertinent patient care along with any unusual occurrences.

Data Collection:
Electronic Reports are completed in the County Reporting Management System (RMS). Upon completion of the incident, the Paramedic/EMT is responsible for the completion of the electronic report. All screens requiring data should be completed as soon as possible so that the most accurate information is collected on each patient.

Each electronic report is reviewed by the Rescue Lieutenant assigned to QA for adherence to protocols and completion of required data. Any discrepancies will be forwarded to Technical Services for review. After review by Technical Services, any discrepancies will be returned to the individual paramedic for correction.

All report data is used to develop future training needs for the Department.

Patient Care Review Process
In order to provide consistent and constant review of our procedures, the following steps shall be followed for each patient who receives care according to the QA review categories:

- EMS report is generated by field personnel for any EMS response by Fire and/or Rescue Unit where patient contact is made.
- After the report is completed, it is reviewed by the Rescue Lieutenant assigned to QA for compliance to practice parameters. The goal is to review qualifying EMS reports, based upon the QA categories, by the completion of the next duty shift. (72 hours)
- The Rescue Lieutenants assigned to QA will be the Rescue Lieutenants assigned to Rescue 8 and Rescue 25. They will split the categories and review the reports of the shift prior to their assigned shift. The categories will be split as follows:

Rescue 8
- Patient refusal of Care (30%)
- Administration of Medications (All uses of Morphine and Versed)
- Airway Techniques (CPAP, Cric, King Tube, NTI, OTI, ETCO2/Capnography)
- Basic Medical Care (10 calls per shift)
- Stroke Alert
- Chest Pain (30%)
- Trauma Alert
- Alternating Protocol as assigned by EMS Branch

Rescue 25

- Pregnancy/OB
- Cardiac Arrest
- Death at Scene
- Sepsis Alert
- Stemi Alert
- Basic Medical Care (10 calls per shift)

Training

- Unconscious Patient GCS <8
- Drowning

Technical Services will determine when rotation of categories is necessary.

All reports reflecting a high degree of quality in patient care or which may have questions regarding compliance with current protocols will be flagged for further review by the Technical Services Branch.

The Rescue Lieutenant assigned to QA will advise Technical Services via email of the recognition of excellent care, as well as any non-compliance issue.

The Technical Services Branch will track all trends in service to determine future needs for training and or changes in the protocols.

Technical Services will notify the assigned District Chief of trends, need for remedial training, and any issue being removed from the QA process for discipline.

The Technical Services Branch shall prepare a report of data on a quarterly basis. This report shall include all significant responses along with any possible changes in trends.

See EMS Quality Assurance Matrix Attachment

EMS Review Guidelines:
The following guidelines shall be used for the review of EMS reports.

***Trauma Alert/Cardiac Arrest/Drowning* Treatment Parameters:**

- On Scene Time < 10 minutes or documentation of reason for prolonged scene time
- Protocol Adherence
- Advanced Skills Utilized
- Accurate ECG Interpretation

Patient Outcome:

- Restoration of Vital Signs
- Maintenance of Vital Signs
- Improvement in Vital Signs

Patient Transportation:

- Ground transportation used to appropriate facility

- Air-Medical Transportation (requested)

Medical Cardiac Arrest/Cardiac Alert/Stroke Alert/Unconscious Patient

Treatment Parameters:
- On Scene Time < 20 minutes or documentation of reason for prolonged scene time
- Protocol Adherence
- Advanced Skills Utilized
- Accurate ECG Interpretation

Patient Outcome:
- Restoration of Vital Signs
- Maintenance of Vital Signs
- Improvement in Vital Signs

Patient Transportation:
- Ground transportation used to appropriate facility

Pregnancy/OB

Treatment Parameters:
- On Scene Time < 10 minutes or documentation of reason for prolonged scene time
- Protocol Adherence
- Advanced Skills Utilized
- Accurate ECG Interpretation

Patient Outcome:
- Restoration of Vital Signs
- Maintenance of Vital Signs
- Improvement in Vital Signs

Patient Transportation:
- Ground transportation used to appropriate facility

Pediatric ALS/Cardiac Arrest

Treatment Parameters:
- On Scene Time < 20 minutes or documentation of reason for prolonged scene time
- Protocol Adherence
- Advanced Skills Utilized
- Accurate ECG Interpretation

Patient Outcome:
- Restoration of Vital Signs
- Maintenance of Vital Signs
- Improvement in Vital Signs

Patient Transportation:
- Ground transportation used to appropriate facility

Pediatric Trauma

Treatment Parameters:
- On Scene Time < 10 minutes or documentation of reason for prolonged scene time

- Protocol Adherence
- Advanced Skills Utilized
- Accurate ECG Interpretation

Patient Outcome:
- Restoration of Vital Signs
- Maintenance of Vital Signs
- Improvement in Vital Signs

Patient Transportation:
- Ground transportation used to appropriate facility
- Air-Medical Transportation (requested)

Death Scenes

Treatment Parameters:
- Determination of Death Parameter adherence
- Documentation of Parameter met
- Documentation of Contact with the Medical Director (IF REQUIRED)
- Documentation of Acceptable DNR form or Order (if applicable)
- Documentation of applicable scene assessment
- Documentation of notification of appropriate agencies / law enforcement
- Accurate ECG interpretation

Patient Refusal

Treatment Parameters:
- Protocol Adherence
- Patient's Chief Complaint
- Assessment which includes at least one (1) set of Vital Signs
- Working diagnosis, if able to obtain
- Statement of level of consciousness
- Attempts to convince patient to seek treatment if applicable
- Reason given for refusal documented
- Medical Direction if required

Invasive Airway Techniques

Oral, Nasal or Digital Intubation
- Treatment parameters per Standards of Care
- Documentation
- Performed per Standards of Care
- Bilateral breath sounds present
- Oxygen Supplementation
- Changes in Patient after Assessment

Cricothyrotomy
- Performed within Standards of Care
- Documentation
- Performed per Standards of Care
- Amount of bleeding
- Bilateral Breath sounds present
- Oxygen Supplementation

Patient Disposition

- Patent airway on first attempt
- Patent airway on second attempt
- Patent airway on greater than two (2) attempts
- Patient without successful airway patency

Medication Administration

Treatment Parameters
- Per Standard of Care
- Appropriate medication for working diagnosis

Documentation
- Medication delivered
- Dosage and amount
- Delivery route
- Response of patient to medication
- Any reactions or complications

Patient Disposition
- Expected, positive response to medication
- Untoward reaction

Alternating Protocol

A rotation of all protocol that is not already listed in this SOG will be on a monthly rotation. The rotation will be scheduled by Technical Services. Technical Services will email the QA Rescue Lieutenants by the 1st of the month specifying the protocol to be reviewed.

Probationary Rescue Lieutenants and Newly Cleared Paramedics

All EMS reports for Probationary Rescue Lieutenants and newly cleared Paramedics will be reviewed for completeness and adherence to MCP during their first three months. The need for further review will be determined by Technical Services and the assigned District Chief at the end of the three month period.

Treatment Exceptional
- A call that exceeds expectations

Acceptable
- Typical call with no deviation from protocol

Minor
- Deviation from MCP without MC Contract justification or without patient compromise
- Transfer of patient not documented
- No documentation of ETOH, Drugs, or Competency on Refusals

Major
- Missing “alert” notifications per MCP
- Improper rhythm recognition with concurrent treatment or non-treatment
- Incorrect medications or dosage
- Treatment without justification
- Lack of documented treatment that hindered patient care
- Waiver without MC contact or justification
- Failure to obtain waiver without justification

Written

Class 1

- Missing signature
- Grammar and spelling errors
- Times missing from treatment section

Class 2
- Missing EKG
- Incorrect Protocol used

Class 3
- Poorly written narrative

Class 4
- Incomplete Report

Good
- Report is complete and has all required information

Outstanding
- All required information
    - Narrative is very clear as to this situation
    - All required signatures

Training Captains will be responsible for reviewing EMS Reports for new Rescue Lieutenants during their first three months after completing the orientation process. Those Rescue Lieutenants responsible for the QA Process at Rescue 8 and 25 will be notified when new Rescue Lieutenants have completed those three months.

Rescue Lieutenants assigned to Q/A will send an e-mail to their District Chief on a weekly basis; reporting the number of medical reports reviewed during that time period. Deficiencies shall be reviewed by the District Chief to ensure compliance to the policy.

click to view ? Quality Assurance Matrix

EMS Quality Assurance Matrix:

The following matrix shall be used to provide continued quality improvement to the Department's EMS system.

MEDICAL CARE PROTOCOLS
BAKER/MARCHMAN ACT

CHAPTER 24.1.12
Issued: June 2010 Revised: Nov 12

Submitted by: EMS Branch Approved by: Chief Ed Bailey

Purpose

To establish standard guidelines and procedures that will serve to provide a safe working environment for all employees and patients during the treatment and transportation of patients placed under the Baker /Marchman Acts.

Policy

These policies aim to create an understanding of the unique challenges posed by patients confined under these Acts and seek to create a guideline for treatment and transportation of these patients with an emphasis on crew, patient, and citizen safety.

Definitions

Baker Act Florida Statues Chapter 394 Mental Health.

In 1971, the Florida Legislature enacted the Florida Mental Health Act, a comprehensive revision of the state's mental health commitment laws. The law is widely referred to as the "Baker Act" in honor of Maxine Baker, the former state representative who sponsored the Act. Since the Baker Act became effective in 1972, multiple legislative amendments have been enacted to protect individuals' civil and due process rights.

The **Florida Mental Health Act of 1971** (commonly known as the **"Baker Act"**) allows involuntary examination of an individual who presents with:

A. A mental illness (as defined in the Baker Act) and
B. Who is a harm to self, harm to others, or is at risk for self-neglect (as defined in the Baker Act).

This examination must be performed within 72 hours.
Can only be initiated by:

- Judges,
- Law Enforcement Officers,
- Physicians or
- Mental Health professionals

The **Marchman Ac**t is a part of the Florida statutes that allows for voluntary or involuntary assessment of anyone who is suspected of being under the influence of drugs or alcohol and because of this has lost the power of self-control with respect to substance use and is a danger to themselves or others. This act is filed with the court system.

Procedures

The Florida Mental Health Act, section FSS-394.462(1.) (Transportation) sets out the provision of transportation service of involuntary Baker Act Patients. The "County has designated" the Alachua County Sheriff's Office (ACSO) as one of the transportation providers for Baker Act patients within Alachua County. The Sheriff's Office is responsible for transporting to the nearest receiving facility. Thus, this Standard Operating Guideline seeks to provide examples and courses of actions that should be taken for the transportation of these patients to a receiving facility. This same section also states that once at a receiving facility it is unlawful for law enforcement to transport to a medical facility, "County or municipal law enforcement and correctional personnel and equipment shall not be used to transport patients adjudicated incapacitated or found by the court to meet the criteria for involuntary

placement pursuant to s. 394.467 ". This does not eliminate the need for common sense and a practical approach to handling these individuals.

The ACSO or Law Enforcement Agency (LEA) will transport all Baker Act and Marchman Act patients to the nearest receiving facility unless an exception listed below is present:

1. The patient is undergoing a medical emergency which requires the treatment abilities of an EMS unit.
2. The patient has a physical limitation which precludes the transportation by a law enforcement vehicle such as being confined to a stretcher or unable to sit.

In cases where a patient is under the provision of the involuntary Baker Act/Marchman Act and requires transportation or tranfer to a medical facility by EMS.

1. The cases where the transferring facility is willing to provide a patient advocate, the advocate will be responsible for the enforcement of the Baker /Marchman Act during transport.
2. In cases where the transferring facility does not provide custodial care, should the patient present the crew with an imminent threat or an appearance of violent behavior, the Alachua County Sheriff's Office will be contacted for assistance with securing the patient and protecting the crew. The sheriff's Office cannot be used as a regular component of transfers.

    A. In the spirit of inter-agency cooperation, should the patient not present the crew with an imminent threat or an appearance of violent behavior, the patient will be transported as any other patient would.

    B. The EMS crew is not to enforce the restraint order and should the patient seek to exit the vehicle it will be up to law enforcement to secure the patient. A new evaluation of the patient will have to be conducted by law enforcement to see if the patient still meets the criteria for a Baker Act involuntary examination. If the patient does meet the criteria then they will be taken to the nearest receiving facility with medical care.

    C. Should the deputy restrain a patient that is being transported by EMS through the use of handcuffs or other methods, the deputy may need to ride in the EMS unit to provide access to the patient in the event that the patient becomes unstable. EMS providers will not transport patients who have been placed in the "hogtie or hobble position." This can cause asphyxia and will not be tolerated.

    D. Should the Rescue Lieutenant feel threatened or uncomfortable from the patient's imminent violent behavior, they may request a deputy to ride along with the unit to provide security for the crew. The assisting ACSO Deputy (LEA) on scene will evaluate the patient's demeanor, and contact their Shift Commander. A determination will be made if it's necessary for an (LEA) to ride inside or follow the EMS vehicle with the patient to the receiving facility. If the patient should become violent, the EMS vehicle will pull over and the Deputy will contact the ACSO Shift Commander for approval to ride in the EMS vehicle for the remainder of the transport In those instances when other law enforcement agencies are involved, their appropriate Shift Commander should be contacted regarding this request. Should the deputy refuse, the

crew should contact their on-duty District Chief for direction.

E. In the rare event of an immediate life threatening condition, where waiting for an appropriate law enforcement officer would cause the injury/death of the patient, the EMS crew will notify their District Chief and request personnel from additional units until there is sufficient manpower to mitigate any possible threat posed by the patient, should they become combative.

In cases where inter-facility transfers are requested for a patient to a facility outside Alachua County.

1. The transferring facility shall provide a bonded law enforcement officer to maintain the Baker/Marchman Act provision.
   F. In the case where the facility refuses to provide this agent, the EMS crew will contact the on-duty District Chief. If the facility is unable and or unwilling to provide the security agent at the request of the DC, the DC will refuse the transfer.
   G. In the spirit of professional cooperation, ACFR will provide return transportation for the security agent as long as the time constrains are deemed reasonable.

The following state statute pertains to those patients not qualifying for Baker or Marchman Act but are not competent to make rational decision.

401.445 Emergency examination and treatment of incapacitated persons.—

1. No recovery shall be allowed in any court in this state against any emergency medical technician, paramedic, or physician as defined in this chapter, any advanced registered nurse practitioner certified under s. 464.012< or any physician assistant licensed under s. 459.022<, or any person acting under the direct medical supervision of a physician, in an action brought for examining or treating a patient without his or her informed consent if:
   a. The patient at the time of examination or treatment is intoxicated, under the influence of drugs, or otherwise incapable of providing informed consent as provided in s. 766.103<
   b. The patient at the time of examination or treatment is experiencing an emergency medical condition; and
   c. The patient would reasonably, under all the surrounding circumstances, undergo such examination, treatment, or procedure if he or she were advised by the emergency medical technician, paramedic, physician, advanced registered nurse practitioner, or physician assistant in accordance with s. 766.103.

Examination and treatment provided under this subsection shall be limited to reasonable examination of the patient to determine the medical condition of the patient and treatment reasonably necessary to alleviate the emergency medical condition or to stabilize the patient.

2. In examining and treating a person who is apparently intoxicated, under the influence of drugs, or otherwise incapable of providing informed consent, the emergency medical technician, paramedic, physician, advanced registered nurse practitioner, or physician assistant, or any person acting under the direct medical supervision of a physician, shall proceed wherever possible with the consent of the person. If the person reasonably appears to be incapacitated and refuses his or her consent, the person may be examined, treated, or taken to a hospital or other appropriate treatment resource if he or she is in need of emergency attention, without his or her consent, but unreasonable force shall not be used.

3. This section does not limit medical treatment provided pursuant to court order or treatment provided in accordance with chapter 394 or chapter 397..

MEDICAL CARE PROTOCOL
Rapid Extrication

CHAPTER 24.1.14

Issued: January 15, 2013 Revised:
Submitted By: Technical Services
Approved by: Medical Director

Purpose:

To establish a written guideline documenting conditions where physical or environmental conditions exist which preclude the initiation of most, if not all other medical care guidelines for the wellbeing of all personnel involved. The scope of the guideline is not to list every possible condition where rapid extrication would be required, but rather to set the parameters which could elicit the use of rapid extrication.

The field of emergency services by its very nature is unpredictable and often times places the lives of patients, caregivers and bystanders in harm's way. Occasionally, there are incidents where the situation and or conditions are so volatile that it places the wellbeing of the personnel involved at greater risk if basic medical care is provided. These occasions are rare but require definitive action to ensure the safety of all involved.

Examples of Situations and Conditions which may require the use of rapid extrication techniques to lower the risk to all involved.

- Environmental Conditions

Fires, floods, civil unrest, animal/insect and weather all can sometimes present a condition where patients must be moved to a safe location prior to the initiation of basic medical care.

- Physical Situations

Patient position, location and situation have to be measured when decisions regarding the initiation of medical care are considered. Patients in positions where care is not practical or possible must be moved with all expediency to a location where proper medical care can be provided. Examples of such situations may include high angles, confined space rescues, entrapment within burning/sinking vehicles, locations such as the stands during a university of Florida home game where access to the patient is limited. Under these situations dangers to patient, caregivers and bystander may be lessened by moving the patient prior to the initiation of care.

Once the decision is made, that moving the patient to a safe location prior to the initiation of care poses a better treatment option or threat to the patient or caregiver than the dangers of their current location, several considerations are needed.

1. Risk vs. benefit must be weighed to determine if a rescue is possible.
2. If the determination is made that a recue is possible the move needs to be rapidly undertaken and completed as soon as possible to allow for the initiation of needed care.
3. Other injuries such as C-spine and occluded airways may exist and if at all possible these

considerations should be addressed.

BASIC MEDICAL CARE PROTOCOL

CHAPTER 24.2.1

Issued: May 2010

Revised:Ju 11, Jul 15 Submitted By: Technical Services Approved By: Medical Director

The phrase “Basic Medical Care” is used throughout the entire protocol as the first direction in patient care. This phrase will encompass all of the following and includes all of the BLS care protocols that are appropriate to the patient.

Scene size up:
- Utilize Personal Protective Equipment
- Assess the scene for hazards
- Park unit in a safe place
- Protect yourself and crew members
- Assess for the number of patients
- Assess the need for additional resources
- Assess the general condition of the patient(s)

Establish responsiveness:
If unresponsive;
- Basic Life Support
  - Establish patent airway, open airway if necessary protecting cervical spine when indicated
  - Supplemental oxygen if any respiratory signs or symptoms present
  - Record and monitor vital signs
  - Control bleeding when indicated
  - Record Blood Glucose Level if any weakness, altered mental status or history of diabetes
  - Nothing by mouth, unless patient is a known diabetic with hypoglycemia and is able to self-administer oral Glucose Paste, or a glucose containing beverage
- Advanced Life Support
  - When condition warrants (specified as “Full ALS Assessment and Treatment” in individual protocols):
  - Advanced airway/ventilatory management as needed
  - Perform cardiac monitoring
  - Evaluate 12-lead ECG if chest pain, abdominal pain above the umbilicus or ischemic equivalent symptoms (dizziness, weakness, shortness of breath)
  - Obtain vital signs
  - Obtain history and perform physical exam
  - Record & monitor continuous 02 saturation and microstream capnography
  - IV 0.9% NaCl KVO or IV lock
- If evidence of dehydration (tachycardia, dry mucous membranes, poor skin turgor) administer boluses of 0.9% NaCl at 250 ml (hold at 500 ml total if no hypotension)

- If BP < 90 mm Hg systolic, administer boluses of 0.9% NaCl at 250 ml until systolic BP > 90 mm Hg
  - Contraindicated if evidence of congestive heart failure (e.g. rales)

- If Hypoglycemic (Blood glucose < 60 mg/dL [<50mg/dL if stroke]) with IV access

- Administer Dextrose 10% solution in an adult starting dose is 100ml IV x 1. May be repeated in 10 minutes if blood glucose level remains <60 mg/dl.
- Pediatric dosing is Dextrose 10% solution 5ml/kg with a maximum single dose of 100 ml.
- Document amount of D10 administered in milliliters.
- If unable to establish vascular access, administer Glucagon, 1 mg IM or IN
- D10 may be repeated in 10 minutes if blood sugar remains <60

- If Hypoglycemic (Blood glucose < 60 mg/dL, [< 50 mg/dL if stroke]) without IV access
  - Glucose paste or other oral glucose containing agent (e.g. orange juice) if patient alert enough to self administer oral agent
  - If unable to take oral glucose administer Glucagon 1 mg IM
- Transport patient to nearest appropriate Emergency Department
- Minimize on scene time when possible
- Frequently reassess patient
- Contact Medical Control for any additional orders or questions

Click to view **?** **BLS for Healthcare Providers' Chart**

BLS For Health Care Providers

CPR	Adult and Older Child (puberty and older)	Child (1 year old to puberty)	Infant (Less than 1 year old)
Establish that the victim does not respond Activate your emergency response system.	Activate your emergency response system as soon as the victim is found.	Activate your emergency response system after giving 5 cycles of CPR.	
Open the airway Use head tilt–chin lift.	Head tilt–chin lift (Suspected trauma: jaw thrust)		
Check breathing If the victim is not breathing, give 2 breaths that make the chest rise.	Open the airway, look, listen, and feel. Take at least 5 seconds and no more than 10 seconds.		
First 2 breaths	Give 2 breaths (1 second each)		
Check pulse At least 5 seconds and no more than 10 seconds.	Carotid pulse (if no pulse, start CPR)	Carotid pulse (if no pulse or pulse is <60 bpm with signs of poor perfusion, start CPR)	Brachial pulse (if no pulse or pulse is <60 bpm with signs of poor perfusion, start CPR)
Start CPR			
• Compression location	Center of breastbone between nipples		Just below nipple line on breastbone
• Compression method	Heel of 1 hand, other hand on top (or 1 hand for small victims)		2 fingers (2 thumb–encircling hands for 2-rescuer CPR)
• Compression depth	1½ to 2 inches	⅓ to ½ depth of chest	
• Compression rate	100 per minute		
• Compression-ventilation ratio	30:2 (1- or 2-rescuer CPR)	30:2 for 1-rescuer CPR (15:2 for 2-rescuer CPR)	

BASIC MEDICAL CARE PROTOCOL
AIRWAY MANAGEMENT
CHAPTER 24.2.2

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Management of a patient's airway is paramount to life support.

The management of a patient's airway shall include the following in order from BLS to ALS:
- Position the head using the head tilt-chin lift method unless trauma is suspected
- The airway of a suspected trauma patient should be opened using the modified jaw thrust maneuver
- Use suction as needed to clear airway
- Use oral or nasal pharyngeal airway adjuncts
- Consider King LT tube
- Request ALS intervention

Assisted Ventilations:
- Adult patients with a respiratory rate less than 12 or greater than 28 breaths per minute and/or exhibiting signs of hypoxemia may require assisted ventilations. This shall include use of any of the following methods:
    - Utilizing Bag Valve Mask (BVM) and basic airway maneuvers, with supplemental **Oxygen**.
    - Deliver enough volume to make the chest rise.
    - Mouth-to-mouth, mouth-to-nose, mouth-to-stoma (at provider option when adjuncts are not available). If any of these methods are employed an incident report **MUST** be filled out because of the exposure.
- Pediatric patients with signs of hypoxemia and or respiratory distress (including bradycardia, abnormal breath sounds, increased work of breathing, nasal flaring, retractions, stridor or abnormal positioning) should have ventilations assisted with a mask that covers both mouth and nose, but not eyes. This can be accomplished utilizing:
    - Pediatric Bag Valve Mask (BVM) and reservoir with supplemental **Oxygen** at 10-25 LPM.
    - Mouth-to-mouth, mouth-to-nose, mouth-to-stoma (at provider option when adjuncts are not available.) If any of these methods are employed an incident report **MUST** be filled out because of the exposure.

Advanced Skills
Endotracheal Intubation (see protocol)
Cricothyrotomy (see protocol)

BASIC MEDICAL CARE PROTOCOL
OXYGEN THERAPY
CHAPTER 24.2.3

Issued: May 2010

Revised: July 12 Submitted By: EMS Branch Approved By: Medical Director

Oxygen should be administered to patients who:

- Display signs and symptoms of hypoxia
- Present in hypotensive states
- Have suffered major trauma
- Present as acutely ill
- Are suspected of carbon monoxide inhalation (regardless of **SaO2** reading)
- Are pregnant and may have reason for fetal hypoxia
- **Any patient who you suspect may become hypoxic due to mechanism of injury or nature of illness regardless of oxygen saturation level.**
- If patient is able to maintain SaO2 greater than 94% you may elect not to administer O2**.**

Methods of administration include:

- Nasal cannula 1-6 LPM = 24-40%
- Non re-breather mask 12-15 LPM = 90-95%
- Bag Valve Mask with reservoir 10-25 LPM = 90-100%
- Oxygen powered Ventilator N/A = 100%
- Ventilator 40-60 LPM = 21-100%

Oxygen therapy should never be withheld from any patient who displays a need for it.

BASIC MEDICAL CARE PROTOCOL
CONTROL OF EXTERNAL BLEEDING
CHAPTER 24.2.4

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Whenever the term **"Control external bleeding"** is used throughout these protocols, the following elements must be considered:

- Application of **direct pressure** with a sterile dressing
- **Elevation** of the injured part above the level of the heart
- Application of a **pressure dressing**
- Application of pressure to proper arterial **pressure point**
- Application of a **Tourniquet**
- Should be applied early when there is SEVERE arterial bleeding present.

Studies show considerable increase in survival rate when applied prior to the onset of shock.

BASIC MEDICAL CARE PROTOCOL
SHOCK
CHAPTER 24.2.5

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Decompensated Shock:

Any adult patient exhibiting signs of inadequate perfusion, which may include:

- Altered mental status (e.g. lethargy, coma)
- Tachycardia
- Pallor
- Diaphoresis
- Pale conjunctiva
- Delayed capillary refill
- Orthostatic vital sign changes
- Low Blood Pressure
- Thirst

Any pediatric patient having a systolic blood pressure BELOW normal [(**patient age x 2**) **+ 70**] or the following signs of inadequate central (proximal) perfusion:

- Altered mental status (e.g. lethargy, coma)
- Profound tachycardia or bradycardia
- Delayed capillary refill time (greater than 2 seconds)
- Any of the adult signs listed above

Protocol:

- Place patient in supine position
- **Oxygen** via NRBM @ 10-25 liters/minute
- Maintain body temperature
- Request ALS assistance

BASIC MEDICAL CARE PROTOCOL
MCI AND TRIAGE SYSTEM
CHAPTER 24.2.6

Issued: May 10

Revised: Dec 14 Submitted By: EMS Branch Approved By: Medical Director

Definition:

- A Mass Casualty incident or "MCI" is defined as any event that overwhelms the resources of the EMS system.
- MCI's will be classified into the following five levels per the Florida Field Operations Guide and recommended resources needed.

Level 1 (5-10 victims)

- 1-DC, 4-rescue units, 2-suppression units, 1-LEA supervisor.
- Administrative notification.
- Communications Center will notify UF Health and North Florida Regional requesting surge capability for each.

Level 2 (11 - 20 Victims)

- 2-DCs, 6-rescue units, 3-suppression units, LEA supervisor
- Communications Center will notify the 3 local hospitals and stand-alone ER's requesting surge capability for each.
- Medical director notification.
- Administrative notification.

Consider:

- Consider Mutual Aid.
- Fire and Rescue move-up.
- 1-RTS bus.
- Consider MCI trailers (ACFR & GFR)

- Medical Support Unit (MSU17) for transportation assistance

Level 3 (21-100 Victims)

- 3- DCs, 8 rescue units, 4-6 suppression units, LEA supervisor

- Communications Center will notify the 3 local hospitals, stand-alone ER's and the closest out of county hospital or trauma center requesting surge capability for each.

- EOC activated, Administrative notification, Medical director notification, Red Cross Notification.

Consider:

- Mutual Aid
- MSU 17, Helicopter strike team, ShandsCair Supervisor and Shandscair ground transports, 1-LEO Supervisor, 2- RTS busses. MCI trailers (ACFR & GFR).

Level 4 (101-1000 Victims)

The Incident Commander with EOC shall consider the following resources.

- 5- MCI Task Forces (25 units)— each TF may consist of two (2) ALS Units, two (2) Basic Life Support (BLS) Units and one (1) Fire Suppression Unit, two (2) ALS Transport Unit Strike Teams (10 units), one (1) Suppression Unit Strike Team (5 units), two (2) BLS Transport Unit Strike Teams (10 units), two (2) Mass Transit Bus Supply Trailers, Communication Trailer, and Command Staff per local protocol). The 10 closest hospitals and 5 Trauma centers will be notified by Medical Control. The local Warning Point will notify the Emergency Management Agency. Metropolitan Medical Response System (MMRS) may be notified.

Level 5 (over 1,000 Victims)

The Incident Commander with EOC shall consider the following resources.

- 10- MCI Task Forces (50 units),four (4) ALS Transport Unit Strike Teams (20 units), two (2) Suppression Unit Strike Teams (10 units), four (4) BLS Transport Unit Strike Teams (20 units), four (4) Mass Transit Bus Command Vehicles, Supply Trailer(s), Communication Trailer Command Staff per local protocol, Medical Control will notify the 20 closest hospitals and 10 Trauma centers. The local Warning Point will notify the State Warning Point, which may activate one or more Disaster Medical Assistance Teams (DMAT) and MMRS shall be notified.

The predetermined response levels 4 and 5 assigned to the above "Levels of response," will be in addition to the units already on scene. Once local resources have been reasonably depleted, including resources from neighboring jurisdictions through "move-up", "back-up", or "cover" agreements, additional resources as outlined in the Florida Fire Chiefs Association Statewide Emergency Response Plan (SERP) resource inventory will be requested in accordance with the State of Florida, Department of Health Ambulance Deployment Plan.
COMMAND may downgrade or upgrade the assignment at any time

Protocol:

Incident Action Plan (IAP):
The command and control of incidents will be; flexible, built from the ground up, based on the National Response Framework (NRF), National Incident Management System (NIMS), and managed through the use of the Incident Command System (ICS).

Responsive Objectives (ICS 202)

1. Life Safety - To include:
   A. Responders
   B. Victims
   C. Civilian bystanders
   D. Criminal Suspects
2. Incident Stabilization
3. Property Conservation

Organizational Chart (ICS 207)

Assignment Lists (ICS 204)

First arriving unit/COMMAND:

- Establish Incident Command (IC).

To include:

- Name of Command (Named after address)
- Location of Command (Remain visible)

Note: If the first arriving unit is a Fire unit, The Company Officer should remain as the IC or Operations Section Chief/Branch Director depending on incident size. If the first arriving unit is an EMS unit this Officer should conduct a formal transfer of command and resume transport duties, for a Level I MCI, or assume Medical Communications Coordinator (MCC) for a Level II MCI or above.

- First arriving unit shall conduct an all hazards management assessment. This assessment shall include at minimum a scene survey and when appropriate, an assessment for biological indicators of Chemical Biological Radiological Nuclear and Explosive (CBRNE) hazards.
- Establish safety and security boundaries and entry control points. If a CBRNE hazard is present then establishes Red (Hot), Yellow a.k.a. Decon (Warm), Green (Cold) zones.
- Identify Staging Area
- Estimate number of victims
- Request appropriate MCI Level response
- Request additional resources

- Direct remaining crewmembers and 1st wave of arriving personnel to initiate START/Jump START triage (triage performed in accordance with START- utilize color coded ribbons to identify victim status) and treat red patients for immediate life threats.

- Have dispatch notify hospitals immediately of potential victim and request surge capability.

- Assign positions to perform the functions of:
  - Triage, Treatment, Transport, and Staging
- Advise Communications the number of victims, their categories, and insure notification to area hospitals to ready operating room capabilities

- Identifies ingress and egress routes for transport units

- Establish staging area

- Has all responding units regardless of task bring medical gear to treatment area and drop off

- During large scale or complex MCI's designate a MEDICAL Branch to reduce span of control

TRIAGE Group Supervisor

- Organizes the Triage Group to begin initial triage of victims utilizing START/Jump START.

- Advise COMMAND as soon as possible of the number of patients and category.

- Coordinate with TREATMENT or TRANSPORT, and litter bearers to assure that priority victims are transported or moved to treatment area first.

- Directs ongoing triage until all patients have been moved to TREATMENT or transported

- Patients injury/illness severity will be identified as one of the following four categories:
  - Red – Requires immediate transportation.

  - Yellow – Requires transportation but can be delayed.

  - Green – Ambulatory “walking wounded” with minor injuries.

  - Black – Deceased- not transported

Coordination of patients with area hospitals must be accomplished through the incident command system.

The steps of the Start Triage system are as follows:
STEP ONE: Loudly ask anyone within the sound of your voice to move to a designated area if they are able. This will automatically help you sort out the walking wounded and these patients should be tagged **green**.
STEP TWO: In an orderly fashion, move to each patient checking for the status of Airway, Breathing, Circulation and Mental status and tag them using the following rules

Breathing:

- Yes, if respirations less that 30 then check circulation.
- Yes, if respirations greater than 30 =triage RED.
- No, open and clear airway- if breathing begins =triage RED
- No, after clearing airway the patient is not breathing =triage Black

CIRCULATION: (Check pulse)

- Control bleeding
- Weak pulse=triage **RED**
- Strong Pulse= go to metal status check or check capillary refill time (CRT)
- CRT: If less than 2 seconds go to mental status check
- CRT: If greater than 2 seconds=triage **RED**

Mental Status: (Commands "open your eyes, squeeze my hand, etc.)

- Patient follows commands = triage **Yellow**
- Fails to follow simple commands =triage **RED**

Special considerations

- The first assessment finding that produces a RED tag stops further assessment.
- Only correction of life threatening problems, such as severe bleeding, airway obstruction, sucking chest, or tension pneumothorax should be managed during triage.

Secondary triage

- Utilize Triage Tag (METTAG); fill in all information, time permitting.
- Affix the tag to the victim's left hand if possible and remove comer for documentation.
- The triage priority determined in the Treatment Phase should be the priority used for transport.

Litter Bearers

- If not completed attaches Triage Tag (METTAG) to patients left hand if possible and removes corner for documentation.
- Packages patient appropriately considering life over limb
- Moves patient to TREATMENT group supervisor

Group Success Criteria:

1. *All Red patients identified and immediate life threats treated*

2. *All patients triaged correctly and in a timely manner*

3. *Triage conducted continuously*

4. *Patient packaged and moved appropriately for condition*

A simple flow chart below will demonstrate the progression of triage with each individual, including pediatric patients.

Click to view ? Triage Algorithm

TREATMENT Group Supervisor

- Begins treatment area log:
  - Time Patient arrived at TREATMENT
  - Patient number
  - Time patient transferred to TRANSPORT
- Directs personnel to either begin treatment on victims where they lay OR establishes a centralized treatment area.

Considerations for a Treatment Area:

1. Capable of accommodating the number of victims and equipment
2. Consider weather safety and the presence of hazardous materials
3. Designate entry and exit points which are readily visible (Entry control points)
4. On large scale incidents divide the treatment area into three distinct areas based on priority. Use color tarps if MCI trailer is on scene
5. Ensure that enough equipment is available to effectively treat all victims
   - Ensures that all victims are re-triaged and a thorough secondary exam is documented on the triage tag (METTAG) (The rescuer filling out the METTAG will keep a corner of the METTAG for future documentation.)
   - Directs treatment of life threats as needed per protocols.
   - Directs documentation of patient vital signs every 5 minutes.
   - Communicates with TRANSPORT to coordinate transport of the appropriate victims. E.g. one red and one yellow per ambulance.

Litter Bearers

- Moves packaged patients to TRANSPORT group supervisor

Group Success Criteria:

1. *Life threats treated appropriately.*

2. *Vital sign trending monitored and documented every five minutes*

3. *Personal information started on* METTAG

4. *Patient packaged and moved appropriately for condition*

TRANSPORT Group Supervisor

- Begins Transport log
- Time patient arrived at TRANSPORT
- Patient number
- Destination
- Shall coordinate the transport of victims to hospitals
- Establish continuous contact with Medical Communications Coordinator and;

1. Advise overall situation (burns, trauma, smoke inhalation, hazmat exposure, etc.)
2. MCC will survey hospitals utilizing contact information on ' hospital Capabilities and Resources to determine surge capabilities/capacity.
3. MCC will maintain "Hospital Capability Log" for duration of incident

Medical Communications Coordinator (MCC)

MCC's prime function is to maintain a status as to the number of victims and the hospitals readiness to accept victims, coordinate transportation and direct them to the appropriate hospital during a disaster or other situation requiring a high demand of medical resources.

Transport units

- Drops off jump kits at treatment area.
- Transports patients as directed by TRANSPORT.

Group Success Criteria:

1. *Maintains up to date list of hospital surge capability.*
2. *Tracks patient and destination accurately*

STAGING Group Supervisor

- Begins Unit Staging Log.
- Ensures that all personnel stay with their vehicles unless otherwise directed by IC.
- If personnel are directed to assist in another function ensure that the keys stay with each

vehicle, and that all medical gear goes to treatment area.

- Coordinate with each transport the location for a Loading Zone and best route to the zone.

- Maintain a reserve of transport vehicles. When the reserve is depleted request additional units through IC.

- Makes recommendation to command regarding rehab of personnel.

Group Success Criteria:

- *Maintains up to date list of personnel and assignments.*

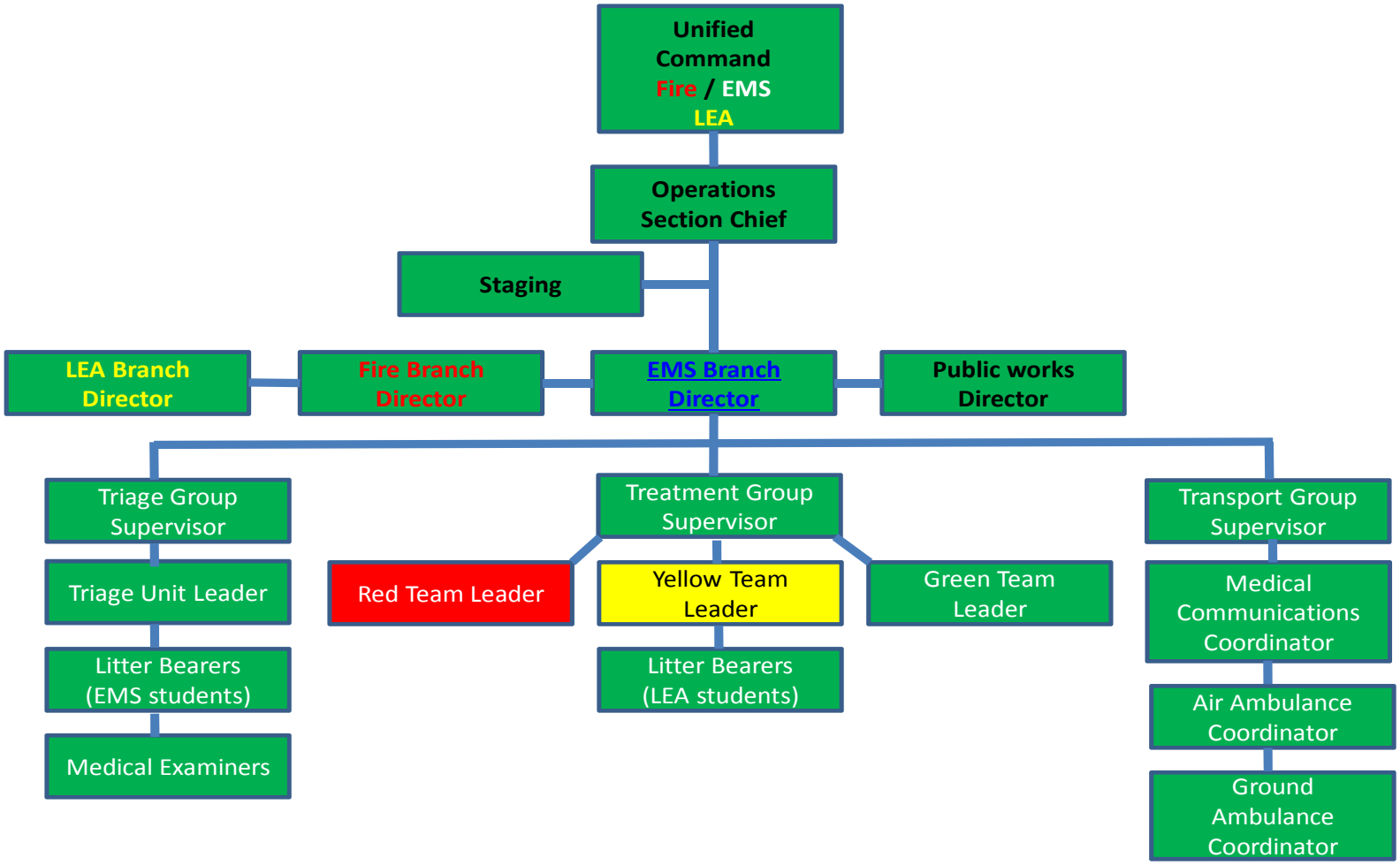
- *Maintains appropriately levels of reserves.*

IV Demobilization

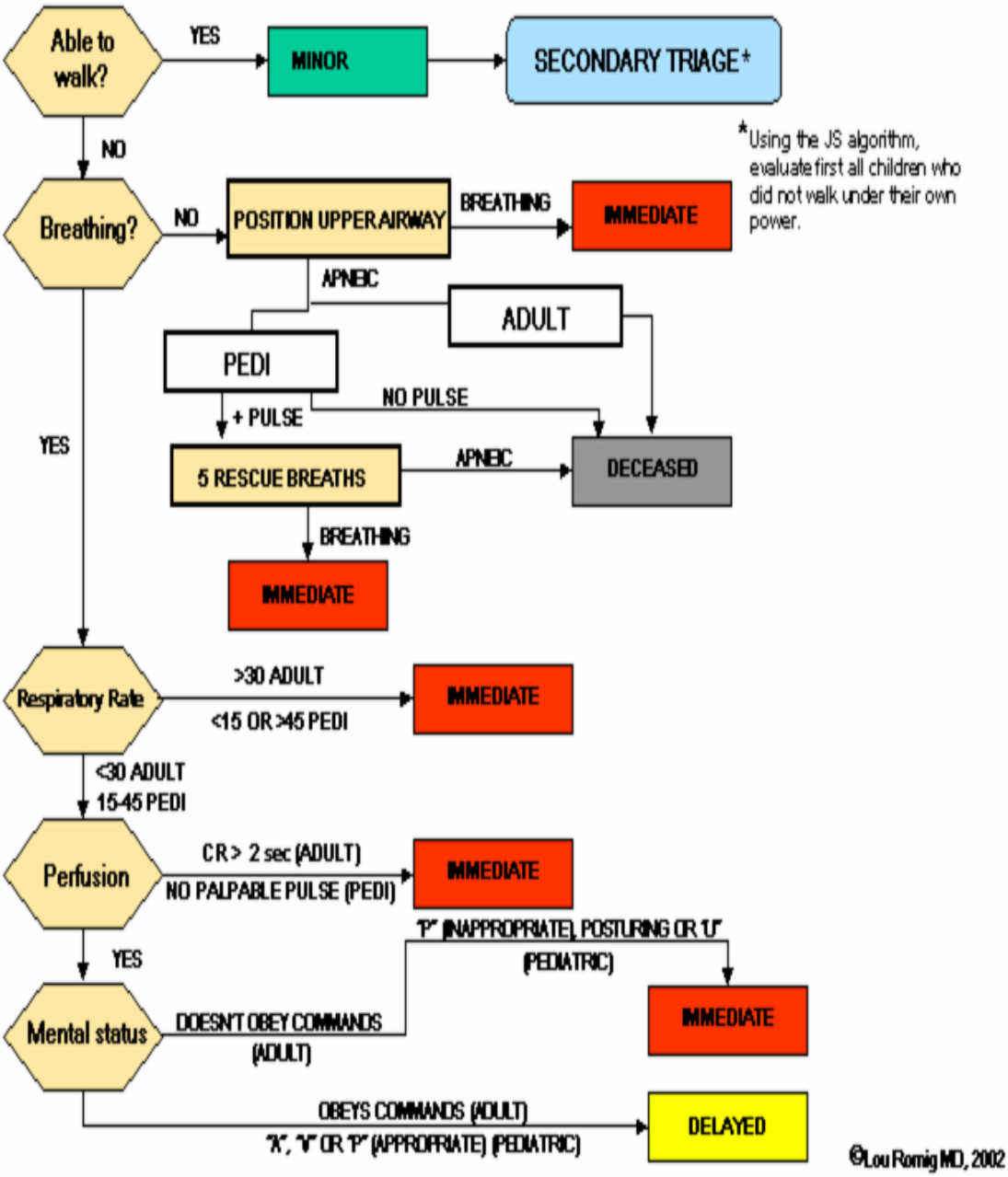
- Units should be rotated to rehab or released in the opposite order that the ICS was established, e.g. triage, treatment, transport, staging.

- When an employee, that has collected corners of the triage tag, is released, these tags should be collected and retained sorted by person. Transport unit tags should be sorted and retained by transport.

Group activity logs, and triage tag corners should be turned in to the IC prior to departure and all material given to the EMS Captain.


Unified Command
Fire / EMS
LEA
Operations Section Chief
Staging
LEA Branch Director
Fire Branch Director
EMS Branch Director
Public works Director
Triage Group Supervisor
Triage Unit Leader
Litter Bearers (EMS students)
Medical Examiners
Treatment Group Supervisor
Red Team Leader
Yellow Team Leader
Green Team Leader
Litter Bearers (LEA students)
Transport Group Supervisor
Medical Communications Coordinator
Air Ambulance Coordinator
Ground Ambulance Coordinator

Combined START/JumpSTART Triage Algorithm



CARDIOVASCULAR PROTOCOL
CHEST PAIN-SUSPECTED CARDIAC
CHAPTER 24.3.1

Issued: May 2010

Revised: April 12, July 12, Dec 13, Feb 14, May 15 Submitted By: EMS Branch Approved By: Medical Director

Protocol:

- Basic Medical Care
- Airway management
- Define pain response using **OPQRST:**
- **O**nset, **P**rovocation, **Q**uality, **R**adiation, **S**everity, **T**ime
- If patient has a history of Diabetes, consider symptoms other than pain to evaluate for a silent MI
- Cardiac monitor -Treat dysrhythmias as indicated
- **Cardiac rhythm and the presence of a blood pressure must be assessed prior to and between each therapeutic measure when treating cardiac dysrhythmias with a pulse.**
- Obtain a 12-lead EKG as soon as possible and before administrating Nitro to rule out Inferior MI (See 12-lead protocol)
    - Repeat 12-lead EKG after treatment or changes in patient condition (as time permits).
    - Vascular Access – If IV access unsuccessful after two attempts and patient remains hypertensive (systolic > 140), administer Nitro. Vitals signs must be obtained after each dose to keep patient normotensive

~~If chest pain is considered cardiac in origin~~

- Administer supplemental oxygen if the patient is dypsneic, hypoxemic, or has obvious signs of heart failure. Providers should titrate therapy, based on monitoring of oxy-hemoglobin saturation, to greater than or equal to 94%.
- Administer **Nitroglycerin***

- Spray/tablet SL every 5 minutes **until pain relieved**
- After administration of **Nitroglycerin** re-check vital signs to ensure the patient is hemodynamically stable
- Apply Nitroglycerin paste, ½" – 2" to the anterior chest wall

***Patients who are suffering an inferior infarct or ischemia should not receive nitrates in any form.**

*Patients who have ingested Viagra, Levitra or Cialis within the last 48 hours should not receive nitrates in any form.

- If patient is not allergic and has not consumed aspirin in the past 6 hours
- Administer **4 chewable baby Aspirin** (total 324mg)
- Patients on coumadin, plavix or aspirin daily will still benefit from aspirin during their cardiac event.
- If pain persists and systolic BP is greater than 100mmHg
- **Morphine Sulfate** 1-5 mg IVP/IO. May repeat in 2 mg increments up to a total 10 mg. For additional pain management contact medical control.
- **Fentanyl –** 25 – 50mgc slow IV/IO/IN q 5 min to a max dose of 150mcg. Medical Control must be contacted for additional doses above 150mcg. Maintain systolic BP >90.

? If hypotensive and lungs are clear

? Refer to Hypotension protocol

If runs of Ventricular Tachycardia occur

? Amiodarone 150mg IV Piggyback over 10 minutes

? Isolated PVC's do not require treatment

For patients with severe nausea and vomiting

? Zofran 4mg slow IV

CARDIOVASCULAR PROTOCOL
CHEST PAIN NON-CARDIAC
CHAPTER 24.3.2

Issued: May 2010
Revised: July 12 Submitted By: EMS Branch Approved By: Medical Director

Protocol:

- Basic Medical Care
- Airway management

Define pain response using **OPQRST:**

- **O**nset, **P**rovocation, **Q**uality, **R**adiation, **S**everity, **T**ime
- Cardiac monitor
- Treat dysrhythmias per protocol

Vascular Access Obtain and document a 12-lead EKG to aid in recognition of a cardiac event
If chest pain is still considered non-cardiac in origin

- Focused physical exam for chest injury
- Ascertain if movement, drinking fluids, eating, deep inspiration, or other changes pain
- Continually re-evaluate for cardiac or respiratory distress
- If patient develops shortness of breath go to respiratory distress protocol
- Administer oxygen if saturation is less than 94%

Click to view ? Chest Pain Differential Diagnosis Chart

Chest Pain Differential Diagnosis

Diagnosis	Pain	Relief	Associated Symptoms	E.K.G.
Aortic Dissection	Excruciating, Tearing, May migrate to arms, neck, back and shoulders	Analgesics Resection	Blood pressure differences in arms, unequal arterial pulses	No changes
Pericarditis	Sharp, Sudden, Constant, Increases with change in position and respirations	Sitting up Leaning forward Anti-Inflammatory drugs	Pericardial friction rub	Global ST & T-wave elevations
Pulmonary Embolism	Sudden, Sharp	Analgesics	Hemoptysis, Shortness of breath	Right Axis Shift
Pericardial Tamponade	Sharp or dull pain	Pericardio-centesis	Distant heart sounds, Shortness of breath, Pulsus paradoxus, JVD	Diffuse, non-specific changes
Angina	Sudden onset, Crushing, Substernal, May radiate to jaw, neck or back	Rest, Vasodilatation, equalize O2 supply and demand	Diaphoresis	Elevated ST segments resolve with relief of pain
Prinzmetal's Angina	At rest, Cluster timing, 12:00pm-8:00am Young males	Vasodilatation		Elevated ST segments resolve with relief of pain
Unstable Angina	At rest, Unrelieved with NTG, Change on existing pattern of pain or new onset pain	Equalize O2 supply and demand	Diaphoresis	Transient ST and T wave changes resolve with relief of pain
Myocardial Infarction	Sudden onset, Crushing, Substernal, May radiate to jaw, neck or back	Analgesics, re-perfusion, firbrinolytic, (mechanical or surgical)	Diaphoresis; weakness, shortness of breath, anxiety, feeling of doom, nausea, pale or ashen color skins, rales.	Elevated ST segment, Significant Q waves; T wave inversion, dysrhythmias

CARDIOVASCULAR PROTOCOL
CONGESTIVE HEART FAILURE PULMONARY EDEMA
CHAPTER 24.3.3

Issued: May 2010

Revised: July 12, Dec 13, Feb 14 Submitted By: EMS Branch Approved By: Medical Director

Protocol:

- Basic Medical Care
- Airway management
- Vascular Access
- Administer **Nitroglycerin 0.4 mg** sublingual
- Administer **Nitropaste** ½" – 2" on anterior chest
  - Remove if systolic B/P drops less than 100

Patients who have ingested Viagra (sildenafil) or other erectile dysfunction medications within 48 hours should not receive nitrates in any form

- **Morphine** Sulfate 1-5 mg IVP/IO
- May administer **Albuterol** 2.5 mg in 3 ml **Normal Saline** via nebulizer if wheezing
- If hypotensive refer to Shock Protocol
- **Severe respiratory distress, CPAP** in addition to the above
  - If respiratory failure is imminent, be prepared to intubate and provide positive pressure ventilation.

MEDICAL CONTROL OPTIONS:

- Repeat any of the above Standing Orders

CARDIOVASCULAR PROTOCOL
CARDIAC ARREST MANAGEMENT
CHAPTER 24.3.4

Issued: May 2010

Revised: June 11, Aug 11 Submitted By: Technical Services Approved By: Medical Director

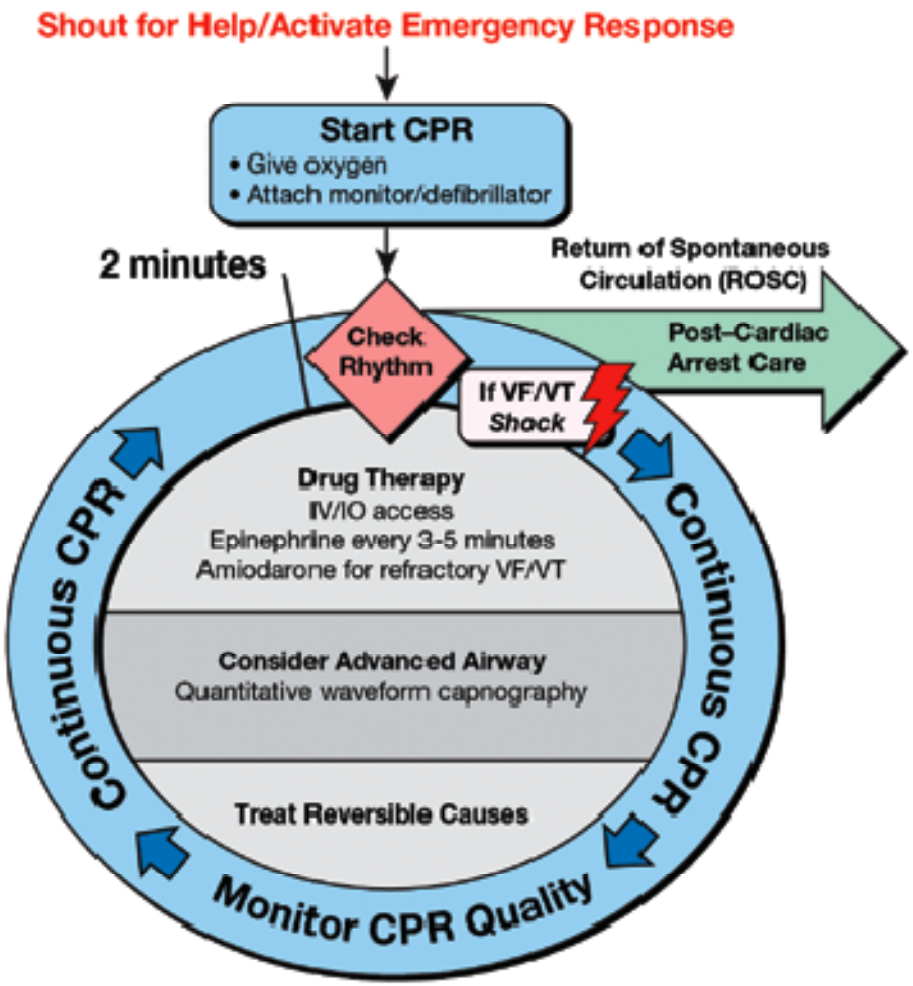
1. **CPR**
   - Compressions at a rate of 100/min.
     - Avoid interruption
     - Minimize delays between delivery of shock(s)
   - Ratio of 30:2 (15:2 for infants and Children with 2 rescuers).
   - Compressions should not be interrupted for any reason not even to give breaths
     - Chest compressions are then delivered continuously at 100/ min for 2 minutes intervals.
     - Ventilations are provided once every 6-8 seconds. Avoid excessive ventilations
     - Ventilate with enough volume to make chest rise.
   - Rescuers should switch roles (ventilator and compressor) every two minutes to minimize compressor fatigue and deterioration of quality of compressions.
   - Apply pads and monitor as soon as possible to identify a shockable rhythm, then follow protocols according to rhythm

2. **Airway management:**
   - Basic: oral or nasophyngeal airways should be used to maintain a patent airway with BVM
   - Advanced: place an advanced airway when needed, minimizing interruptions in CPR during placement. Examples include endotracheal tube, King LT tube, and LMA.
   - Continuous ETCO2 Waveform Capnography is required on every patient with and ETT or King LTD in place because this provides the most reliable means of confirming proper tube placement and assuring adequate CPR (i.e. you will see a CO2 waveform and measurements of at least 20 mm/Hg if CPR is adequate)

3. **Work flow of the cardiac arrest:**
   - A team leader should assign roles to each member of the rescue team to make sure everyone knows what tasks they are responsible for completing.
   - Team Roles include an airway manager, compressor, IV/Drug administration person and team leader.
   - The sequences of tasks that are to be accomplished during a cardiac arrest are demonstrated in the 2 pictures below. The V-Fib/Pulseless VT protocol has the specific details of each two minute segment. For all others follow this sequence as it applies.

Click to view ? AHA Circular Cardiac Arrest Algorithm

Adult Cardiac Arrest



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 P_{ETCO_2} <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
- Abrupt sustained increase in P_{ETCO_2} (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
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

CARDIOVASCULAR PROTOCOL DYSRHYTHMIA ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY(PEA)

CHAPTER 24.3.5

Issued: May 2010

Revised: June 11, July 12, May 13 Submitted By: EMS Branch Approved By: Medical Director

Protocol

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

- Advanced Life Support
- Follow Cardiac Arrest Management protocol
- Consider and treat possible causes:
- Epinephrine 1 mg IV/IO every 3-5 min during arrest
  - Strong consideration to replacement of 2nd dose of Epi with 40 units Vasopressin.
- Drug overdoses (see specific drug OD/toxicology section)
  - Glucagon 3 mg IV/IO for calcium channel and B blocker OD
  - Calcium Chloride 1 gram IV/IO for calcium channel blocker OD
    - Avoid if patient on Digoxin / Lanoxin
  - Sodium Bicarbonate 1 mEq/kg IV/IO for Tricyclic antidepressant OD
  - Naloxone (Narcan) 2 mg IV/IO/IN for possible narcotic OD
    - May be given IM/IN if no IV/IO available
- If no response to resuscitative efforts after 20 minutes refer to Termination of CPR Protocol, 24.1.4.

Potential causes if Asystole Treatment

- Hypovolemia (most common)
- Normal Saline 1-2 liters IV/IO
- Hypoxia
- Secure airway and ventilate
- Hydrogen Ion- acidosis
- Sodium Bicarbonate 1 mEq/kg IV/IO
- Hyperkalemia (end stage renal disease)

- Sodium Bicarbonate 1 mEq/kg IV/IO
- Calcium Chloride 1 Gram IV/IO slow
- Hypothermia
- Active rewarming
- Tablets (drug overdose)
- See above
- Tamponade, cardiac
- Normal Saline 1-2 liters IV/IO
- Tension pneumothorax
- Needle Thoracostomy
- Thrombosis, coronary (MI)
- Expedite transport
- Thrombosis, pulmonary (clot in lung)
- Expedite transport

Contact Medical Control for any additional orders or questions

CARDIOVASCULAR PROTOCOL
TACHYCARDIC DYRHYTHMIAS WITH A PULSE
CHAPTER 24.3.6

Issued: May 2010

Revised: June 11, Aug 11, May 13 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Basic Life Support

- Supplemental Oxygen if O2 Saturation is <94%
- Obtain Blood Pressure

Advanced Life Support

- Full ALS Assessment and Treatment including IV/IO access
- Apply Monitor and identify rhythm
- Always consider other underlying causes and treat accordingly (dehydration, sepsis/fever, alcohol withdrawal)
- Do not delay treatment if patient is unstable by obtaining 12 lead ECG unless diagnosis is in question
- Defined by rate >150 bpm

Unstable Tachycardia Dysrhythmias

- Hypotension (Systolic BP <90)
- Acutely Altered Mental Status, Ischemic Chest pain
- Signs of Shock
- Dyspnea
- Acute Heart Failure

If Unstable: Synchronized Cardioversion

- Narrow Regular : 50-100J
- Narrow Irregular: 120-200J

- Wide Regular: 100J

- Wide Irregular, (Torsades De Pointes): defibrillate at 200J, unsynchronized

** If Rhythm does not convert on first shock, increase energy dose in a stepwise fashion based on original energy setting, for example if first shock delivered was 50J increase to 100J, from 100J increase to 120J, 150J then 200J.

**Consider sedation prior to Cardioversion with 2-5 mg of Versed. Do not delay cardioversion if patient is extremely unstable

**If a pediatric patient please use the Broselow tape

**If patient is unstable, but has a regular and narrow complex tachycardia adenosine can be used prior to cardioversion.

If Stable, narrow QRS<0.12 seconds

- Perform Vagal maneuvers

- (If regular) Adenosine 6mg rapid IVP followed by a flush of Normal Saline

- If no response in 2 minutes, 12mg rapid IVP followed a flush of Normal Saline

- If no response in 2 minutes, Diltiazem 0.25 mg/kg (20 mg in normal adult) IV over 2 minutes

- If no response in 15 minutes, Diltiazem 0.35 mg/kg (25 mg in normal adult) IV over 2 minutes.

- If no response consider synchronized cardioversion

- If patient is allergic to Diltiazem, or no response, contact medical control.

If stable, wide QRS >0.12 seconds

- Start by placing defibrillation pads on the patient

- (ONLY If regular and monomorphic) Adenosine 6mg rapid IVP followed by a flush of Normal Saline

- If no response in 2 minutes, Adenosine12mg rapid IVP followed by a flush of Normal Saline

- If no response, Amiodarone 150 mg over 10-15 minutes in 50 ML Normal Saline using a Macro Drip infusion set to run at no more than 1drop per second.

- If Amiodarone is not available, Lidocaine 1-1.5mg/kg over 1-2min can be used and if ectopy is depressed start a 2mg/min infusion

If hyperkalemia is suspected in any wide complex tachycardias (e.g. renal failure patient) administer the following medications:

- Calcium Chloride 1 gram IV-Contraindicated if patient is on Digoxin/Lanoxin

- Sodium Bicarbonate 1mEq/kg IV.

If patient presents with Stable, polymorphic wide QRS >0.12 seconds (Torsades)

- Magnesium Sulfate 2-4 g slow IV in 10 ml NS over 1-2 minutes

- If no response, **Amiodarone** 150 mg over 10-15 minutes**.** 150 mg in 50 ml NS using a MACRO drip infusion set run at no more than 1 drop/second

- Repeat **Amiodarone** 150 mg infusion as above over 10 minutes every 10-15 minutes (Maximum of 450 mg total)

If Unstable or if no response to the above measures

- ***Unsynchronized*** Cardioversion as noted above

If patient becomes unstable at any time, revert to synchronized cardioversion.

Any questions or additional orders needed call medical control

CARDIOVASCULAR PROTOCOL DYSRHYTHMIAS-BRADYCARDIA
CHAPTER 24.3.7

Issued: May 2010

Revised: June 11, Aug 11, Sept11, May 13, Feb 14, May 15

Submitted By: EMS Branch Approved By: Medical Director

Protocol:

Basic Life Support

- Supplemental oxygen

Advanced Life Support

- Full ALS Assessment and Treatment noted in basic medical care protocol
- Do not delay treatment if patient is unstable by obtaining 12 lead ECG unless diagnosis is in question

Note: The following therapies are indicated only when serious signs and symptoms are present. If symptoms are mild, provide supportive care and expedite transport.

Symptomatic (SBP < 90 mm Hg, altered mental status, pallor, cyanosis, diaphoresis, dizziness, shock, edema, respiratory difficulty, nausea, vomiting or severe chest pain)

- Atropine 0.5 mg IVP Repeat every 3 minutes as needed

- (Maximum 0.04 mg/kg) If symptoms persist after Atropine
- For the treatment of adults with symptomatic and unstable bradycardia, chronotropic drug infusions (dopamine) is recommended as an alternative to pacing.

- Dopamine infusion at 10-20 mcg/kg/min titrated to maintain systolic BP > 90 mm Hg

OR

- Epinephrine inject 1ml of (1:1000 epi) into 9cc of Normal saline, mix and administer 1-2ml Q2min PRN bradycardia (HR <60)

- Consider Epinephrine Drip if patient still exhibits profound bradycardia

- Inject 2.5ml of (1:1000 epi) into a 250ml bag of Normal Saline (creates a solution of 10mcg/ml) and run the drip at 2ml/min

Note if there is any delay in establishing an IV, establish and IO or you can move onto transcutaneous pacing

If symptoms persist or patient found to be in 2nd or 3rd degree AV block.

- Initiate transcutaneous pacing (do not use Asynchronous Pacing)
- Start at lowest milliamps(mA); increase until electrical capture with pulses achieved
- Start rate at 70 and increase rate to achieve systolic BP = 90 mm Hg (Max 80 beats/minute)
- if patient condition and time allows (hold if SBP < 90 mmHg) pretreat your patient with:
- Fentanyl 25 – 50mcg IV/IO/IN Q5 minutes prn for pain x3, may repeat as needed (0.5-1mcg/kg with max 3mcg/kg)

OR

- Versed 1 mg, slow

IV/IN If above unsuccessful

In addition, if the patient is suspected of having a beta-blocker or calcium channel blocker overdose consider:

a. Glucagon 3-5 mg IVP (0.05 mg/kg). May be repeated in 10-15 min (prophylactically administer Zofran 4mg IV prior to Glucagon administration).

OR

b. Calcium Chloride 10mL of 10% solution IV over 5 minutes. (prophylactically administer Zofran 4mg IV prior to Calcium Chloride administration)

CARDIOVASCULAR PROTOCOLS
LVAD

CHAPTER 24.3.14

Issued: July 2012 Revised:

Submitted By: EMS Branch Approved By: Medical Director

This protocol applies to the management of all patients who have a left ventricular assist device (LVAD) implanted. A ventricular assist device is a mechanical pump that is used to support heart function and blood flow in people who have weakened hearts. The device takes blood from the lower chamber of the heart and helps pump it to the body and vital organs just as a healthy heart would.

Basic Life Support

- Establish patent airway
- Supplemental oxygen if any respiratory signs or symptoms are present
- Listen to heart sounds. In a functioning device you should hear a continuous whirling sound.
- Locate the device usually found at the patient's waist. Look at the controller and identify which device is in place. Locate the colored sticker and match this to the color coded EMS guide found in the Medical protocol appendices.
- Using this guide, intervene appropriately based on the type of alarm and device.
- Record and monitor vital signs.

Note* In a majority of these patients a pulse will not be palpable. This occurs because the LVAD unloads the ventricle in a continuous fashion and therefore the aortic valve may not open with each contraction.

A manual blood pressure may not be obtainable, but with an automated cuff you will be able to obtain a pressure with a narrow pulse pressure. Your treatment of the patient will be based on the mean arterial pressure. In these patients, the normal range for mean arterial pressure is greater than 60 and less than 90.

Pulse oximetry may not be accurate due to the continuous flow nature of the LVAD.

- If the patient is unconscious, unresponsive to stimuli, and pulseless listen to the patient's chest. If you hear the whirling sound of the LVAD, DO NOT PERFORM CPR. The LVAD device has been surgically placed into the left ventricle and CPR could dislodge this device, causing death. If you cannot hear the device then CPR should be performed per cardiac arrest protocol.
- Record blood glucose level if any weakness, altered mental status or history of diabetes.

- Nothing by mouth, unless patient is known diabetic with hypoglycemia and is able to self-administer oral glucose paste, or a glucose containing beverage.

- Above all else please remember that these patients, along with their families, have been well trained in the care of themselves and their devices. LISTEN TO THEM!

- Call the number on the device for the LVAD coordinator on call.

- Patients always carry a “backup bag” which contains 2 extra fully charged batteries, and a second controller. Please make sure to always bring this emergency backup equipment with them to the hospital.

Advanced Life Support

If advanced airway/ventilation management is needed, perform these interventions:

- Perform cardiac monitoring

- Evaluate a 12 lead ECG if chest pain or ischemic equivalent symptoms (i.e. abdominal pain above the umbilicus, nausea, dizziness, chest tightness or shortness of breath.)

- If patient meets Stemi criteria on 12 lead ECG, follow Protocol 24.7.15.

- All dysrhythmia’s should be treated in accordance with appropriate Dysrhythmia Protocol.

- For conscious electrical defibrillation, the patient may be sedated with Versed 1mg if the MAP is greater than 65mmHg.

- Record and monitor continuous O2 saturation, sometimes not obtainable with LVAD patients. In addition you may utilize End Tidal Co2 capnography.

- IV normal saline, KVO or IV lock.

- If evidence of dehydration, bolus 250 ml of Normal Saline with a max of 500 ml of NS until patient is normotensive, (= or > 65 MAP). If patient shows signs of Congestive Heart Failure (crackles on ausculatation of lungs, JVD or peripheral edema) withhold fluid bolus.

- If hypoglycemic follow Protocol 24.4.5

- If patient suffering from severe nausea or vomiting, follow Protocol 24.4.11.

- Transport patient to nearest appropriate Emergency Department

- Minimize on scene time when possible

Transport these patients to the closest LVAD center. Bring the significant other or caretaker if possible to act as an expert on the device, especially if the patient is unconscious or unreliable.

Please refer to the LVAD EMS guide located in the appendix for further information on field care of these devices.

Click below to download and view the January 2014 EMS Guide

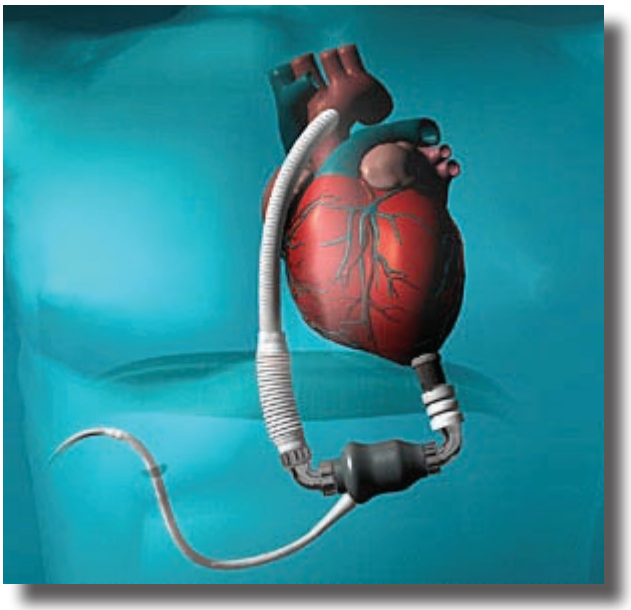
http://www.mylvad.com/sites/mylvadrp/files/Field Guides Master Document.pdf

EMS Guide
January 2014

MECHANICAL
CIRCULATORY
SUPPORT
ORGANIZATION

This guide is produce by MCSO –
The Mechanical Circulatory Support Organization
It is produced by VAD Coordinators from some of the largest and most successful VAD implantation hospitals in the US. It has been vetted by experts on VADS in Air Medical Transport and EMS. It should not replace the operator manual as the primary source of information.

Questions and Answers
Ventricular Assist Device



What is a Ventricular Assist Device (VAD)?

A ventricular assist device (VAD) is a mechanical pump that's used to support heart function and blood flow in people who have weakened hearts.

How does a VAD work?

The device takes blood from a lower chamber of the heart and helps pump it to the body and vital organs, just as a healthy heart would.

What are the parts of a VAD?

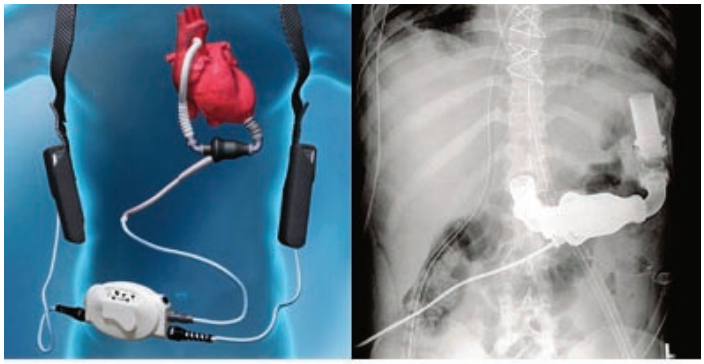
The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver the blood to your body; and a power source.

What is the power source?

The power source is either batteries or AC power. The power source is connected to a control unit that monitors the VAD's functions. The batteries are carried in a case usually located in a holster in a vest wrapped around the patients shoulders.

What does the control unit or controller do?

The control unit gives warnings, or alarms, if the power is low or if it senses that the device isn't working right. It is a computer.



The portability of the HeartMate II enables patients to resume many of their normal daily activities.

Color Coding System

MOST patients have a tag located on the controller around their waist that says what type of device it is, what institution put it in and a number to call. Most importantly is the color of the tag – it matches this EMS Field Guide and allows you to quickly locate the device you are caring for.

HEARTMATE II

HEARTWARE

HEARTMATE XVE

THORATEC PVAD/IVAD

FREEDOM DRIVER
Total Artificial Heart

DURAHEART

Patient Management For VADs

1. Assess the patients airway and intervene per your usual protocol.

2. Auscultate Heart Sounds to determine if the device is functioning and what type of device it is. If it is continuous flow device, you should hear a “whirling sound”.

3. Assess the device for any alarms.

4. Look on controller found around the waist of the patient or in the VAD PAK and to see what color tag and device it is.

5. Match the color on the device tag to the EMS Guide.

6. Intervene appropriately based on the type of alarm, tag (device) and EMS Guide.

7. Start Large Bore IV.

8. Assess vital signs – Use Mean BP with Doppler – with the first sound you hear is the Mean Arterial Pressure (MAP).

9. If no Doppler, use the Mean on the non invasive blood pressure machine.

10. Transport to closest VAD center. Call the number on the device to get advice.

11. Bring all of the patient’s equipment.

12. Allow the trained caregiver to ride in the transport vehicle if possible to act as a expert on the device in he absence of consciousness in the patient.

HeartMate II®

1. **Can I do external CPR?**
   Only if absolutely necessary
2. **If not, is there a "hand pump" or external device to use?**
   No.
3. **If the device slows down (low flow state), what alarms will go off?**
   A red heart alarm light indicator and steady audio alarm will sound if less than 2.5 lmp. Can give a bolus of normal saline and transport to an LVAD center.
4. **How can I speed up the rate of the device?**
   No, it is a fixed speed.
5. **Do I need to heparinize the patient if it slows down?**
   Usually no, but you will need to check with implanting center.
6. **Can the patient be defibrillated while connected to the device?**
   Yes.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   No.
8. **Does the patient have a pulse with this device?**
   May have weak pulse or lack of palpable pulse.
9. **What are acceptable vital sign parameters?**
   MAP 70 - 90 mm Hg with a narrow pulse pressure
10. **Can this patient be externally paced?**
    Yes.

FAQs

- May not be able to obtain cuff pressure (continuos flow pump).
- Pump connected to electric line exiting patient's abdominal area and is attached to computer which runs the pump.
- Pump does not affect EKG
- All ACLS drugs may be given.
- No hand pump is available.
- A set of black batteries last approximately 3 hours, gray batteries last 8-10 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring **ALL** of the patient's equipment with them.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

Trouble Shooting HeartMate II®

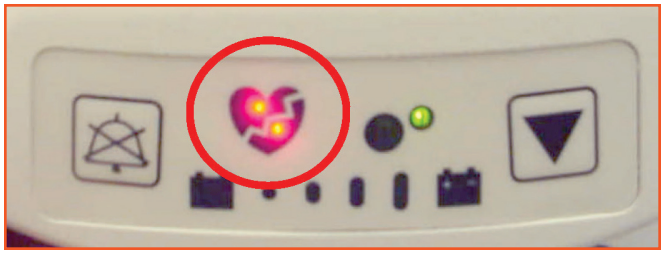
When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. *(see changing batteries section on next page)*
- If pump does not restart, change controllers. *(see changing controllers section on next page)*

Alarms: Emergency Procedures

Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.



JANUARY 2014

Trouble Shooting HeartMate II®

Changing Batteries

WARNING: At least one power lead must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 3 and 4)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 1)
- Controller will start beeping and flashing green signals.
- Replace with new battery by lining up **RED** arrows on battery and clip. (Figure 2)
- Slide a new, fully-charged battery (Figure 4) into the empty battery clip by aligning the **RED** arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and green flashing will stop.
- Repeat previous steps with the second battery and battery clip.

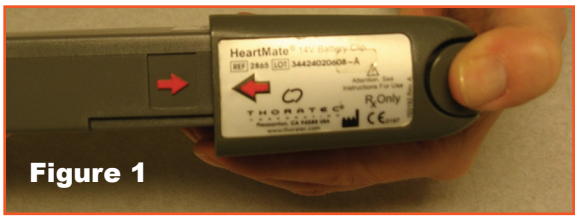


Figure 1


Figure 2

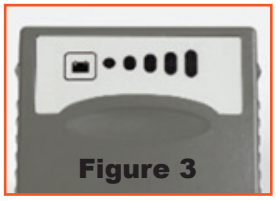


Figure 3

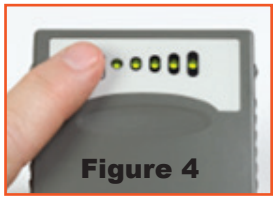
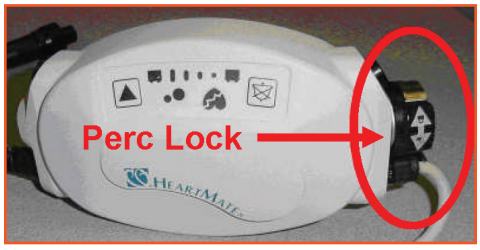


Figure 4

Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the **RED** arrows. **ALARMS WILL SOUND-THIS IS OK.**

- Depress the silence alarm button (upside-down bell with circle) until the alarm is silenced on the new, replacement Controller.
- Rotate the perc lock on the replacement controller in the direction of the "unlocked" icon until the perc lock clicks into the fully- unlocked position. Repeat this same step for the original Controller until the perc lock clicks into the unlocked position.



- Disconnect the perc lead/driveline from the original controller by pressing the metal release tab on the connector socket. The pump will stop and an alarm will sound.

Note: The alarm will continue until power is removed from the original Controller. ***Getting the replacement Controller connected and the pump restarted is the first priority.***

- Connect the replacement Controller by aligning the BLACK LINES on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.

Step 2. Check the powersource to assure that power is going to the controller.

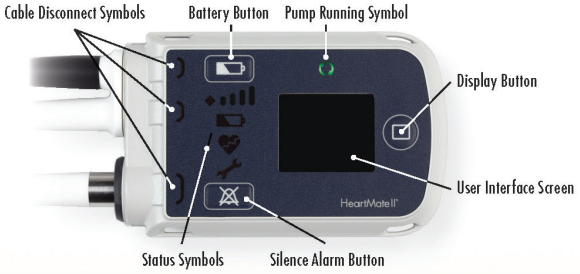
Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.

- After the pump restarts, rotate the perc lock on the new controller in the direction of the "locked" icon until the perc lock clicks into the fully-locked position. If unable to engage perc lock to the locked position, gently push the driveline into the controller to assure a proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.

JANUARY 2014

HeartMate II® Controller Comparison Guide

POCKET CONTROLLER™



3 Modes: Run, Charge, Sleep
Run: Driveline + Power source connected.
Charge: Only power source connected.
Sleep: No driveline or power source connected; ready to use.

Backup Battery
An emergency backup battery is built into Pocket Controller, powering the pump for 15 minutes in the absence of an external power source. The backup battery is supplied NONSTERILE.

Event Logger
Pocket Controller includes date/time records in event history. Pocket Controller can store 240 events.

Green Pump Running Symbol
Green "pump running" symbol signifies that the pump is on and running.

Controller Buttons
Display Button: Enables viewing of pump parameters and backup battery charge status.
Silence Alarm Button: Silences hazard alarms for 2 minutes and advisory alarms for 4 hours.
Display Button + Silence Alarm Button Together: Displays previous six alarms.
Battery Button: Displays the battery power gauge when pressed. Activates a self test when held for 5 seconds then released. Enters sleep mode when driveline and external power are disconnected and button is held for 5 seconds then released.

Self Test
Press and hold the Battery Button for 5 seconds.

Low Power
Yellow Diamond Symbol: Displayed when only 15 minutes of external power is remaining.
Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.
Backup Battery Mode: Entered after external power is depleted. Provides 15 minutes of internal emergency backup battery power.
Power Saver Mode: Entered when pump has run on backup battery for 15 minutes. Pump Speed is reduced to the set Low Speed Limit.

Starting the Pump
>8000 RPM: Pump starts automatically.
<8000 RPM with Backup Battery: Start pump by pressing any button on Pocket Controller.
<8000 RPM with no Backup Battery: Pump can only be started via System Monitor.

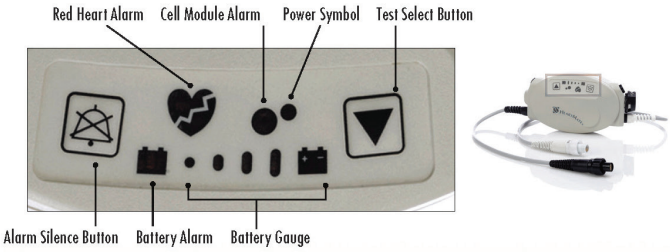
System Monitor Event History Screen

PI Event:	10/04/13 07:20	4.8	9590	5.6	5.4	PI Event
System Information:	10/04/13 01:30	4.8	6900	5.7	6.6	* System Information

Compatibility
System Monitors I and II, Power Module, Power Module Patient Cable (14 Volt), 14 Volt Lithium-Ion Batteries and Battery Clips.

Alarms
For a review of alarms and their meanings, reference HeartMate II Alarms for Clinicians, item 107526. Pocket Controller includes a yellow wrench icon to denote advisory alarms. Note that Pocket Controller includes drivelines fault detection.

EXTERNAL PERIPHERAL CONTROLLER (EPC)



2 Modes: On, Off
On: Driveline + Power source connected.
Off: No driveline or power source connected.

Cell Module Battery
No backup battery. The cell module battery powers an audible tone if EPC is removed from power while the driveline is connected. The cell module battery is supplied STERILE.

Event Logger
EPC does not include date/time records in event history. EPC can store 120 events.

Green Power Symbol
Green light only means that the controller is receiving power. Listen over the pump pocket for confirmation that the pump is running.

Controller Buttons
Alarm Silence Button: Displays the battery fuel gauge. Also silences hazard alarms for 2 minutes and advisory alarms for 4 hours.
Test Select Button: Activates a self test when held for 3 seconds.
Note: EPC does not include a display button or user interface screen. The Display Module is used to view pump parameters and alarm events.

Self Test
Press and hold the Test Select Button for 3 seconds.

Low Power
Yellow Battery Symbol: Displayed when only 15 minutes of external power is remaining.
Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.
Power Saver Mode: Entered when the battery voltage falls to a critically low level. Pump Speed is reduced to 8000 RPM.

Starting the Pump
>8000 RPM: Pump starts automatically.
<8000 RPM: Start pump by pressing Alarm Silence Button or Test Select Button on EPC.

System Monitor Event History Screen

PI Event:	10/04/13 07:20	4.8	9590	5.6	5.4	
System Information:	10/04/13 01:30	4.8	6900	5.7	6.6	*

Compatibility
System Monitors I and II, Power Module, Power Base Unit (PBU), Power Module Patient Cable (12 Volt and 14 Volt), 14 Volt Lithium-Ion Batteries and Battery Clips, 12 Volt SLA and NiMH Batteries and Clips.

Alarms
For a review of alarms and their meanings, reference HeartMate II Alarms for Clinicians, item 103851. Note that EPC does not include driveline fault detection.

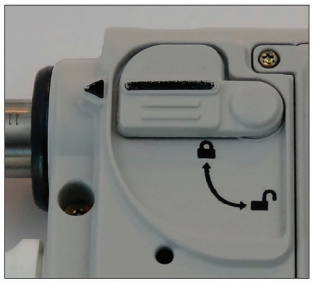
JANUARY 2014

HeartMate II Controller Comparison Guide

DRIVELINE CONNECTION

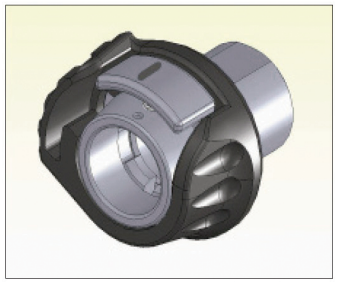
Pocket Controller:
A safety tab is located on the back of the controller.

Unlocked

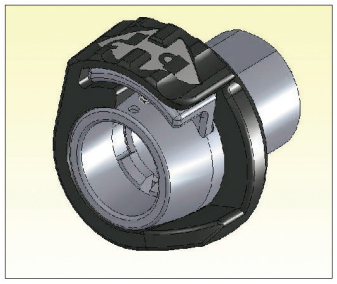


Locked

External Peripheral Controller (EPC):
A percutaneous lock is located on the side of the controller.

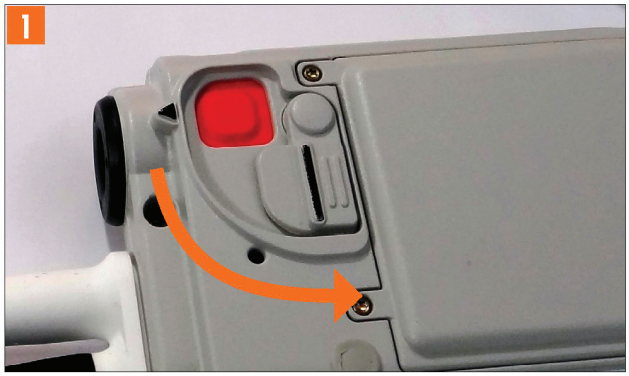


Unlocked

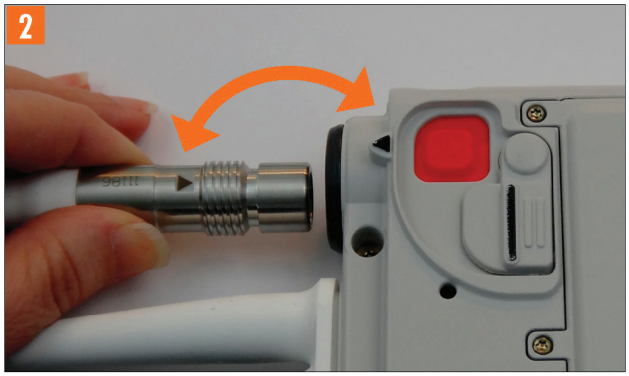


Locked

The Pocket Controller driveline connection and locking mechanism are different from the EPC. To insert and lock the driveline into Pocket Controller:

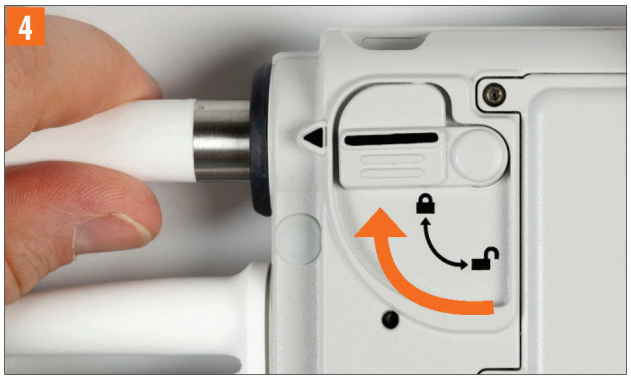


Slide the safety tab back to expose the red button.



Align the arrow on the driveline to the arrow on the Pocket Controller. Firmly insert the driveline until it snaps into place.

Tug gently on the metal portion of the driveline to ensure that it is fully engaged.



Slide the safety tab over the red button. Ensure the safety tab completely covers the red button.

THORATEC® CORPORATION for Life

JANUARY 2014

HeartMate II® with Pocket Controllers

1. **Can I do external CPR?**
   Only if absolutely necessary
2. **If not, is there a "hand pump" or external device to use?**
   No.
3. **If the device slows down (low flow state), what alarms will go off?**
   A red heart alarm light indicator and steady audio alarm will sound if less than 2.5 lmp. Can give a bolus of normal saline and transport to an LVAD center.
4. **How can I speed up the rate of the device?**
   No, it is a fixed speed.
5. **Do I need to heparinize the patient if it slows down?**
   Usually no, but you will need to check with implanting center.
6. **Can the patient be defibrillated while connected to the device?**
   Yes.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   No.
8. **Does the patient have a pulse with this device?**
   May have weak pulse or lack of palpable pulse.
9. **What are acceptable vital sign parameters?**
   MAP 70 - 90 mm Hg with a narrow pulse pressure
10. **Can this patient be externally paced?**
    Yes.

FAQs

- May not be able to obtain cuff pressure (continuos flow pump).
- Pump connected to electric line exiting patient's abdominal area and is attached to computer which runs the pump.
- Pump does not affect EKG
- All ACLS drugs may be given.
- No hand pump is available.
- A set of black batteries last approximately 3 hours, gray batteries last 8-10 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring **ALL** of the patient's equipment with them.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

Trouble Shooting HeartMate II® with Pocket Controllers

When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. *(see changing batteries section on next page)*
- If pump does not restart, change controllers. *(see changing controllers section on next page)*

Alarms: Emergency Procedures

Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.

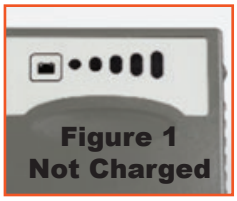
JANUARY 2014

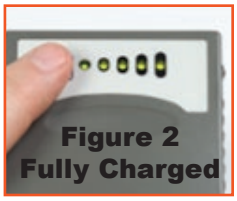
Trouble Shooting HeartMate II® with Pocket Controllers

Changing Batteries

WARNING: At least one power lead must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient's accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 1 and 2)
- Remove only **ONE** battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 3)
- Controller will start beeping, flash yellow signals and will read **power disconnect** on the front screen.
- Replace with new battery by lining up **RED** arrows on battery and clip. (Figure 4)
- Slide a new, fully-charged battery (Figure 2) into the empty battery clip by aligning the **RED** arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and yellow flashing will stop.
- Repeat previous steps with the second battery and battery clip.





Changing Controllers

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient's travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the **RED** arrows.

- On the back of the replacement controller, rotate down the perc lock so the red tab is fully visible. Repeat this step on the original controller until the red tab is fully visible.
- Disconnect the drive line from the original controller by pressing down on the red tab and gently pulling on the metal end. The pump will stop and an alarm will sound. **Note:** The alarm will continue until the original controller is put to sleep. You can silence the alarm by holding down the silence button. **Getting the replacement controller connected and pump restarted is the first priority.**
- Connect the replacement Controller by aligning the BLACK ARROWS on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

Step 1. Firmly press the Silence Alarm or Test Select Button to restart the pump.

Step 2. Check the powersource to assure that power is going to the controller.

Step 3. Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.

- After the pump restarts, rotate up the perc lock on the new controller so the red tab is fully covered. If unable to engage perc lock to a fully locked position, gently push the driveline into the controller to assure proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.
- Hold down battery symbol for 5 full seconds for complete shutdown of old controller.

JANUARY 2014

HeartWare® Ventricular Assist System

1. **Can I do external CPR?**

   Chest compressions may pose a risk of dislodgment – use clinical judgment. If chest compressions are administered, confirm function and positioning of the pump.

2. **If not, is there a "hand pump" or external device to use?**

   No.

3. **If the device slows down (low flow state), what alarms will go off?**

   The device runs at a fixed speed. If a low flow state occurs, an alarm will be heard, and the controller display will show a yellow triangle and "Low Flow – Call" message.

4. **How can I speed up the rate of the device?**

   It is not possible to adjust the pump speed in the prehospital setting. Okay to give IV fluids.

5. **Do I need to heparinize the patient if it slows down?**

   Call the accepting VAD facility for guidance.

6. **Can the patient be defibrillated while connected to the device?**

   Yes.

7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**

   No, defibrillate per protocol.

8. **Does the patient have a pulse with this device?**

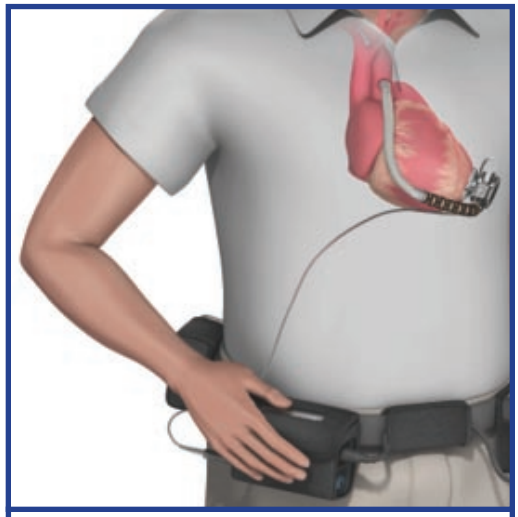
   The patient may not have a palpable pulse. Depending on the patient's own heart function, you may be able to feel a thready pulse.

9. **What are acceptable vital sign parameters?**

   Goal Mean Arterial Pressure (MAP) is <85 mmHg. Use a Doppler as the first option to assess blood pressure. If you are using a Doppler, place the blood pressure cuff on the patient arm. As you release the pressure in the blood pressure cuff, the first sound you hear with the Doppler is the MAP. If that is not available, use a non-invasive BP (NIBP).

10. **Can this patient be externally paced?**

    Yes



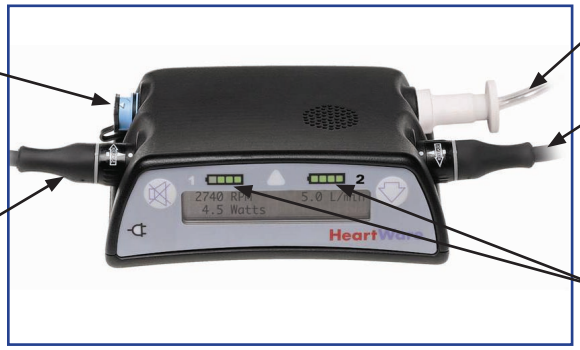
FAQs

- May not be able to obtain cuff pressure (continuous flow pump)
- Pump connected to electric line (driveline) exiting patient's abdominal area and is attached to computer (controller) which runs the pump.
- Pump does not affect EKG, but patient may or may not be symptomatic even iwth ventricular arrhythmias.
- All ACLS drugs may be given.
- No hand pump is available. This is a rotary (continuous flow) pump with typical speed ranges of 2400 – 3200 RPMs. The patient should have back-up equipment.
- The controller draws power from one battery at a time. A fully charged battery will provide 4-6 hours of power. Both the battery and controller have status lights to indicate the amount of power remaining.
- Transport by ground to implanting facility if possible.
- Be sure to bring **ALL** of the patient's equipment with them.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

January 2014

HeartWare® Ventricular Assist System Emergency Operation



CONTROLLER

BATTERY

ALARM ADAPTER

- **Used to silence the internal NO POWER ALARM.**
- **Should only be used on a controller that is NOT connected to a patient's pump.**
- **Must be inserted into the blue connector of the original controller after a controller exchange BUT before the power sources are disconnected or the NO Power alarm will sound for up to two hours.**

DRIVELINE CONNECTION

To Connect to Controller:

- Align the two red marks and push together. An audible click will be heard confirming proper connection. (Figure A)
- The Driveline Cover must completely cover the Controller's silver driveline connector to protect against static discharge. (Figure B)
- NOTE: an audible click should be heard when connecting the Driveline or Driveline extension to the controller. Failure to use the Driveline Cover may cause an Electrical Fault Alarm.

Figure A

Figure B

CONNECTING POWER TO CONTROLLER

To Connect a Charged Battery:

- Grasp the cable of the charged battery at the back end of the connector (leaving front end of connector free to rotate)
- Line up the solid white arrow on the connector with the white dot on the Controller.
- Gently push (but DO NOT twist) the battery cable into the Controller until it naturally locks into place; you should hear an audible click.
- Confirm that the battery cable is properly locked on the controller by gently pulling the cable near the controller power connector.
- DO NOT force the battery cable into the controller connector without correct alignment as it may result in damaged connectors .

TO DISCONNECT A DEPLETED BATTERY

- Make sure there is a fully charged battery available to replace the depleted one.
- Disconnect the depleted battery by turning the connector sleeve counterclockwise until it stops.
- Pull the connector straight out from the controller.

JANUARY 2014

HeartWare® Ventricular Assist System Emergency Operation

STEPS TO EXCHANGE THE CONTROLLER

Step 1: Have the patient sit or lie down.

Step 2: Place the new controller within easy reach.

Step 3: Connect back-up power sources (batteries or AC Power) to the new controller.

- Confirm that the power cables are properly locked on the controller by gently pulling on the cable near the connector.
- A “Power Disconnect” alarm will activate if a second power source is not connected to the new controller within 20 seconds of controller power up
- A “VAD Stopped” alarm will activate if the pump driveline is not connected to the new controller within 10 seconds - this alarm will resolve once the pump driveline is connected

Step 4: Pull back the white driveline cover from the original controller’s silver connector.

Step 5: Disconnect the driveline from the original controller by pulling the silver connector away from the controller. Do not disconnect by pulling on the driveline cable. A “VAD Stopped” alarm may activate. Don’t panic. You can silence the alarm after restarting the pump, which is the priority.

Step 6: Connect the driveline to the new controller (align the two red marks and push together). If the “VAD Stopped” alarm was active on the new controller, it will now resolve.

Step 7: The pump should restart. Verify the pump is working (RPM, L/min, Watts).

Step 8: **IF THE PUMP DOES NOT RESTART, CALL FOR MEDICAL ASSISTANCE IMMEDIATELY.**

Step 9: Insert the Alarm Adapter into the blue connector on the original controller.

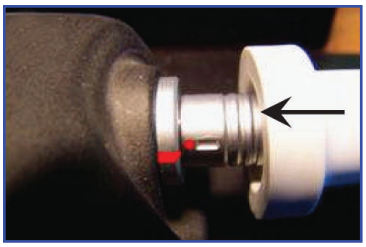
- Disconnect both power sources from the original controller.
- The controller will be turned off and all alarms silenced.

Step 10: Slide the white driveline cover up to cover new controller’s silver connector.

Step 11: Contact the VAD Center or Implanting hospital for a new backup controller.

Step 3

Step 4



Step 6

Step 9

Step 10

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HeartWare® Ventricular Assist System Troubleshooting

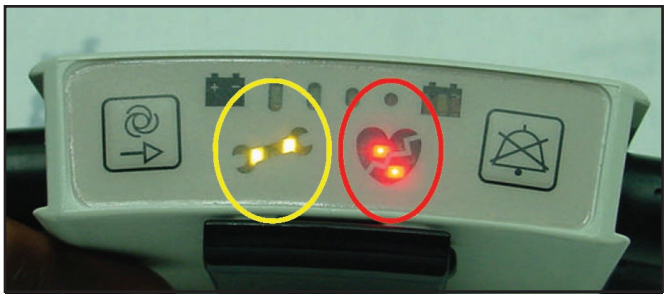
ALARM TYPE	ALARM DISPLAY (Line 1)	ACTION (Line 2)
High - Critical (FLASHING RED)	VAD STOPPED	CONNECT DRIVELINE
	VAD STOPPED	CHANGE CONTROLLER
	CRITICAL BATTERY 1	REPLACE BATTERY 1
	CRITICAL BATTERY 2	REPLACE BATTERY 2
	CONTROLLER FAILED	CHANGE CONTROLLER
MEDIUM (FLASHING YELLOW)	CONTROLLER FAULT	CALL ACCEPTING VAD HOSPITAL
	CONTROLLER FAULT	CALL: ALARMS OFF
	HIGH WATTS	CALL ACCEPTING VAD HOSPITAL
	ELECTRICAL FAULT	CALL ACCEPTING VAD HOSPITAL
	LOW FLOW	CALL ACCEPTING VAD HOSPITAL
	SUCTION	CALL ACCEPTING VAD HOSPITAL
LOW (SOLID YELLOW)	LOW BATTERY 1	REPLACE BATTERY 1
	LOW BATTERY 2	REPLACE BATTERY 2
	POWER DISCONNECT	RECONNECT POWER 1
	POWER DISCONNECT	RECONNECT POWER 2

JANUARY 2014

HeartMate® XVE

1. **Can I do external CPR?**
   No.
2. **If not, is there a "hand pump" or external device to use?**
   Yes. Pump at a rate of 60 -90 beats per minute.
3. **If the device slows down (low flow state), what alarms will go off?**
   A red heart alarm light indicator and steady audio alarm will sound if less than 1.5 lpm. Check for hypovolemia or right heart failure and treat if red heart alarm persist after treatment consider performing a controller exchange.
4. **How can I speed up the rate of the device?**
   Give volume of IV fluids.
5. **Do I need to heparinize the patient if it slows down?**
   Please check with the accepting hospital.
6. **Can the patient be defibrillated while connected to the device?**
   No.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   Yes, disconnect from power/batteries first, initiate hand pumping, disconnect controller from driveline, defibrillate the patient, remove hand pump, reattach driveline to controller, and then reattach the power source.
8. **Does the patient have a pulse with this device?**
   Yes, the device produces a Pulsatile flow. Heart rate is independent of pump rate.
9. **What are acceptable vital sign parameters?**
   The BP will vary. 110/80 -140/80. If greater, call the accepting hospital.
10. **Can this patient be externally paced?**
    Yes, keep MA less than 40.

Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.



Heartmate XVE Controller showing Yellow Wrench & Red Heart indicator lights

Hand pump & white purge valve

HAND PUMPING PROCEDURE

Push in white purge valve

Press the black ball while holding down the white purge valve.

Release purge valve.

Count to 10, push white purge valve & black bulb should re-inflate.

JANUARY 2014

HeartMate® XVE

Steps To Exchange Controller

Step 1: Place new System Controller within easy reach. Have Hand Pump nearby.

Step 2: Disconnect Power source (Batteries, PBU, or EPP) from System Controller. The System Controller will alarm and the pump will stop. (Figure 2A and Figure 2B)

Figure 2A

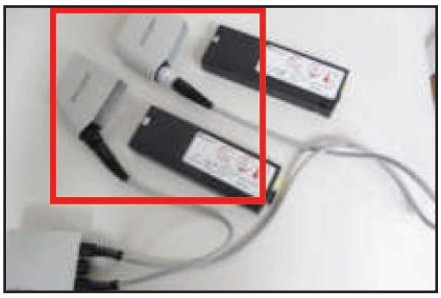


Figure 2B

Step 3: Disconnect the Driveline (coming from the patient) from the System Controller by pushing down on the black release button and gently pulling the Driveline connector out of the XVE System Controller socket. (Figure 3)

Figure 3

Step 4: Connect the Driveline to the new, replacement XVE System Controller by lining up the small black arrows on the Driveline connector and System Controller socket **FIGURE 4A.** Gently push the connector into the socket until it snaps into place **FIGURE 4B**. The new System Controller will alarm if the System Controller Battery Module is NOT in place. This is normal and should stop after the System Controller Battery Module is inserted. (Figure 4A, Figure 4B and Figure 4C)

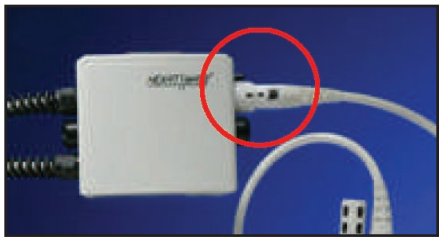


Figure 4A

Figure 4B

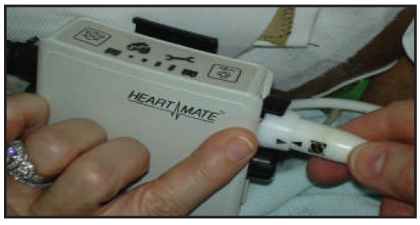


Figure 4C

Step 5: Connect the new System Controller to power source (Batteries, PBU, or EPP). Your pump will restart and alarm will stop.

Step 6: If the pump does not restart, disconnect System Controller from power source and call for medical assistance; then immediately begin hand pumping.

Figure 5

Air Transport Consideration: In rotor wing and fixed wing aircraft flying at heights lower than 10,000 feet-when using the hand pump for external CPR, you must re-purge the bulb every 2000 feet in ascent and 1000 feet in descent. This will assure you have consistent cardiac output.

JANUARY 2014

Trouble Shooting HeartMate® XVE

Half Yellow Wrench
Once per second beep

- Controller inoperable
- Controller malfunction Rate control fault
- Current limit advisory

1. Check all XVE system controller connections.
2. Change vent filter, and check vent part for foreign matter.
3. Replace XVE system controller.
4. Replace the power base unit (PBU) cable.
5. Replace the PBU.
6. If the Yellow Wrench persists and the XVE LVAD remains operational, seek additional help.

Yellow Wrench
Once per second beep

- Power cable or battery is disconnected

Reconnect cable/battery or reinsert battery into battery clips

Flashing Yellow Battery
No audio tone

- XVE system controller battery module voltage low

1. Replace XVE system controller batter module.
2. Perform XVE system controller self-test to cleat alarm.

Yellow Battery
No audio tone

- Low voltage advisory **(less than 15 minutes of battery power remain)**

Change to alternate power source.

NOTE: If the XVE system controller is connected to the pecutaneous tube and all power is removed, the XVE system controller will elicit a continuous audio tone signalling the loss of power. This condition is not accompanied by a visual alarm.

Red Heart
Continuous Audio Tone

- NO OP or LOW BEAT RATE (less than 35 BPM)
- LOW STROKE VOLUME* (less than 25ML)
- LOW FLOW* (less than 1.5 LPM)

1. Check all XVE system controller connections.
2. Change vent filter, and check vent part for foreign matter.
3. Replace XVE system controller.
4. Replace the power base unit (PBU) cable.
5. Replace the PBU.
6. If the Yellow Wrench persists and the XVE LVAD remains operational, seek additional help.

Red Battery
Continuous Audio Tone

- LOW VOLTAGE **(less than 15 minutes of battery power remain)**

1. XVE LVAD will automatically to Power Saver mode (50BPM)
2. Immediately replace batteries or connect to power base unit (PBU) cable.
3. If AC or battery power is unavailable, use emergency power pack (EPP).
4. If AC power battery power and EPP are unavailable, disconnect power and initiate emergency hand pumping.

Flashing Yellow Battery, Red Heart, & Yellow Wrench
Continuous Audio Tone

- XVE system controller disconnected from patient.

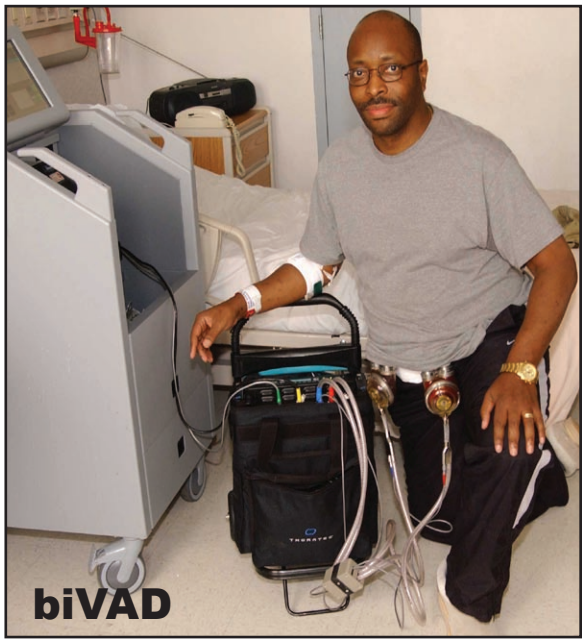
1. Check XVE system controller cable connection to XVE LVAD percutaneous tube.
2. Insure that both batteries are properly inserted into the battery clips; XVE system controller power cable are properly connected to the power base unit (PBU) Cable.
3. Ensure that PBU Cable is connected to back of PBU.
4. If condition persists, disconnect power and initiate hand pumping.
5. Seek additional help.

***NOTE: DO NOT HAND PUMP if there is blood in the vent port. Conditions that affect pump filling, such as hypertension, hypovolemia, or mechanical defects, may limit the restoration of normal pump flows until the conditions are resolved. Hand pumping may be ineffective under these conditions.**

JANUARY 2014

Thoratec PVAD™ w/TLC II Driver

1. **Can I do external CPR?**
   No.
2. **If not, is there a "hand pump" or external device to use?**
   Yes, find the blue or red hand bulbs.
3. **If the device slows down (low flow state), what alarms will go off?**
   Low flow alarms: Loss of fill alarm will occur
4. **How can I speed up the rate of the device?**
   Give volume of IV fluids.
5. **Do I need to heparinize the patient if it slows down?**
   Only if it stops. Patient will be anti coagulated on Coumadin.
   Only heparinize if the pump stops.
6. **Can the patient be defibrillated while connected to the device?**
   Yes. Nothing needs to be disconnected. Patient should be placed on battery power BEFORE defibrillation.
7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   No. If the defibrillation is unsuccessful, disconnect pump and continue to defibrillate.
8. **Does the patient have a pulse with this device?**
   Yes.
9. **What are acceptable vital sign parameters?**
   Normal blood pressure parameters.
10. **Can this patient be externally paced?**
    Usually in BiVAD configuration, if yes the ECG not important to treat. Because both sides of the heart are supported, there is little need to pace regardless of the rhythm seen on ECG.



IVAD is implanted inside the abd cavity and is attached to the same TLC II driver on the outside.

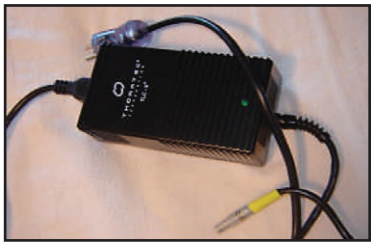
Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.

- These patients have biventricular support through 2 pumps: right and left.
- EKG will NOT correlate with the patient's pulse.
- Patient may be in any arrhythmia, but because they have biventricular support — DO NOT TREAT arrhythmias. Only RVAD or LVAD patients should be treated for arrhythmias.
- Bring all extra batteries & electrical adaptor along during transport. This system is electrically driven.
- The pumps are driven by a compressor called the TLC II driver. The pneumatic hoses and cables plug into the top of the TLC II driver.
- If the Driver loses power, malfunctions, or stops, use the hand pump(s). (hand pump instructions on back of this page)
- Continue hand pumping and then, as soon as possible, replace the TLC II Driver with the backup Driver.

TCL-II Driver

Battery Charger

Batteries loaded into battery slots on TLC-II Driver



AC Power adapter – plug into yellow port on driver

- Backup Driver accompanies the patient at all times. (Driver replacement instructions on back of this page)
- **WARNING:** If the pump has stopped and blood is stagnant in the device for more than a few minutes (depending on the coagulation status of the patient), there is a risk of stroke or thromboembolism. BEFORE the device is restarted or hand pumping is initiated, contact the implanting center for anticoagulation direction.

JANUARY 2014

PVAD/IVAD

Type of Device: pulsatile

What is an LVAD?

Left Ventricular Assist Devices are pumps surgically attached to patients' hearts to pump blood for the ventricle. There are three basic parts to all VAD systems. The pump, a computer with lamps and alarms, and a power source.

Why do patients get VADs?

Patient who have been treated for heart failure but in spite of optimal care continue to suffer from life limiting heart failure. Patients may be on the heart transplant list but the transplant team is worried the patient may die before a suitable donor is found, bridge to transplant. Pts who are not candidates for transplant but suffer from end stage heart failure may also be implanted as destination therapy.

How do VADs work?

Most vads implanted nationally create continuous flow. Blood comes from patients own ventricle into the pump then a turbine like spinning fan pushes the blood out into the aorta then the body. A cable connects the pump inside with the computer/controller and batteries outside the body. The pump needs a constant power supply.

biVAD

IVAD is implanted inside the abd cavity and is attached to the same TLC II driver on the outside.

Do's

1. Page the On Call Perfusionist. Call the Tower OR at 3316 to ask for the beeper number.
2. Give whatever medications you want. (no medication contraindication)
3. Defibrillate if indicated
4. Hand pump only if the devise has stopped pumping, left faster than right.

Don'ts

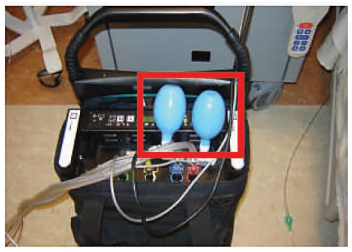
1. NO CHEST COMPRESSIONS.
2. NO MRI.
3. Don't panic if the ECG is at one rate. The LVAD rate is at another, and the RVAD rate is a third.

Questions:

1. CPR: NO
2. Hand pump: yes called hand bulbs
3. low flow alarms: Loss of Fill alarm
4. speed up device: fluids
5. heparin: only if it stops. Patient has to be on Coumadin
6. defib: yes
7. disconnect for defib: no
8. pulse: yes
9. Vital signs: Normal BP parameters
10. externally pace: Usually in Bi VAD configuration if yes the ECG not important to treat

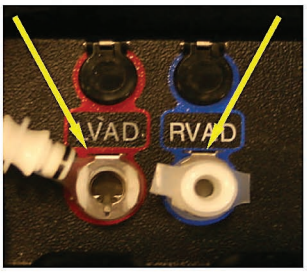
JANUARY 2014

Hand Pumping Instructions

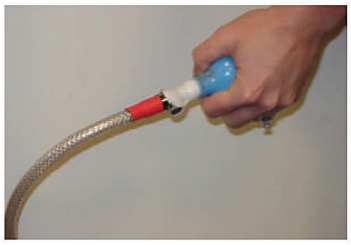


Step 1: Obtain hand pump(s) from carrying case. Note: One (1) hand pump is needed for each VAD.

Step 2: Depress metal clip(s) to disconnect the pneumatic lead(s) from the TLC II Driver.



Step 3: Connect the hand pump(s) to the pneumatic lead(s).



Step 4: Squeeze hand pump(s) once per second. Use your foot if necessary.
Note: For 2 VADs (BiVADs), squeeze each hand pump at the same rate. Never hand pump the right VAD (RVAD) faster than the left VAD (LVAD), as this may cause pulmonary edema.

Switching to Backup TLC-II Driver

Step 1: Insert a fully-charged battery (stored in carrying case) into each battery slot of backup TLC-II driver.

Step 2: Turn on key switch

Step 3: Depress metal clip(s) to remove white occluder from pneumatic port(s) :

- LVAD port is **RED**.
- RVAD port is **BLUE**.
- Note: for BiVADS, switch LVAD first. Do NOT remove occluder caps from both ports at the same time (or from unused port during single VAD support), or system will depressurize.

Step 4: Disconnect pneumatic lead(s) from primary Driver (or hand pump) and connect to backup Driver.

Step 5: Disconnect electric lead(s) from primary Driver and connect to backup Driver.

Step 6: Place Driver in AUTO mode, if necessary.
Note: Backup Drivers are preprogrammed with a patient's unique settings.

Step 7: Verify full signal(s) is/are ejecting completely.

Step 8: Remove key and place in carrying case pocket.

Step 9: Connect to external power, if available by using the AC power adapter cord.

All modes of emergency transport are acceptable for VAD patients.
Aviation electronics will NOT interfere with VAD operation (and vice versa).

Air Transport Consideration: In rotor wing and fixed wing aircraft flying at heights lower than 10,000 feet-when using the hand pump for external CPR, you must re-purge the bulb every 2000 feet in ascent and 1000 feet in descent. This will assure you have consistent cardiac output.

JANUARY 2014

Questions and Answers for Total Artificial Heart

What Is A Total Artificial Heart?

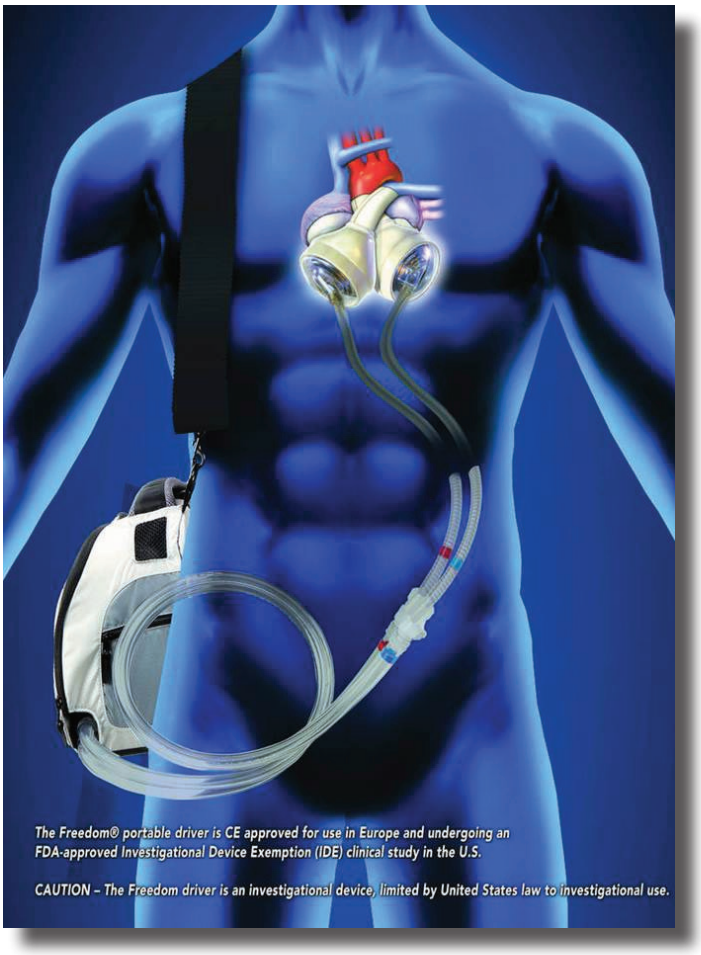
A total artificial heart (TAH) is a device that replaces the two lower chambers (ventricles) of the heart. You might benefit from a TAH if both of your ventricles don't work due to end-stage heart failure.

What are the parts of a TAH?

The SYNCARDIA has tubes that, through holes in the abdomen, run from inside the chest to an outside power source.

What is the power source?

Shortly after the TAD is implanted, the patient is switched to the Freedom driver. This is a mobile "driver" for patients to who are ambulatory. The patient considered discharge from the hospital while awaiting a transplant but ultimately received a heart transplant while still an inpatient. Higher rates of survival to transplant have already been proved with the TAH. Potential benefits for the portable Freedom driver include increased mobility, decreased cost, and improved quality of life.



The portability of the Total Artificial Heart (TAH) enables patients to resume many of their normal daily activities.

Patient Management For TAHs

1. Assess the patients airway and intervene per your protocol.

2. Auscultate heart sounds but you can usually hear them without a stetho scope. Since this is pulsatile you should hear two sounds if properly functioning.

3. Assess the device for any alarms.

4. Look on controller usually found around the waist of the patient and to see what color tag and device it is. The backpack or freedom driver should have a pink tag on it. It will have the type of device this is and contact information to the implantation center.

5. Match the color on the device tag to the EMS Guide. The tag on the backpack or freedom driver's colored tag should matches the ems guide. This will tell you how to manage any alarms.

6. Intervene appropriately based on the type of alarm, tag (device) and EMS Guide.

7. Start Large Bore IV.

8. Assess Vital Signs. REMEMBER THERE IS NO EKG. THE PATIENT IS ASYSTOLIC.

9. YOU SHOULD BE ABLE TO GET A SYSTOLIC AND DIASTOLIC BLOOD PRESSURE.

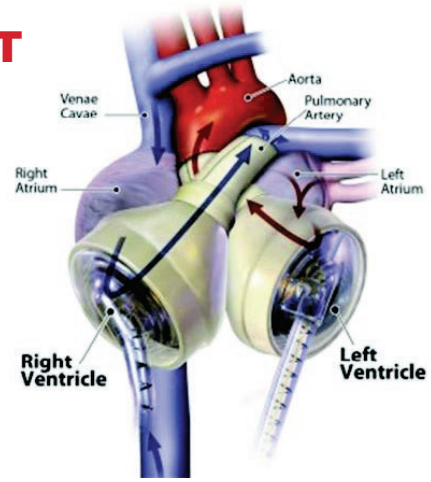
10. Transport to the closest center that can care for a TAH. Look on the PINK tag to find out this information.

11. Bring all of the patients equipment.

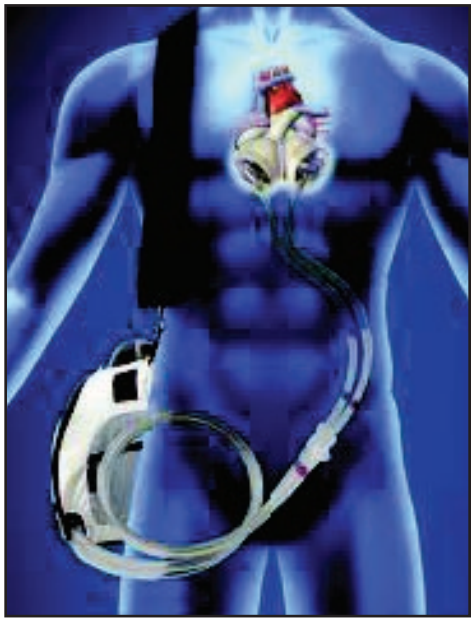
12. Bring the significant other if possible to act as a expert on the device in the absence of consciousness in the patient.

Total Artificial Heart Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART
(not a left ventricular assist device-LVAD)



1. **Can I do external CPR?**
   No. Will need to rapidly exchange to the backup driver.
2. **Is there a "hand pump" or external backup device to use?**
   No.
3. **Can I give vasopressive IV drugs like epinephrine, dopamine or dobutimine?**
   Never give vasopressive drugs, especially epinephrine. These patients primarily have sysmptomatic hypertension and rarely have symptoms of hypotension. Most IV vasopressive drugs can be fatal to a TAH (Total Artificial Heart) patient.
4. **Can I speed up the rate of the device?**
   No. The device has a fixed rate between 120-140-BPM.
5. **What is the primary emergency intervention for a TAH (Total Artificial Heart)?**
   Nitroglycerin sublingual for symptomatic hypertension.
6. **Can the patient be defibrillated or externally paced while connected to the device?**
   No. There is no heart.
7. **What if the patient is symptomatic and the Freedom Driver is alarming with a continuous alarm and the red light ?**
   If the pump has failed or a line is disconnected or kinked, the patient may pass out within 30 seconds. Even when alarming, the device should continue to pump. When in doubt, immediately change out he Freedom™ Driver immediately. Then quickly check for loose or kinked connections.
8. **Does the patient have a pulse with this device?**
   Yes. The device produces Pulsatile flow. The device is pneumatically driven and is normally loud.
9. **What are acceptable vital sign parameters?**
   The BP will vary. Normal range 100-130 systolic and 60-90 diastolic.
10. **What kind of Cardiac rhythm should be displayed?**
    Asystole.



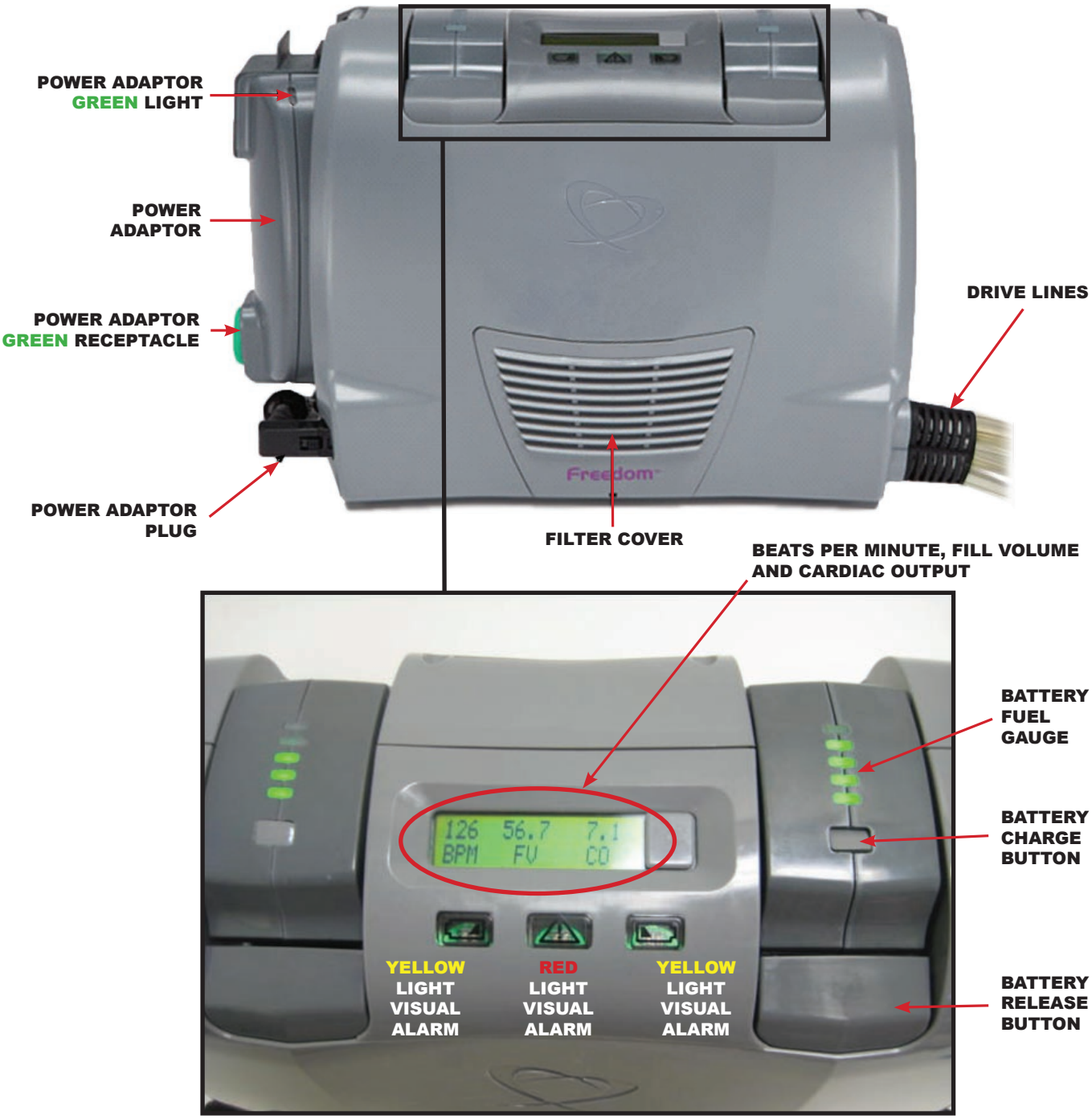
"Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport .ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010"

JANUARY 2014

Trouble Shooting Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART

(not a left ventricular assist device -LVAD)



Freedom™ Driver System

IN THE EVENT OF AN EMERGENCY

Immediately notify VAD coordinator listed on the medical alert bracelet or tag attached to the console - please identify the device as a total artificial heart.

"Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport .ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010"

JANUARY 2014

HOW TO RESPOND TO FREEDOM™ DRIVER ALARMS

There is no way to mute an Alarm.

ALARM	HEAR	SEE	MEANING	WHAT YOU SHOULD DO
Battery Alarm	Loud Intermittent Tone	Yellow Battery LED Flashing	One or both of the Onboard Batteries have less than 35% remaining charge (only two green lights display on the Battery Fuel Gauge).	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power (NOTE: Once the batteries are charged above 35% the Battery Alarm will stop) .
			Onboard Battery is incorrectly installed.	Reinsert Onboard Battery until locked in place. If Battery Alarm continues, insert a new Onboard Battery.
			One Onboard Battery missing.	Insert charged Onboard Battery into Freedom™ Driver until locked in place.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The temperature of the Driver is too hot or too cold.	Remove any objects that are blocking the Filter Cover and/or Fan and check the filter.
			The internal temperature of the Driver is too hot.	Move the Freedom Driver to a cooler or warmer area.
Fault Alarm	Loud Continuous Tone	Red Alarm LED Solid	Valsalva Maneuver: Strenuous coughing or laughing, vomiting, straining during a bowel movement, or lifting a heavy weight.	Relax/interrupt Valsalva Maneuver.
			Kinked or disconnected drive lines.	Straighten or connect drive lines.
			Driver is connected to External Power without at least one correctly inserted Onboard Battery.	Insert a charged Onboard Battery into the Freedom™ Driver until locked into place.
			One or both of the Onboard Batteries have less than 30% remaining charge.	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power. (NOTE: the Fault Alarm will continue and will change into a Battery Alarm as the Onboard Batteries recharge. Once the Onboard Batteries are charged above 35%, the Battery Alarm will stop.)
			Malfunction of the Driver	If the steps above do not stop the Fault Alarm, switch to Backup Freedom Driver. Return to implant hospital.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The internal temperature of the Driver is too hot.	Remove any objects that are blocking the Filter Cover and / or Fan and check filter.
			The temperature of the Onboard Batteries is too hot or too cold.	Move the Freedom Driver to a cooler or warmer area.

You must immediately address the issue that caused the Alarm.

"Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport .ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010"

JANUARY 2014

Switching from Primary to Backup Freedom™ Driver

CAUTION: It is recommended to have TWO people exchange the primary Freedom Driver for the backup Freedom Driver. Make sure all items and accessories are closely available before attempting to exchange Drivers.

Setting up the Backup Freedom™ Driver

1. Remove the drive line caps from the ends of the Drive lines.
2. Insert one charged Onboard Battery. The driver will immediately start pumping. (*Figure 1*)
3. Remove the Orange Dummy Battery. (*Figure 1*)
4. Insert the second charged Onboard Battery. (*Figure 2*)
5. If possible, connect the backup Driver into a wall power outlet.
6. Your Freedom™ Driver is now ready to connec to the patient.

FIGURE 1

FIGURE 2

BEATS PER MINUTE, FILL VOLUME AND CARDIAC OUTPUT

FIGURE 3

Continued on next page.

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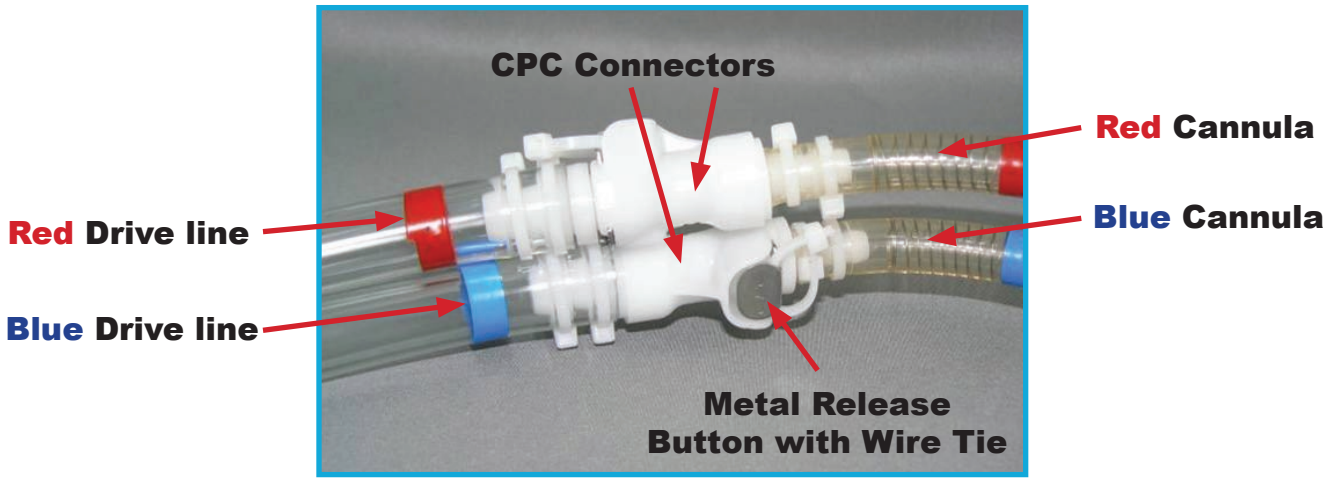
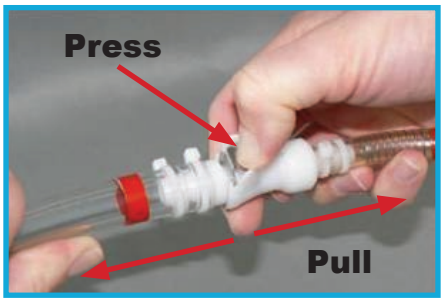
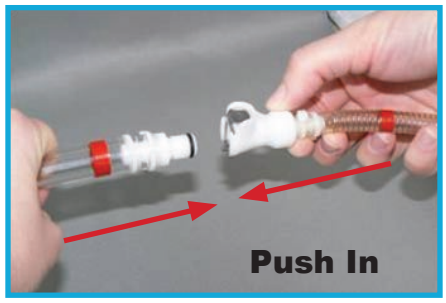
JANUARY 2014

Switching from Primary to Backup Freedom™ Driver

Continued on from previous page







1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the RED TAH-t Cannula to the RED Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.
2. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the BLUE TAH-t Cannula to the BLUE Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

CAUTION: Before disconnecting the Drive lines of the primary Freedom Driver, you must have the Drive lines of the backup Freedom Driver within reach. The backup Driver must be turned on. Perform steps 3 and 4 simultaneously.

3. Disconnect the RED Cannula from the RED Drive line of the primary Freedom Driver:
   - Press and hold down the metal release button. Pull the RED Cannula away from the RED Drive line.
   - Immediately insert the RED Cannula into the new RED Drive line from the backup Freedom Drive Insert until a click is heard and lightly tug on the connection to make sure that it is secure.
4. Simultaneously disconnect the BLUE Cannula from the BLUE Drive line of the primary Freedom Driver:
   - Press and hold down the metal release button. Pull the BLUE Cannula away from the BLUE Drive line.
   - Immediately insert the BLUE Cannula into the new BLUE Drive line from the backup Freedom Driver.
   - Insert until a click is heard and lightly tug on the connection to make sure that it is secure.
5. Slide a Wire Tie under the metal release button of each CPC connector. Create a loose loop in the tie, taking care not to depress and disconnect the connectors. Cut off the excess length of both Wire Ties.
6. Patient must notify Hospital Contact Person of the switch.
7. The Hospital should notify SynCardia Systems that the Driver has been switched and return the faulty Driver.

DuraHeart™ System®

1. **Can I do external CPR?**
   - Only if necessary; treat per physician discretion.
   - Closed chest CPR is contraindicated
   - May be performed as needed at the discretion of the attending physician
   - External chest compressions may cause the dislocation/damage of pump Inflow/Outflow conduits
   - External defibrillation any be performed on a patient with the DuraHeart™ System® without disconnecting any of the system components

2. **If not, is there a "hand pump" or external device to use?**
   No.

3. **If the device slows down (low flow state), what alarms will go off?**
   An emergency alarm will sound and the emergency alarm indicator (RED LIGHT) will light up.

4. **How can I speed up the rate of the device?**
   The rate of the device can only be modified in a hospital setting. For low flow rates, check for hypovolemia or RHF and treat accordingly.

5. **Do I need to heparinize the patient if it slows down?**
   Call the accepting VAD facility for guidance.

6. **Can the patient be defibrillated while connected to the device?**
   Yes.

7. **If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?**
   No, defibrillate per protocol.

8. **Does the patient have a pulse with this device?**
   If the patient's own heart has some residual function, you may be able to feel a pulse.

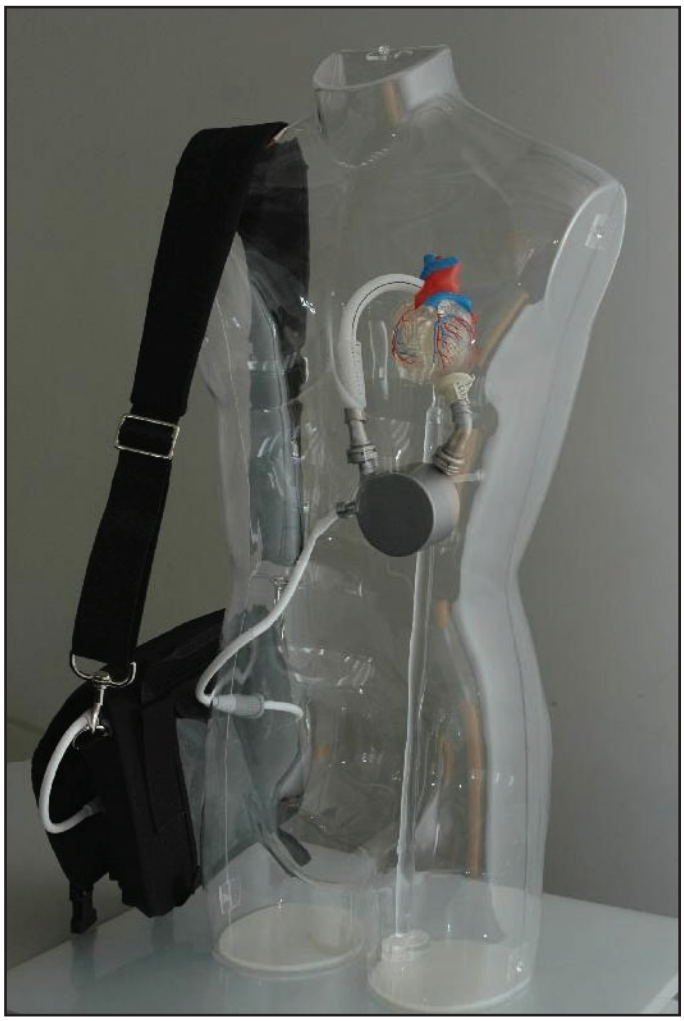
9. **What are acceptable vital sign parameters?**
   Mean Arterial Pressure (MAP) 80-90 mm Hg.

10. **Can this patient be externally paced?**
    Yes, as needed.

JANUARY 2014

DuraHeart™ System®

The DuraHeart™ LVAS is the latest-generation rotary blood pump designed for long-term patient support. The system incorporates a centrifugal flow rotary pump with an active magnetically levitated impeller featuring three position sensors and magnetic coils that optimize blood flow. The impeller's magnetic levitation is designed to eliminate friction by allowing a wide gap between blood contacting surface areas, enabling blood to flow through the pump unimpeded in a smooth non-turbulent fashion.



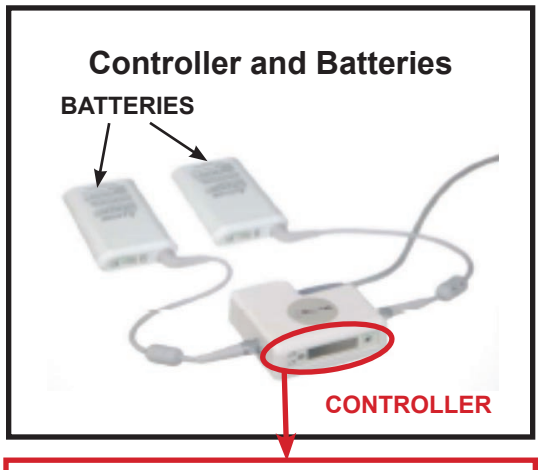
The DuraHeart™ System consists of an implantable Pump and several components that support the function of the Pump. The system is made up of seven main components (see photo below) which include:

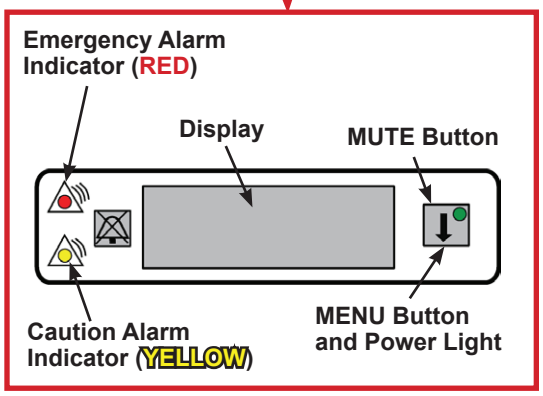
External Batteries
Li-ion batteries provide power tot the pum for untethered operation for up to 3-1/2 hours per battery. Each battery can be recharged up to 200 times.

"Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport .ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010

DuraHeart™ System®

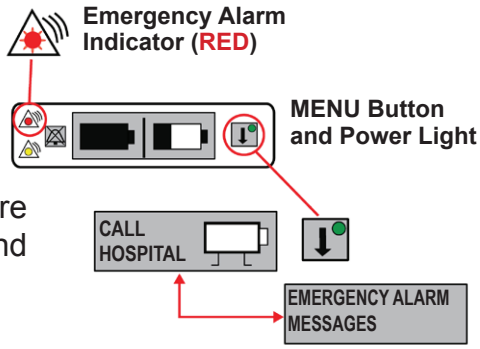
CONTROLLER





- Communicates with console for system set up, monitoring and troubleshooting
- Controls and monitors pump function, stores system data
- Interfaces with external power sources (Console, Batteries, Charger , Emergency Backup Battery)
- Displays system status – Pump Flow Rate
  – Pump Rate
  – Motor Current
  – System alarms and Alerts
  – Power Supply Status

- **Emergency Alarms**
  - High Priority.
  - Flashing **RED** light and continuous Emergency Alarm tone.
  - Requires immediate care by medical specialist and controller exchange.



EMERGENCY ALARMS

ALARM MESSAGE	PROBLEM
Replace Controller	The Pump may not be rotating
Connect Pump cable/Pump disconnected	The Pump cable is disconnected
Controller Error	Possible serious problem with the controller
Pump Failure	Pump motor may have serious problem
Mag-Failure	The impeller may not be levitated

SILENCING ALARMS

Emergency Alarms

- Mute button silences audible alarm for 2 minutes
- Audible alarm returns after 2 minutes

Caution Alerts

- Mute button silences audible alarm for 5

ANTICOAGULATION

Patients will be on Coumadin with this deviceTarget INR range should be between 2.0 to 3.0
Combination antiplatelet therapy of ASA 81mg daily and Persantine 25-75 mg TID

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JANUARY 2014

CEREBROVASCULAR PROTOCOL
CEREBROVASCULAR ACCIDENT (CVA, STROKE)
CHAPTER 24.3.13

Issued: May 10

Revised: May 12, Jul 15 Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Life Support

- Administer OXYGEN at 2-3 L/min via nasal cannula if oxygen saturation <95%
- Keep head of stretcher 30-45 degrees
- Give nothing by mouth
- Transport expeditiously

Advanced Life Support

- Full ALS Assessment and Treatment
- Obtain Vascular Access
- For hypotension (systolic BP <90 mmHg) not improved by fluid boluses or when fluid boluses are contraindicated*
- Refer to **Hypotension Protocol**
- Check blood glucose level (BGL)
  - Administer Dextrose 10% solution in an adult starting dose is 100ml IV x 1. May be repeated in 10 minutes if blood glucose level remains <60 mg/dl.
  - Document amount of D10 administered in milliliters.
  - If unable to establish vascular access, administer Glucagon, 1 mg IM or IN
  - D10may be repeated in ten minutes if blood sugar remains < 60.
- Complete Stroke Alert Checklist
- If all of the following criteria are met initiate Stroke Alert:

- The patient has no evidence of trauma
- The stroke symptoms are new and onset less than or equal to 8 hours (this is inclusive of patients who awoke with symptoms as long as they still fall within 8hr window from last time seen normal)
- Initial Glucose is greater than 50
- If patient currently has an abnormal stroke assessment as listed below

- **If patient meets stroke alert criteria immediately notify the appropriate receiving facility**
  - When patients present 0-3.5 hours from onset of symptoms they can be transported to the closest stroke center (NFR or Shands)
  - When patients present 3.5-8hours from onset of symptoms they should be transported to Shands
- Obtain a good history from the family or witnesses as to onset of symptoms. Be specific.
- Obtain name and contact number of witnesses if they do not accompany the patient to the hospital.
- Do not treat elevated blood pressure without consultation with MCP control, as this may be a compensatory mechanism for maintaining cerebral perfusion pressure.
- If seizure activity, refer to seizure protocol
- If patient is intubated, ventilate to CO2 level of 30 mmHg monitored by electronic ETCO2 capnography.

REMEMBER: Even though the patient meets tPa exclusion criteria(taking ASA, Coumadin, past CVA, etc.), he/she is still considered a STROKE ALERT patient if assessment is positive.

STROKE ASSESSMENT

Facial Droop: Have patient show teeth or smile **Normal** both sides of face move equally **Abnormal** one side of face does not move as well **Arm Drift:** Patient closes eyes and holds arms outright for 10 seconds

Normal both arms move the same **or** both arms do not move at all **Abnormal** one arm does not move **or** one arm drifts down compared with other **Abnormal Speech:** Have the patient say the words: "**You can't teach an old dog new tricks**" **Normal** patient uses correct words with no slurring

Abnormal patient slurs words, uses the wrong words, or is unable to speak

CARDIOVASCULAR PROTOCOL DYSRHYTHMIAS-VENTRICULAR FIBRILLATION PULSELESS VENTRICULAR TACHYCARDIA

CHAPTER 24.3.12

Issued: May 2010

Revised: June 11, Feb 14 Submitted By: Technical Services Approved By: Medical Director

Protocol

- Advanced Life Support
  - Follow Cardiac Arrest Management protocol
  - Assure **CPR** is initiated and performed effectively
- Assess the rhythm, if shockable, Defibrillate at 200J biphasic
  - **Peds: see Broselow tape**
  - CPR should be continued through the charging of the Defibrillator
- Continue CPR immediately after shock (do not stop to check pulse or rhythm)
- Analyze rhythm after 2 minutes of good CPR
  - If VF/VT persists: then **Defibrillate at 200J biphasic**
- Continue CPR immediately after shock (do not stop to check pulse or rhythm)
  - **Epinephrine** 1 mg IV/IO every 3-5 min during arrest
    - May replace 1st or 2nd dose of Epi with 40 units **Vasopressin IVP**.
- Analyze rhythm after 2 minutes of good CPR
  - If VF/VT persists: **Defibrillate at 200 J biphasic**
- Continue CPR immediately after shock (do not stop to check pulse or rhythm)
  - Administer **Amiodarone** 300 mg IV/IO bolus

If Amiodarone unavailable or patient has Amiodarone allergy

  - **Lidocaine** 1-1.5 mg/kg up to 3 mg/kg IVP is an acceptable alternative if amiodarone is not available.
  - (The use of Lidocaine and Amindarone in the same patient is contraindicated)
- For persistent VF/VT administer
  - **Amiodarone** 150 mg IV/IO bolus
- **Defibrillate for persistent VF/VT at 200J biphasic**
- A shock should be delivered about once every 2 minutes if the patient remains in Ventricular Fibrillation.
- Continue cycle of
  - CPR and Drug**?**Rhythm Check**?**CPR**?**Shock**?**
  - CPR and Drug**?**Rhythm Check**?**CPR**?**Shock as needed
- When dysrhythmia resolves, initiate **Amiodarone or Lidocaine** infusion
  - unless contraindicated (i.e.: allergies, bradycardia, etc.).
- **Antidysrthymic Infusions**
  - **Amiodarone** Infusion
    - Administer Amiodarone 150 mg over 10-15 minutes**.** 150 mg in 50 ml NS using a

MACRO drip infusion set run at no more than 1 drop/second
- **Lidocaine** Infusion
  - Use premixed bag that yields 4mg/1ml
    - **OR** mix 200mg (2-100mg prefilled vials) into 50ml bag of NS (4mg/ml)
  - Start rate at 2 mg/min using micro drip

- Additional interventions to consider in special circumstances

  - **Magnesium Sulfate** 2-4 gm IV/IO push over 1-2 minutes only if suspected Polymorphous VT (torsades de pointes) or hypomagnesemic state (chronic alcohol, diuretic use)
  - **Sodium bicarbonate** 1 mEq/kg IV/IO if suspected Hyperkalemia (e.g. dialysis patient) or Tricyclic antidepressant OD

CARDIOVASCULAR PROTOCOL
SynCardia Device

CHAPTER 24.3.15

Issued: March 2014 Revised: Jul 15

Submitted By: EMS Branch Approved By: Medical Director

This protocol applies to the management of all patients who have a Syncardia device implanted. The SynCardia device is a total artificial heart pump that is used to completely support heart function and blood flow in people who have nonfunctional hearts. The SynCardia device is temporary and is used as a bridge for patients awaiting heart transplants.

Basic Life Support

- Establish patent airway
- Supplemental oxygen if any respiratory signs or symptoms are present
- In a functioning device you will hear a continuous whirling sound upon first approaching the patient.
- Locate the device usually found at the patient's waist
- Record and monitor vital signs.

Note* In a majority of these patients a pulse will be palpable. A pulse rate and oxygen saturation will register if patient is attached to pulse oximetry. Do not attach a cardiac monitor, these patients do not have any meaningful electrical activity.

A manual blood pressure will be obtainable and with an automated cuff you will also be able to obtain a pressure.

If the patient is unconscious, unresponsive to stimuli, and pulseless, **DO NOT PERFORM CPR**. The SynCardia device has been surgically placed and CPR could dislodge this device, causing further damage to the tissue.

- Record blood glucose level if any weakness, altered mental status or history of diabetes.
- Nothing by mouth, unless patient is known diabetic with hypoglycemia and is able to self-administer oral glucose paste, or a glucose containing beverage.
- If found to be hypoglycemic please refer to hypoglycemia protocol
- Above all else please remember that these patients, along with their families, have been well trained in the care of themselves and their devices. LISTEN TO THEM!
- The caretaker may have already placed the patient on the backup device. It will be necessary to also bring the main SynCardia device that has likely malfunctioned with the patient.
- Patients always carry a "backup bag" which contains 2 extra fully charged batteries, and a second controller. Please make sure to always bring this emergency backup equipment with them to the hospital

Advanced Life Support

If advanced airway/ventilation management is needed, perform these interventions:

- Record and monitor continuous O2 saturation. In addition you may utilize End Tidal Co2

capnography.
- IV or IO access should be obtained if the patient is unstable
- Do not delay transport to obtain intravenous access
- If patient suffering from severe nausea or vomiting, follow Protocol 24.4.11.
- Upon arrival a **SynCardia ALERT** (Adult or Pediatric) will be initiated every time this patient call 911
- Transport patient to UF Health Emergency Department
- If pediatric (<18), transport to UF Health Pediatric Emergency Department in the north tower
- Minimize on scene time as much as possible

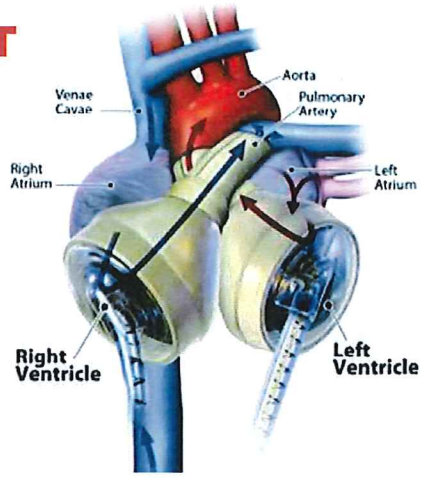
NOTE: PATIENTS ON THE SYNCARDIA DEVICE ARE LOAD AND GO SITUATIONS

Transport these patients to the closest SynCardia center. Bring the significant other or caretaker if possible to act as an expert on the device, especially if the patient is unconscious or unreliable.

Please refer to the Syncardia EMS guide located in the appendix for further information on field care of these devices. VAD Guide

Total Artificial Heart Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART
(not a left ventricular assist device-LVAD)



1. **Can I do external CPR?**
   No. Will need to rapidly exchange to the backup driver.
2. **Is there a "hand pump" or external backup device to use?**
   No.
3. **Can I give vasopressive IV drugs like epinephrine, dopamine or dobutimine?**
   Never give vasopressive drugs, especially epinephrine. These patients primarily have sysmptomatic hypertension and rarely have symptoms of hypotension. Most IV vasopressive drugs can be fatal to a TAH (Total Artificial Heart) patient.
4. **Can I speed up the rate of the device?**
   No. The device has a fixed rate between 120-140-BPM.
5. **What is the primary emergency intervention for a TAH (Total Artificial Heart)?**
   Nitroglycerin sublingual for symptomatic hypertension.
6. **Can the patient be defibrillated or externally paced while connected to the device?**
   No. There is no heart.
7. **What if the patient is symptomatic and the Freedom Driver is alarming with a continuous alarm and the red light ?**
   If the pump has failed or a line is disconnected or kinked, the patient may pass out within 30 seconds. Even when alarming, the device should continue to pump. When in doubt, immediately change out he Freedom™ Driver immediately. Then quickly check for loose or kinked connections.
8. **Does the patient have a pulse with this device?**
   Yes. The device produces Pulsatile flow. The device is pneumatically driven and is normally loud.
9. **What are acceptable vital sign parameters?**
   The BP will vary. Normal range 100-130 systolic and 60-90 diastolic.
10. **What kind of Cardiac rhythm should be displayed?**
    Asystole.

"Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport .ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010"

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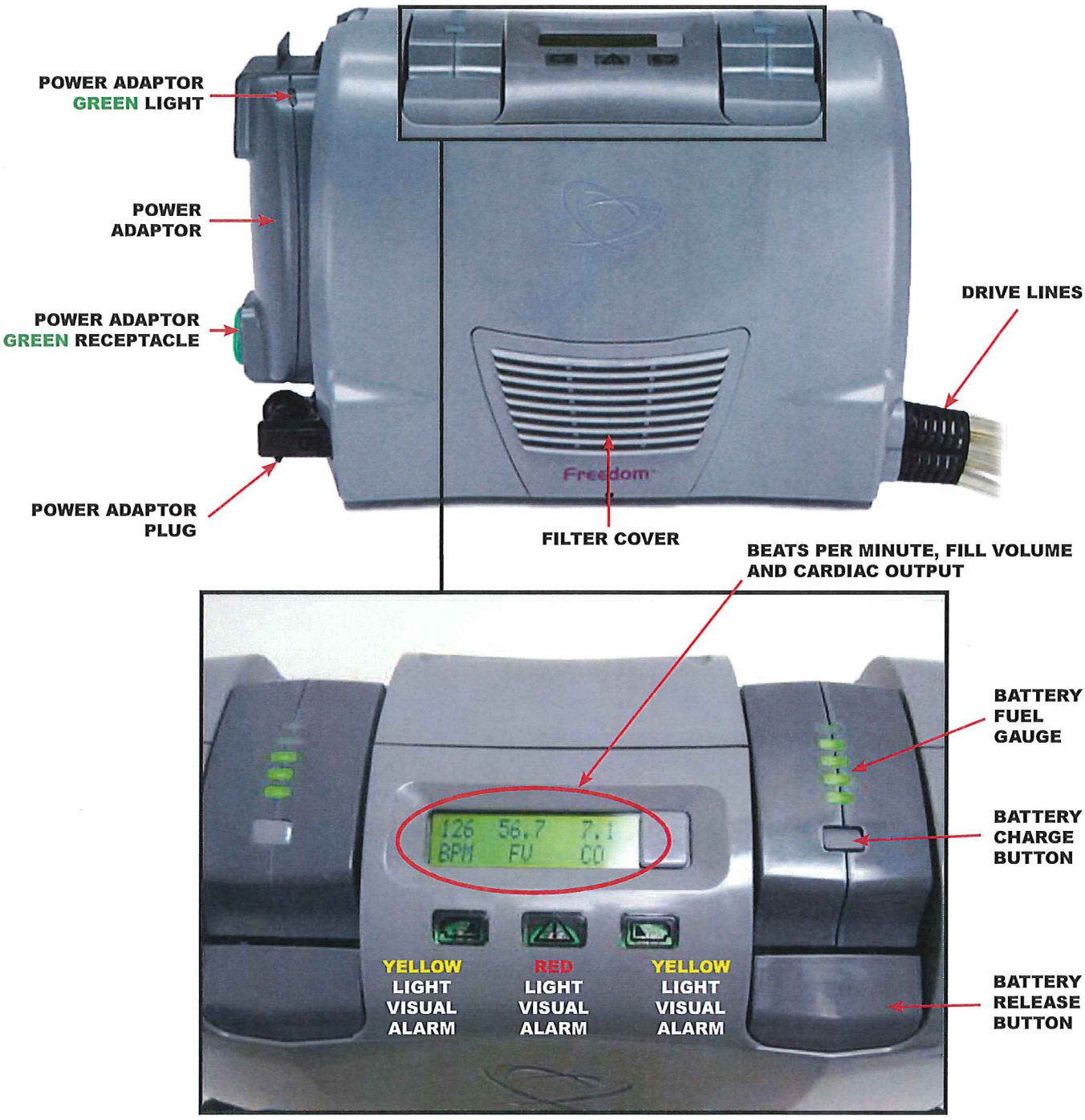
Trouble Shooting Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART

(not a left ventricular assist device -LVAD)



Freedom™ Driver System

IN THE EVENT OF AN EMERGENCY

Immediately notify VAD coordinator listed on the medical alert bracelet or tag attached to the console - please identify the device as a total artificial heart.

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JANUARY 2014

HOW TO RESPOND TO FREEDOM™ DRIVER ALARMS

There is no way to mute an Alarm.

ALARM	HEAR	SEE	MEANING	WHAT YOU SHOULD DO
Battery Alarm	Loud Intermittent Tone	Yellow Battery LED Flashing	One or both of the Onboard Batteries have less than 35% remaining charge (only two green lights display on the Battery Fuel Gauge).	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power (NOTE: Once the batteries are charged above 35% the Battery Alarm will stop) .
			Onboard Battery is incorrectly installed.	Reinsert Onboard Battery until locked in place. If Battery Alarm continues, insert a new Onboard Battery.
			One Onboard Battery missing.	Insert charged Onboard Battery into Freedom™ Driver until locked in place.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The temperature of the Driver is too hot or too cold.	Remove any objects that are blocking the Filter Cover and/or Fan and check the filter.
			The internal temperature of the Driver is too hot.	Move the Freedom Driver to a cooler or warmer area.
Fault Alarm	Loud Continuous Tone	Red Alarm LED Solid	Valsalva Maneuver: Strenuous coughing or laughing, vomiting, straining during a bowel movement, or lifting a heavy weight.	Relax/interrupt Valsalva Maneuver.
			Kinked or disconnected drive lines.	Straighten or connect drive lines.
			Driver is connected to External Power without at least one correctly inserted Onboard Battery.	Insert a charged Onboard Battery into the Freedom™ Driver until locked into place.
			One or both of the Onboard Batteries have less than 30% remaining charge.	Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power. (NOTE: the Fault Alarm will continue and will change into a Battery Alarm as the Onboard Batteries recharge. Once the Onboard Batteries are charged above 35%, the Battery Alarm will stop.)
			Malfunction of the Driver	If the steps above do not stop the Fault Alarm, switch to Backup Freedom Driver. Return to implant hospital.
Temperature Alarm	Loud Intermittent Tone	Red Alarm LED Flashing	The internal temperature of the Driver is too hot.	Remove any objects that are blocking the Filter Cover and / or Fan and check filter.
			The temperature of the Onboard Batteries is too hot or too cold.	Move the Freedom Driver to a cooler or warmer area.

You must immediately address the issue that caused the Alarm.

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JANUARY 2014

Switching from Primary to Backup Freedom™ Driver

CAUTION: It is recommended to have TWO people exchange the primary Freedom Driver for the backup Freedom Driver. Make sure all items and accessories are closely available before attempting to exchange Drivers.

Setting up the Backup Freedom™ Driver

1. Remove the drive line caps from the ends of the Drive lines.
2. Insert one charged Onboard Battery. The driver will immediately start pumping. (*Figure 1*)
3. Remove the Orange Dummy Battery. (*Figure 1*)
4. Insert the second charged Onboard Battery. (*Figure 2*)
5. If possible, connect the backup Driver into a wall power outlet.
6. Your Freedom™ Driver is now ready to connec to the patient.

FIGURE 1

FIGURE 2

BEATS PER MINUTE, FILL VOLUME AND CARDIAC OUTPUT

FIGURE 3

Continued on next page.

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Switching from Primary to Backup Freedom™ Driver

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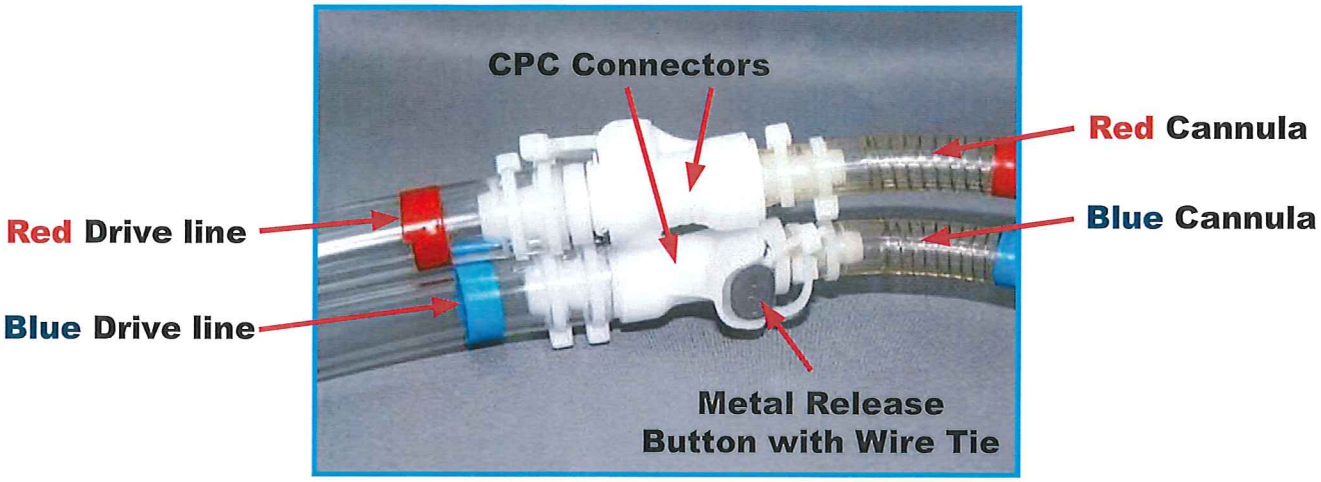
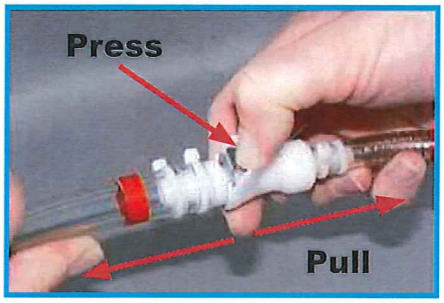
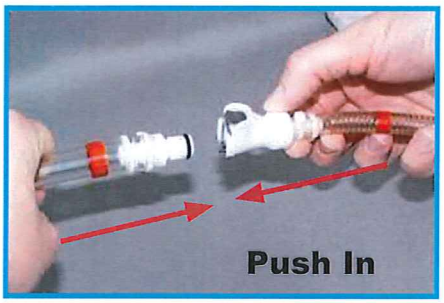






1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the RED TAH-t Cannula to the RED Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.
2. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the BLUE TAH-t Cannula to the BLUE Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

CAUTION: Before disconnecting the Drive lines of the primary Freedom Driver, you must have the Drive lines of the backup Freedom Driver within reach. The backup Driver must be turned on. Perform steps 3 and 4 simultaneously.

3. Disconnect the RED Cannula from the RED Drive line of the primary Freedom Driver:
   - Press and hold down the metal release button. Pull the RED Cannula away from the RED Drive line.
   - Immediately insert the RED Cannula into the new RED Drive line from the backup Freedom Drive Insert until a click is heard and lightly tug on the connection to make sure that it is secure.
4. Simultaneously disconnect the BLUE Cannula from the BLUE Drive line of the primary Freedom Driver:
   - Press and hold down the metal release button. Pull the BLUE Cannula away from the BLUE Drive line.
   - Immediately insert the BLUE Cannula into the new BLUE Drive line from the backup Freedom Driver.
   - Insert until a click is heard and lightly tug on the connection to make sure that it is secure.
5. Slide a Wire Tie under the metal release button of each CPC connector. Create a loose loop in the tie, taking care not to depress and disconnect the connectors. Cut off the excess length of both Wire Ties.
6. Patient must notify Hospital Contact Person of the switch.
7. The Hospital should notify SynCardia Systems that the Driver has been switched and return the faulty Driver.

MEDICAL EMERGENCY PROTOCOL
ALLERGIC REACTIONS-ANAPHYLAXIS
CHAPTER 24.4.1

Issued: May 2010

Revised: June 11, Aug 11 Submitted By: Technical Services Approved By: Medical Director

Protocol
- Basic Medical Care
- Airway management
- Vascular Access

- If simple allergic reaction (urticaria):
  - Place and transport patient in position of comfort

- If allergic reaction with itching, swelling and urticaria:
  - Administer **Diphenhydramine** 25-50 mg IVP/IM (Peds: 1 mg/kg IVP)

Or Phenergan 12.5 mg diluted in 10ml of Normal Saline slow IV/IO or 25mg IM

  - Consider Methylprednisolone 125 mg IVP (Peds: 1 mg/kg IVP)

- If anaphylaxis without hypotension (shortness of breath, wheezing, urticaria):
  - Administer **Epinephrine** 0.3 ml of 1:1,000 IM in the anterolateral thigh**
  - Administer **Diphenhydramine** 25-50 mg IVP/IM (Peds: 1 mg/kg IVP)

Or

  - **Phenergan** 12.5 mg diluted in 10ml of Normal Saline slow IV/IO or 25mg IM

  - Consider **Methylprednisolone** 125 mg IVP (Peds: 1 mg/kg IVP)
  - If wheezing, administer **Albuterol 2.5 - 5 mg via nebulizer**

- If anaphylaxis with hypotension:
  - Administer **Normal Saline bolus** of 20 ml/kg to maintain systolic BP greater than 90 mmhg. Adults may require volumes in excess of 2-3 liters
  - Administer **Epinephrine** 1:10,000-0.5 - 1mg IVP/IO
  - If wheezing, administer **Albuterol** 2.5 - 5 mg via nebulizer and repeat PRN
  - If hypotension **persists**, administer **Epinephrine** 1:10,000-1 mg IVP q3-5 mins
  - Administer **Diphenhydramine** 25-50 mg IVP/IM (Peds: 1 mg/kg IVP)

Or

  - **Phenergan** 12.5 mg diluted in 10ml of Normal Saline slow IV/IO or 25mg IM

Antihistamines and corticosteroids are second line agents for the treatment of anaphylactic shock**.** Antihistamines should be administered after the airway is secured and hypotension is resolved

** If the thigh cannot be rapidly accessed, administer epinephrine into the deltoid. Do not administer into the subcutaneous area as we have in the past- absorption may be significantly delayed in shock.

MEDICAL CONTROL OPTIONS

- Repeat any of the above Standing Orders
- Consider administration of one of the following infusions. Titrate the infusion to maintain a systolic BP greater than 90 mmHg

    - Dopamine infusion - 400 mg in 250ml. Normal Saline

OR

    - Epinephrine infusion - 1 mg in 250ml Normal Saline

- *__Precaution__: Epinephrine is relatively contraindicated in patients with known coronary artery disease, angina, or previous MI except in life-threatening circumstances.
- **__Promethazine__: Unless patients are allergic to diphenhydramine, avoid Promethazine in pediatric patients. Promethazine is not recommended for patients less than 16 years of age.

MEDICAL EMERGENCY PROTOCOL
ABDOMINAL PAIN

CHAPTER 24.4.2

Issued: May 2010

Revised: April 2012 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Basic Medical Care
Vascular Access
Use a large bore IV
Special assessment considerations:

- Assess the patient closely for possible cardiac etiology, as many patients may present with abdominal pain during an acute M.I. This should include a 12 lead ECG if available. Pay close attention to diabetics and the elderly
- Assess for orthostatic blood pressure changes.

Life threatening problems that may present with abdominal pain include:

- Acute Myocardial Infarction (AMI)
- Perforated abdominal organs
- G.I. bleeding (ask about blood in stool or emesis)
- Diabetic Ketoacidosis (DKA)
- Ruptured Appendicitis
- Dissecting Abdominal Aortic Aneurysm
- Ectopic Pregnancy (ask about menstrual history)
- Certain toxic ingestions (including mushrooms and poisons)
- Abdominal pain emergencies are likely to lead to death through hypovolemic shock (either blood or fluid loss). This may also lead to electrolyte imbalances that can cause dysrhythmias.

If patient presents in **Shock** refer to Shock protocol**.**

- Patient should have nothing to eat or drink.
- Consider **Toradol** 30mg IVP for pain management
- If patient is pregnant, history of renal dysfunction, or concerns for internal bleeding withhold administration of Toradol

If patient presents with severe nausea and vomiting:

- May administer Zofran 4mg iv or po,
- If symptoms continue at 10 min repeat 4mg iv or po x 1

OR

- May administer Phenergan 12.5 mg diluted in 10ml of Normal Saline **slow** IV/IO (if patient is 16 years or older)
- Transport patient in position of comfort if not in shock

MEDICAL EMERGENCY PROTOCOL
ALTERED MENTAL STATUS
CHAPTER 24.4.3

Issued: May 10

Revised: May 13, Jul 15 Submitted By: EMS Branch Approved By: Medical Director

(SYNCOPE/NEAR SYNCOPE)

Protocol

Basic Medical Care
Airway management
Vascular Access
Spinal immobilization if history is unknown or trauma is suspected
Check **Blood Glucose Level (BGL)**

- If blood glucose level **less than 60** mg/dl
- Administer Dextrose 10% solution in an adult, starting dose is 100 ml IV x1. May be repeated in 10 minutes if blood glucose level remains <60 mg/dl.
- Pediatric dosing is Dextrose 10% solution 5ml/kg with a maximum single dose of 100 ml.
- Document amount of D10 administered in milliliters.
- If unable to establish vascular access, administer Glucagon, 1 mg IM OR IN
- D10may be repeated in ten minutes if blood sugar remains < 60

If a change in Level Of Consciousness is suspected from **narcotic use**: (respiratory rate less than 12, pinpoint pupils, history of opiate use/abuse, etc)

- Administer **Narcan** 0.4 mg IV/IN
- If no effect, may administer **Narcan** 2 mg IV/IN
- If patient returns to baseline after **Narcan**, further boluses may be necessary
- Be prepared for a combative patient if reversal of opiate abuse (e.g. heroin addict)
- Be prepared for acute narcotic withdrawal syndrome if patient opiate dependent (as this may precipitate seizures or delirium)

Assess patient for **seizure** history and medications

Look for **underlying causes** (e.g. fever, cardiac, stroke, infections, etc.)

If patient presents with **hypotension**

- Refer to hypotension protocol

MEDICAL EMERGENCY PROTOCOL
CARBON MONOXIDE INTOXICATION

CHAPTER 24.4.4

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Medical Care

Airway management
- Give **100% OXYGEN** via NRBM irrespective of **SaO2**

Vascular Access

If Unconscious
- Altered Mental Status Protocol

Minimize patient motion

Transport to hyperbaric facility
- Shands Hospital at the University of Florida
- Baptist Hospital Jacksonville

Consider:

CPAP at 5 cm/H2O

Note: Remember that patients may not experience severe respiratory distress with this disorder. Use CPAP Prophylactic, for patients that have been exposed to carbon monoxide and show signs and symptoms of intoxication (headache, errythemia, slow capillary refill, shortness of breath)

MEDICAL EMERGENCY PROTOCOL
DIABETIC EMERGENCIES

CHAPTER 24.4.5

Issued: May 10

Revised: June 11, Aug 11, May 13
Jul 15 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Basic Medical Care

Airway management

Assess Blood Glucose Level (BGL)

If BGL is between 60-80 mg/dl and patient is verbally responsive
- May administer oral glucose 1 tube.

If BGL <60 mg/dl or patient is unresponsive or there is strong suspicion of hypoglycemia despite glucometer readings:
- Vascular Access
- Administer Dextrose 10% solution in an adult starting dose is 100ml IV x 1. May be repeated in 10 minutes if blood glucose level remains <60 mg/dl.
- Pediatric dosing is dextrose 10% solution 5ml/kg with a maximum single dose of 100 ml.

If vascular access is not available;
- Administer Glucagon 1mg IM, (Preferably in the anterolateral thigh) or IN

If suspected hyperglycemia (BGL greater than 400 mg/dl)
- Vascular Access
- Administer **Normal Saline** - fluid bolus (20ml/Kg) and then decrease rate to KVO.
- Monitor closely for fluid overload
- Recheck BGL intermittently

NOTE:
- If diabetic patient with nausea, diaphoresis, pallor or unspecified pain consider cardiac in origin and refer to the Chest Pain/Cardiac protocol.
- After treatment with Glucose/Glucagon, the paramedic should investigate the cause of the hypoglycemic episode. This might suggest an underlying medical problem and a need for transport.
- Once the patient has returned to baseline mental status, is not on oral diabetic medications, and is deemed competent with no underlying medical problem, the patient may refuse further

treatment and/or transport (without Medical Control Physician contact). It is advised for patient to be left in the company of another competent adult. If patient admits to usage of oral diabetic medications (metformin/glucophage, glyburide, glipizide, glimepiride/amaryl, pioglitazone or rosiglitazone) and they still refuse transport call medical control to further attempt to change their decision.

MEDICAL EMERGENCY PROTOCOL
DYSBARISM-DIVING ACCIDENTS

CHAPTER 24.4.6

Issued: May 2010

Revised: June 11, Aug 11 Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Medical Care
Airway management
Vascular Access
Obtain C-spine control if mechanism of injury suggests C-spine injury or if patient is unresponsive

Administer 100% **OXYGEN** by NRBM

- **Caution** should be taken with any positive pressure (BVM, intubation) as this may worsen a pneumothorax.

Transport in **left lateral** position

- Keep patient warm

Transport to the closest appropriate facility ED.

Monitor for possible/developing tension pneumothorax.

Medical Control Options:

- **Morphine Sulfate 1-5 mg IVP/IO**

MEDICAL EMERGENCY PROTOCOL
GASTROINTESTINAL BLEEDING
CHAPTER 24.4.7

Issued: May 2010

Revised: April 2012 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Basic Medical Care

Airway management
- Monitor airway for emesis

Vascular Access
- 2 large bore IV's suggested

Transport expeditiously

Refer to shock protocol

If patient is vomiting blood, may place nasogastric tube for suction of stomach contents (see appropriate protocol)

If patient presents with severe nausea and vomiting:
- May administer Zofran 4mg iv or po,
- If symptoms continue at 10 min repeat 4mg iv or po x 1

OR

- May administer Phenergan 12.5 mg diluted in 10ml of Normal Saline **slow** IV/IO (if patient is 16 years or older)
- Monitor for hypotension

MEDICAL EMERGENCY PROTOCOL
HEAT ILLNESS
CHAPTER 24.4.8

Issued: May 2010

Revised: May 15 Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Medical Care

Airway management

Evacuate patient from heat environment

Determine if patient suffers from elevated temp, heat cramps, heat exhaustion, or heat stroke.

If elevated temp:

? May sponge patient with room temperature water or Normal Saline

- **If heat cramps or heat exhaustion** (skin ambient temperature, diaphoretic):
  - Remove outer layers of clothing
  - May cool patient with water or Normal Saline
  - Vascular Access
  - Fluid bolus **Normal Saline** as needed (20ml/Kg)

? **If heat stroke** (skin hot and dry, elevated core temperature):

- Remove outer layers of clothing
- Cool patient with water, Normal Saline and/or cold packs to axilla and/or groin
- Vascular Access

- Fluid bolus **Normal Saline** as needed (20ml/Kg)
- Monitor patient closely
- Rapid Transport

NOTE: If patients are under the care of a UF Sports Medicine physician and their core temp is > 105 degrees, they will be providing a cold water bath for 15 minutes. At the end of this period, they will request a rescue for continued care and transport.

NOTE: If any other emergency medical conditions exist, EMS will remove patient from bath and take over care and transport.

MEDICAL EMERGENCY PROTOCOL
HYPERTENSION
CHAPTER 24.4.9

Issued: May 2010

Revised: May 13 Submitted By: EMS Branch Approved By: Medical Director

(Hypertensive Crisis/Urgency)

Definition: SBP ≥ 180 mm Hg, DBP ≥ 120 mm Hg Protocol

Basic Medical Care
- Assess and document severity of hypertension

- Check BP every 5 minutes.

Airway management
- Vascular Access

Asymptomatic:
- Monitor for blood pressure and symptomatic changes

Mildly symptomatic: headache, dizziness, etc., or asymptomatic with diastolic BP ≥ 120 mmHg:
- 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.

Severely symptomatic and /or hypertensive emergency (chest pain, dyspnea, pulmonary edema, mental status change, etc.) and patient's condition not improving with the above therapy:
- For a 70 Kg adult [bracketed dose is in mg/Kg ideal body weight] administer IV **Labetalol** as follows:
  - 15 mg [0.2 mg/Kg] IV push;
  - Re-check blood pressure, if goal not reached within 5 minutes...
  - 30 mg [0.4 mg/Kg] IV push;
  - Re-check blood pressure, if goal not reached within 5 minutes...
  - 60 mg [0.8 mg/Kg] IV push;
  - Re-check blood pressure, if goal not reached within 5 minutes...
  - 120 mg [1.6 mg/Kg] IV push;
  - Re-check blood pressure, if goal not reached within 5 minutes...

- May repeat 120 mg [1.6 mg/Kg] dose 2 more times;
- Observe closely for progression of symptoms. If noted, continue with protocol.
- Hypertension associated with cocaine or other drug use may be difficult to control, consider Versed 1-2 mg SIV/IO/IM/IN. May repeat once.
- In patients suspected of having a CVA/transient ischemic attack/reversible ischemic neurologic deficit, the blood pressure should **not** be treated unless directed by medical control [i.e., use less drug and/or allow the BP to remain in the high end of Goal BP], as cerebral autoregulation may be impaired.

MEDICAL EMERGENCY PROTOCOL
HYPOTHERMIA

CHAPTER 24.4.10

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Medical Care
- Assess vital signs over one minute before declaring them absent.

Airway management
Evacuate patient from cold environment. Handle the patient very gently as the hypothermic heart is irritable and ventricular arrhythmias may result from rough treatment.
Warm patient compartment

If core temperature > 95 degrees F:

- Vascular Access
- Utilize warm fluids if possible

- Administer **Normal Saline** at 250ml/hr unless otherwise indicated
- Remove wet or cold clothing; wrap patient in blankets

If core temperature < 95 degrees F:

- Obtain 12 lead if available
- Treat dysrhythmias per cardiac protocols

- **Warming is the priority**. Maintain core temperature with blankets
- If patient exhibits a decreased level of consciousness, incorporate that protocol into your treatment plan.

If hypothermia injury is local (frostbite):

- Handle injured part gently; leave uncovered.
- Do not allow the injured part to thaw if chance exists for the part to refreeze before arrival at a definitive care facility.

MEDICAL EMERGENCY PROTOCOL
NAUSEA & VOMITING

CHAPTER 24.4.11

Issued: May 2010

Revised: April 2012 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Basic Medical Care
Vascular Access
- Use a large bore IV

Special assessment considerations:
- Assess the patient closely for possible cardiac etiology, as many patients may present with sudden nausea and vomiting during an acute M.I. This should include a 12 lead ECG if available. Pay close attention to diabetics and the elderly
- Assess for orthostatic blood pressure changes.

Life threatening problems that may present with nausea and vomiting include:
- Acute Myocardial Infarction(AMI)
- G.I. bleeding (ask about blood in stool or emesis)
- Diabetic Ketoacidosis (DKA)
- Ruptured Appendicitis
- Certain toxic ingestions (including mushrooms and poisons)
- Nausea and vomiting can lead to death through hypovolemic shock (either blood or fluid loss) especially in infants and the elderly. This may also lead to electrolyte imbalances that can cause dysrhythmias.

If patient presents in Shock refer to Shock protocol.
- Patient should have nothing to eat or drink.

If patient presents with severe nausea and vomiting:
- May administer Zofran 4mg iv or po
- If symptoms continue at 10 min repeat 4mg iv or po x 1

OR

- May administer Phenergan 12.5mg diluted in 10ml of Normal Saline **slow** IV/IO (if patient is 16 years or older)
- Monitor for hypotension
- Transport patient in position of comfort if not in shock

MEDICAL EMERGENCY PROTOCOL
OVERDOSE & POISON INGESTION

CHAPTER 24.4.12

Issued: May 2010

Revised: June 11, Aug 11, Sept 11
May 13

Submitted By: EMS Branch Approved By: Medical Director

Protocol

- Basic Medical Care
- Airway management
- Determine agent, time and amount of ingestion, circumstances of the event, and retain for transport any pill bottles, containers, or other identifying material
  - Notify CCC to contact Poison Control and to advise of your destination hospital
- Vascular Access
- For hypotension (systolic BP < 90 mmHg) not improved by fluid boluses, or when fluid boluses are contraindicated:
  - Dopamine infusion at 10-20 mcg/kg/min titrated to maintain systolic BP > 90 mm Hg
  - If wide QRS complex (=0.10sec), hypotension, or any arrhythmias:
  - Sodium Bicarbonate 1 mEq/kg IV, Repeat Sodium Bicarbonate 1 mEq/kg IV in 5 to 10 minutes
    - If any of the following conditions occur, refer to the appropriate protocols:
      - Polymorphous Ventricular Tachycardia
      - Altered mental status
      - Seizures
- **If patient awake, alert:**
  - Transport patient
- **If patient with decreased level of consciousness:**
  - Perform blood glucose check
  - Refer to altered mental status protocol
- **Several ingestions may have antidotes or effective countermeasures. Consult with Medical Control if you have any questions and concerns.**

- Tricyclic Antidepressants:
  - Cardiotoxicity may manifest as tachycardia, wide QRS, or hypotension;
  - Alkalization may be accomplished with hyperventilation and/or administration of **Sodium Bicarb** 50-100 mEq IVP, and an infusion of **Sodium Bicarb** 100 mEq in **Normal Saline** 1000 ml TRA 150 ml/hour.
- Cholinergic Poisoning (organophosphate or carbamate insecticides):
  - Toxicity to crew may result from inhalation or topical exposure. Any patient with dermal exposure **MUST** be adequately decontaminated prior to transport. Crew should wear protective clothing including masks, gloves, and eye protection;
  - Initiate Hazmat alert if indicated
  - Remove all patients clothing and contain run off toxic chemicals when flushing
  - Use supplemental O2
  - If symptoms severe (blurred vision, nausea, vomiting, diarrhea, salivation, lacrimation, bradycardia, diaphoresis, wheezing, fasciculations, confusion, and seizures, etc):
    - Administer **Atropine** 2 mg IVP every 5 minutes titrate dosing by assessing improvement in respiratory/bronchial secretions.
    - For hypotension (systolic bp<90mmHg) not improving by fluid boluses or when contraindicated use Dopamine 10-20mcg/kg/min titrate to maintain sbp >90mmHg.
- Acetaminophen:
  - If patient has a known toxic acetaminophen level or ingestion of potential toxic dose (calculated greater than 140 mg/Kg or 7.5 gm), transport to receiving facility expeditiously.
- Digoxin (symptomatic):
  - Administer **Magnesium Sulfate** 2 gm slow IVP.
- Cyanide (symptomatic):
  - Transport expeditiously
  - Administer Cyanokit 5 grams IVP
- Methanol, Ethylene Glycol:
  - Transport expeditiously
- Antipsychotics/Acute dystonic reaction: (common offenders: haloperidol, prolixin, thorazine, prochlorazine/compazine, promethazine/phenergan
  - Administer **Diphenhydramine** 50 mg IVP.
- Calcium Channel Blockers:(examples: amlodipine/norvasc, nifedipine/procardia/adalat, felodipine/pendil/renedil, verapamil/calan, isradipine/dynacirc/, diltiazem/cardizem, nicardipine/cardene)
  - Toxicity may manifest as bradycardia, hypotension, bronchospasm, and/or altered mental status;
  - For those patients with cardiovascular toxicity, (defined by: sbp< 90mmHg altered mental status and bradycardia) administer the following:
    - Atropine 0.5mg IV repeat every 3 min as needed with a max of 3mg

- If no response administer **Calcium Chloride 10%** solution 1gm IV slow (adults only, contraindicated with digoxin use), this can be repeated x1
- If no response Glucagon 3mg IV/IN x 1
- If no response, or patient presenting with 2nd or 3rd degree heart blocks, begin transcutaneous pacing

- Beta Blockers:(examples: propanolol, atenolol/tenormin, metoprolol/lopressor, nadolol/ corgard, timolol/blocadren, labetalol/trandate, esmolol/brevibloc)
  - Toxicity may manifest as bradycardia, hypotension, bronchospasm, and/or altered mental status;
    - For those patients with cardiovascular toxicity, defined by: sbp< 90mmHg, AMS, bradycardia, 2nd or 3rd degree heart blocks administer the following:
      - Atropine 0.5mg IV repeat every 3 min as needed with a max of 3mg
      - If no response administer **Calcium Chloride 10%** solution 1gm IV slow (adults only, contraindicated with digoxin use), this can be repeated x1
      - If no response glucagon 3mg IV/IN x 1
      - If no response begin transcutaneous pacing
- Benzodiazepines:
  - Support airway and transport.
- Cocaine**:**
  - Toxicity may manifest as tachycardia, hypertension, agitation, and mental status changes;
  - Administer **Versed 1-2 mg SIV/IN**. May repeat once.
- Carbon Monoxide
  - Remove patient from the contamination source
  - Supplemental 100% oxygen; document time started
  - For smoke inhalation patients consider cyanide poisoning
- Opiates**:**
  - Toxicity may manifest as altered mental status, pinpoint pupils, slow respirations, and hypotension;
    - Administer **Narcan** .
      - **ADULT** - 0.4 - 2mg IVP, IO,IM, IN, SQ, or via ETT, repeat as necessary.
      - **PED**- 0.1 mg/Kg IVP,IO,IM, IN every 2 minutes; titrate to respiratory increase or to a maximum dose of 2mg

See "Drug Overdose Chart" on next page for more information.

MEDICAL CONTROL OPTIONS

- **OPTION A:** Repeat any of the above Standing Orders

- **OPTION B:** Administer Activated Charcoal 50-100 gm P.O. or NG tube

- **OPTION C: HAZMAT** Unit: **Cyanide Ingestion**
  - Open **amyl nitrite** pearl under the nose; encourage forceful inhalation.

  - Administer **Sodium Nitrite 3%** 5-10 ml slow IVP (contact MCA for Pediatric dosing).

  - Administer **Sodium thiosulfate** 25% 50 ml slow IVP over 10-15 minutes (contact MCA for Pediatric dosing).

Click to view **?** **Drug Overdose Chart**

Drug Over Dose Chart

DRUG CLASS	CARDIOVASCULAR SIGNS OF TOXICITY	TREATMENT TO CONSIDER
Stimulants, Sympathomimetic Amphetemines Methamphetamine Cocaine Phencyclidine (PCP)	Tachycardia* Supraventricular & ventricular arrhythmias Hypertension Acute coronary syndromes Shock Cardiac arrest	Benzodiazepines Lidocaine Sodium Bicarb Propranolol & other nonselective β-blockers maybe harmful and controversial
Calcium Channel Blockers Verapamil Nifedipine Diltiazem	Bradycardia Impaired condition Shock Cardiac arrest	Mixed α-/β-agonist Pacemaker Calcium infusions Insulin euglycemia
β-Adrenergic Receptor Antagonists Propranolol Atenolol	Bradycardia Impaired condition Shock Cardiac arrest	Pacemakers Mixed α-/β agonist Glucagon, insulin Insulin euglycemia
Tricyclic Antidepressants Amitrptyline Desipramine Nortriptyline	Tachycardia Bradycardia Ventricular arrhythmias Impaired conduction Shock, cardiac arrest	Sodium Bicarb Mixed α-/β agonist or α-agonist Lidocaine
Cardiac Glycosides Digoxin Digitoxin Foxglove Oleander	Bradycardia Supraventricular / ventricular arrhythmias Impaired conduction Shock, cardiac arrest	Digoxin-specific fragments (Digibind) Magnesium Pacemaker

DRUG CLASS	CARDIOVASCULAR SIGNS OF TOXICITY	TREATMENT TO CONSIDER
Anticholinergics Diphenhydramine Doxylamine	Tachycardia Supraventricular / ventricular arrhythmias Impaired conduction Shock, Cardiac arrest	Physostigmine
Cholinergics Carbamate Nerve agents Organophosphates	Bradycardia Ventricular arrhythmias Impaired conduction, Shock Pulmonary edema, Bronchospasm Cardiac arrest	Atropine Decontamination Pralidoxime Obidoxine
Opiates Heroin Fentanyl Methadone	Hypoventilation Bradycardia, Hypotension	Naloxone Nalmefene
Isoniazid	Lactic acidosis with / with out seizures Tachycardia Bradycardia Shock, Cardiac arrest	Pyridoxide (Vitamin B6)
Sodium channel blockers Type 1A antiarrhythmics Propranolol Verapamil Tricyclic antidepressants	Impaired conduction Bradycardia Ventricular arrhythmias Seizures Shock, Cardiac arrest	Sodium Bicarb Pacemakers α-/β Agonist Lidocaine Hypertonic saline

MEDICAL EMERGENCY PROTOCOL
PSYCHIATRIC DISTURBANCES/EXCITED DELIRIUM

CHAPTER 24.4.13

Issued: May 2010

Revised: Nov 12, May 13 Submitted By: EMS Branch Approved By: Medical Director

Purpose

A psychiatric disturbance is defined by an individual who is presenting with acute mental distress or disability not associated with a medical condition.

Excited delirium is defined by any of the following: agitation, anxiety, hallucination, disorientation, violent and bizarre behavior, insensitivity to pain, elevated body temperature and super human strength. Excited delirium arises commonly in male subjects with a history of mental illness, drug abuse (particularly stimulants), alcohol withdrawal and/or head injury.

Left untreated, patients can progress to excited delirium resulting in death from cardiac/respiratory arrest, sometimes associated with the use of physical restraints or tasers.

Protocol

Basic Medical Care

- **Safety for both the EMS crew and the patient are of paramount concern. Take no actions that may endanger EMS personnel or the patient.**
- **Always involve law enforcement if the patient may present a significant danger to him/herself, bystanders, to yourself, or your partner.**
- Determine if patient is awake and alert, if possibility of traumatic injury exists, or if underlying medical problems (e.g. hypoglycemia, hypoxia, drug or alcohol intoxication), might cause patient's behavioral difficulties. Refer to appropriate protocol.
- If possible, establish collegial rapport with patient.
- Avoid escalating the situation.
- Remove all loose objects or potential weapons from the patient care area.
- It would be prudent to secure any personal equipment (scissors, etc.) at a distance from the patient.
- If patient becomes violent before transport, enlist assistance of patient's family, friends, and/or law enforcement personnel.

- EMS personnel should not transport the overly hostile patient alone.
- If patient becomes violent at any time during care and becomes a danger to him/herself or the medical team, attempt to control patient using reassurance and, if needed, mechanical restraints.
- If restraints are used the receiving facility shall be notified.
- If unable to restrain, request driver to stop vehicle immediately and notify law enforcement personnel for assistance.
- Restrain patients in supine or lateral recumbent position only, using no excessive force.
- Never allow patients to be restrained in the “hog-tied” position.
- **Versed 1-2 mg SIVP/IM OR IN** for control of agitated patient. May repeat once.
- **Haldol** 2.5 - 5 mg IV slowly, for patients exhibiting agitation. May repeat up to total dose of 10 mg.

Any patient who is psychotic or could present a danger to personnel will be transported with 2 personnel in the patient compartment.

MEDICAL EMERGENCY PROTOCOL
RESPIRATORY DISTRESS
CHAPTER 24.4.14

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Medical Care
Airway management

- Determine site of respiratory impairment
- Allow patient to sit in position of comfort

If infectious upper airway obstruction (croup or epiglottitis):

- Administer 100% **Oxygen** via NRBM or "blow-by" technique
- Attempt to calm patient; allow to sit in position of comfort
- **Parent may be allowed to hold the pediatric patient**
- Transport expeditiously
- Vascular Access, if at all, after airway control established
- If suspected epiglottitis, avoid agitation

If lower airway obstruction (Asthma, COPD, Wheezing):

***For severe respiratory distress apply CPAP (see procedural) before continuing treatment

Administer **Albuterol** 2.5-5 mg in 3ml **Normal Saline** via nebulizer
Albuterol therapy may be repeated as necessary during transport while heart rate remains below 160
Vascular Access

If patient **does not improve** or has **self-administered** albuterol prior to requesting EMS:

- Consider a mixed **Albuterol** 2.5 mg / **Atrovent** 0.5 mg treatment
- Consider Solumedrol 125 mg IVP
- If bronchospasm worsens despite treatment**, respiratory failure may be imminent** (as documented by falling oxyhemoglobin saturations, tachycardia, increased work of breathing, lethargy, apnea, etc ;).
  - Refer to Advanced Airway Protocol

Patients with chronic obstructive pulmonary disease may have a decrease in respiratory effort and/or mental status when placed on high concentrations of Oxygen. Thus, a SaO2 of 91% to 95% is acceptable.

Medical Control Options

- For Croup/ epiglottitis: If breathing becomes labored and **SaO2** consistently decreases below 90%
  - Gently assist ventilations with BVM with 100% **Oxygen**
- Administer **Epinephrine** .5 mg in 2ml **Normal Saline** via nebulizer
- **Magnesium Sulfate** 1-2 gm slow IV push over 5 minutes

MEDICAL EMERGENCY PROTOCOL
SIEZURES
CHAPTER 24.4.15

Issued: May 2010

Revised: May 13, Dec 14 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Basic Medical Care
Airway management
Immobilize if indicated
Protect patient from injuring him/herself

Vascular Access

Obtain Blood Glucose Level

For repeated seizures or seizures lasting longer than 2 minutes:

- Administer **Versed 1-2 mg SIVP**, IO or IM or IN
- Repeat dose once every 2 minutes up to 10 mg if seizure activity continues
- Be prepared to support a decreased respiratory status
- If seizure occurs in the setting of poisoning, overdose or eclampsia refer to the appropriate protocol for additional management

MEDICAL CONTROL OPTIONS:

- Consider Versed 1-2 mg IM/IO/IN if unable to obtain vascular.

NOTE: Consider contacting Medical Control in the rare chance of prolonged transport time and seizure is refractory to versed an additional consideration may be the use of lidocaine to halt seizure activity.

MEDICAL EMERGENCY PROTOCOL
SHOCK-ALS
CHAPTER 24.4.16

Issued: May 2010

Revised: May 15 Submitted By: Technical Services Approved By: Medical Director

Background:

- Hypoperfusion of body organs is characterized by alterations in mental status, pallor, tachypnea, tachycardia, poor capillary refill, hypotension (late sign). There are several different forms of shock, identifying the cause of shock helps define appropriate treatment.
- Anaphylactic Shock: Signs or symptoms of hypoperfusion from an anaphylactic reaction to an allergen. May or may not have hives and swelling. Histamines have a vasodilating effect on the system.
- Hypovolemic Shock: Signs or symptoms of hypoperfusion from suspected internal or external bleeding, or volume loss from repetitive vomiting/diarrhea, etc.
- Septic Shock: Signs or symptoms of hypoperfusion from a suspected infectious source (urosepsis, pneumonia, bacteremia, etc.). These patients may or may not present with fever or other signs of infection. Toxins have a vasodilating effect on the system.
- Cardiogenic Shock: Signs or symptoms of hypoperfusion/hypovolemia often with suspected pulmonary edema (CHF exacerbation) due to inadequate pump function.
- Neurogenic Shock: Signs or symptoms of hypoperfusion from a suspected spinal cord injury. Patient can present with normal to brady heart rate and normal skin presentation (warm, dry, pink). The damage to the cord is interrupting the impulses to release adrenaline.

Protocol

- Basic Medical Care
- Airway management
- BLS Shock Protocol
- Vascular Access
- Determine the etiology of shock
- Continually reassess

Anaphylaxis: refer to anaphylaxis protocol

Hypovolemia: (i.e. trauma, ruptured aorta, ectopic pregnancy, etc)

- If bleeding is controlled or hypovolemia is from other fluid loss (i.e. vomiting, diarrhea)
- Administer Normal Saline fluid bolus of 20 ml/Kg over 15 minutes

- Reassess lung sounds
- May repeat 20ml/Kg fluid bolus
- If the patient remains hypotensive, refractory to fluids, move onto vasopressor therapy (see **refractory hypotension below)**

Hypovolemic from uncontrolled bleeding:

- Initiate 2nd IV
- Titrate fluid administration to maintain peripheral pulses
- If the patient remains hypotensive, refractory to fluids, move onto vasopressor therapy (see **refractory hypotension below)**

Septic (sepsis): refer to sepsis protocol

Hypotension refractory to IV fluids,

- Administer Dopamine or Levophed infusion.
- Titrate to systolic BP greater than 100 mmHg
- If the patient remains hypotensive, refractory to fluids, move onto vasopressor therapy (see **refractory hypotension below)**

Cardiogenic (CHF)

- Position patient upright if tolerated
- Manage Airway and support ventilations if needed
- Administer Normal Saline fluid bolus of 100 ml
- Reassess patient
- If systolic BP improves, continue cautious fluid boluses until no further improvement noted or systolic BP 90-100 mmHg.
- If the patient remains hypotensive, refractory to fluids, move onto vasopressor therapy (see **refractory hypotension below)**

Neurogenic (spinal cord injury):

- Secure airway while maintaining cervical spine immobilization
- Administer OXYGEN irrespective of Saturation level
- Keep patient warm
- Administer fluid bolus of Normal Saline 20 ml/Kg
- If the patient remains hypotensive, refractory to fluids, move onto vasopressor therapy (see **refractory hypotension below)**

Refractory hypotension:

- If Hypotension does not improve with fluid bolus. Consider administration of one of the following infusions. Titrate infusion to maintain a systolic BP greater than90 mmHg
- Levophed infusion -by mixing 4mg in 250ml D5W or NS (16mcg/ml)
  - Adult: 0.5 – 30 mcg/min IV/IO and titrate to effective blood pressure (0.125 – 1.9ml/ min.)
  - Pediatric: 0.05 – 1 mcg/kg/min IV/IO and titrate to effective blood pressure

~~OR~~

- Dopamine infusion - 400 mg in 250ml Normal Saline
  - Dose: 10-20mcg/kg/min IV/IO and titrate to effective blood pressure

~~OR~~

- Epinephrine infusion – 2.5mg (1:1000) in a 250ml bag of NS (creates a 10mcg/ml solution) drip at 2 – 20 mcg/min. which is 0.2 – 2ml/min.

IMPORTANT:

Prior to administering Levophed, Epinephrine or Dopamine, you shall ensure that the intravenous access is clearly in place. If there is any concern for intravenous infiltration, then Levophed, Epinephrine or Dopamine should be administered via IO. If infiltration does occur or there is concern for infiltration the site must be marked with a pen and the facility must be notified on arrival. This is critical because infiltration requires immediate treatment.

If significant trauma or severe illness suspected, treat per protocol and DO NOT delay transport to obtain vascular access.

MEDICAL EMERGENCY PROTOCOL
SNAKE BITE
CHAPTER 24.4.17

Issued: May 2010

Revised: June 11, Aug 11 Submitted By: Technical Services Approved By: Medical Director

Protocol:

- Basic Medical Care
- Airway management
- Vascular Access:
  - Two IV's preferred.
- Immobilize area and minimize all movement
- Cardiac monitor
  - Treat dysrhythmias per protocol
- Assess degree of envenomation, type of snake, and advise MCP
- Outline edematous, erythremic, ecchymotic area with a pen and note the time
- Follow hypotension/anaphylaxis protocol as needed

MEDICAL CONTROL OPTIONS:

- **Morphine Sulfate** 1 - 5 mg IVP/IO for pain

MEDICAL CARE PROTOCOL
TASER REMOVAL

CHAPTER 24.4.18

Issued: November 2012 Revised:

Submitted By: EMS Branch Approved by: Medical Director

Protocol

For patients that have been controlled by law enforcement using a Taser Device. All patients should be evaluated for underlying medical, substance abuse and/or psychiatric emergencies. All patients shall either be **transported** or a **waiver obtained**.

- Confirm scene safety with LEA and approach the patient with caution.

- Most sworn Law Enforcement personnel have been trained to remove Taser Probes. Probes that have penetrated a “sensitive area” such as the head, neck, spinal column and groin or breast tissue in a female will not be removed by LEA and will require transport.

- If the probes are embedded in an area not specified above and the patient appears stable; they may be removed in the following manner:
  1. Place one hand on the patient in the area where the probe is embedded to stabilize the skin around the puncture site.
  2. Place second hand firmly around the probe.
  3. In one fluid motion, pull the probe straight out of the puncture site, if resistance is met, leave probe in place and transport.
  4. Repeat procedure on remaining probe(s).
  5. Handle probes as a bio-hazard sharp with the exception that the officer may request that the probe be turned over to him/her for entry as evidence.

Considerations

Do not delay transport if the one or more of the following exist.

- Unconscious patient

- Evidence of progressing excited delirium (Chapter 24.4.13)

- Persistent abnormal vital signs

- History/Physical findings consistent with amphetamine/hallucinogenic drug use

- Altered level of consciousness, aggressive or violent behavior
- Evidence of hyperthermia

APPARENT LIFE-THREATENING EVENT (ALTE)

CHAPTER 24.4.19

Issued: Feb 2014 Revised: Jul 15

Submitted by: EMS Branch Approved By: Medical Director

Background:

An Apparent Life-Threatening Event (ALTE) is any episode in which an infant or young child has an appearance that concerns observers that the child may be dying or at risk of death. The patient typically displays apnea, choking, change in color (cyanosis or pallor), or change in muscle tone (typically limp). Incidence peaks at 10-12 weeks old, and premature infants and children at less than 1 year old are considered high-risk.

There are many causes of ALTEs, including airway obstruction, cardiac abnormalities, hypoglycemia, sepsis, meningitis, respiratory tract infection, seizure, metabolic syndromes, and trauma (including non-accidental). Patients may have no further symptoms but still remain at high risk for sudden death, including from Sudden Infant Death Syndrome (SIDS). It is thus important to stress the need for full ED evaluation, even in well-appearing children, and be ready to provide supportive care or Pediatric Advanced Life Support (PALS) as needed.

Basic Life Support

- Initiate basic medical care.
- Establish patent airway, use jaw thrust and bag-valve-mask ventilation as needed

- Administer oxygen as needed to maintain O2 >94%.
- Record and monitor vital signs
- Obtain a SAMPLE history from parents
  - Signs and Symptoms, Allergies, Medicines, Pertinent history, Last meal, Events leading up to incident
- Check blood glucose in all patients

Advanced Life Support

- IV access or IO line as necessary
- Cardiac monitor
- Management
- Airway management
- Seizure: Versed (0.1 mg/kg IV)

  - Hypoglycemia: correct with dextrose as needed for finger stick Glucose < 60 or if symptomatic

        - D10 (5ml/kg)maximum single dose of 100 ml.
    - Infant/neonate: 5 ml/kg D10
- See Pediatric normal vitals and neonatal appendices for further management

Notes

Frequently reassess patients as they remain at risk for apnea, aspiration, seizure, and sepsis.

ALTE patients are at high risk for morbidity and mortality even if well-appearing at time of EMS contact. If parents or caregivers refuse emergency transport, explain the child remains at high risk and needs further evaluation. If they still refuse, contact medical control.

Med Control

Contact medical control for additional orders or questions.

MEDICAL EMERGENCY PROTOCOL
BASIC MEDICAL CARE PROTOCOL
PAIN MANAGEMENT
CHAPTER 24.4.20
Issued: December 2014 Revised:

Submitted By: EMS BRANCH Approved By: Medical Director

General: Pain is one of the most common reasons that patients call for emergency medical services. Emergency medicine personnel in the pre-hospital and hospital setting many times fail to appropriately control pain. There are many reasons for this failure. Pain medications have many complicating factors including: hemodynamic instability, addiction, alteration in mental status, drug reactions, their ability to mask symptoms upon arrival to the hospital, and that they are controlled substances.

Patients who should be considered for pain management include:

- Burn patients
- Trauma patients with obvious limb deformities (including concern for hip fracture in the elderly), road rash, or large lacerations
- Nephrolithiasis (renal stone)
- Severe Abdominal pain
- Acute Back Spasm

Contraindications include:

- Hypotension-sbp <90
- Altered mental status
- Respiratory distress
- Medication allergy
- Chronic pain
- Headache

Special Assessment considerations:

Part of your routine patient evaluation is asking a patient their chief complaint, history of present illness and when appropriate, their pain level. Your assessment of their pain should include their pain scale rating, their activity in your presence, physical exam and any vital sign changes. Use the pain assessment tool below to assist you in deciding their pain level. In your physical exam assess for any pain medication patches, pain with movement and pain with palpation. Typically when a patient is in severe pain you will see an elevation in blood pressure and heart rate as well.

After a full assessment if the patient's pain is

1. Acute
2. Severe, and
3. Do not meet any of the above contraindications

*Proceed with pain medication administration following the protocol provided below:

Protocol

- Basic Medical Care
- Airway management

- Vascular access
- Administer Pain medication:

- Fentanyl 25-50mcg IVP/IO/IN Q 5min PRN pain with a max of 150mcg (peds dosing 1-2mcg/kg IVP/IO/IN Q 5min PRN pain with a max of 150mcg)

- Morphine 1-5mg IVP/IO Q 10min PRN pain with a max of 15mg (peds dosing 0.1mg/kg IVP/IO Q10min PRN pain with a max of 15mg)

- Toradol 30mg IVP/IO x1 for nephrolithiasis pain

*Toradol is to be used to treat nephrolithiasis pain, the use in trauma is contraindicated due to possible internal bleeding.

Other Considerations:
Nausea is a common problem after administration of narcotic medication. When a patient has a history of nausea with pain medications or is already feeling nauseated one can consider a prophylactic dose of Zofran 4mg IV/IO x 1 (Phenergan 12.5mg IV/IO x 1 as an alternative)

*Also if nausea occurs after a narcotic has been administered then Zofran 4mg IV/IO can be given Q10min x 2 PRN nausea (Phenergan 12.5mg IV/IO x 1 as an alternative).

*Remember prior to and after administration of any drug reassess your patient, including a full set of vitals and a reassessment of their pain.

*Chest pain should be treated with the chest pain protocol.

Medical Control
For any questions or concerns call medical control. For additional pain dosages call medical control.

UNIVERSAL PAIN ASSESSMENT TOOL

UNIVERSAL PAIN ASSESSMENT TOOL

This pain assessment tool is intended to help patient care providers assess pain according to individual patient needs. Explain and use 0-10 Scale for patient self-assessment. Use the faces or behavioral observations to interpret expressed pain when patient cannot communicate his/her pain intensity.

Verbal Descriptor Scale	NO PAIN	MILD PAIN	MODERATE PAIN	MODERATE PAIN	SEVERE PAIN	WORST PAIN POSSIBLE
WONG-BAKER FACIAL GRIMACE SCALE						
	Alert Smiling	No humor serious flat	Furrowed brow pursed lips breath holding	Wrinkled nose raised upper lips rapid breathing	Slow blink open mouth	Eyes closed moaning crying
ACTIVITY TOLERANCE SCALE	NO PAIN	CAN BE IGNORED	INTERFERES WITH TASKS	INTERFERES WITH CONCENTRATION	INTERFERES WITH BASIC NEEDS	BEDREST REQUIRED

TRAUMA PROTOCOL
TRAUMA

CHAPTER 24.5.1

Issued: May 2010

**Revised: June 11, Aug 11,
Jan 13. Dec 13, Dec 14**

Submitted By: EMS Branch Approved By: Medical Director

Protocol

EARLY TRANSPORT OF THE CRITICAL TRAUMA PATIENT OFFERS THE BEST CHANCE OF SURVIVAL. FIELD TIME SHOULD NOT BE PROLONGED IN ORDER TO PERFORM PROCEDURES NOT ABSOLUTELY CRITICAL TO THE WELL-BEING OF THE PATIENT DURING TRANSPORT.

Basic Medical Care

AIRWAY

Assess airway patency

- If intact, administer OXYGEN by most appropriate method

If patency in question:

- If patient exhibits increased respiratory compromise perform jaw thrust maneuver to open the airway making sure to maintain cervical spine position and immobilization.

Reassess the respiratory effort:

- If adequate, ensure $SaO_2 \geq 95\%$

If unsuccessful, consider placement of a nasal trumpet or oral airway to maintain airway patency. The individual controlling cervical immobilization must maintain the jaw thrust maneuver until airway is placed.

Assist ventilation with 100% OXYGEN via bag-valve-mask as needed

Perform endotracheal intubation as needed

The nasal intubation can be used on the trauma victim. Contraindications to this route include:

- Apnea
- The presence of mid-face fractures
- Significant neck trauma with possible disruption of the airway
- Known bleeding disorders
- Oral intubation may be performed with assistance in maintaining neutral head position

If intubation is unsuccessful (including placement of King LTD airway) or mechanical obstruction prevents intubation and ventilating via bag valve mask, perform surgical cricothyrotomy (needle cricothyrotomy if patient is less than 12 years of age).

BREATHING

Assess respiratory exchange

If adequacy of ventilation is in question:

- Support ventilation at a rate of 12-14 breaths/minute with 100% oxygen via Bag Valve Mask
- If evidence of herniation such as decerebrate or decorticate posturing, abnormal pupil, seizure, or bradycardia, **Hyperventilate at 20-22 breaths per minute.**
- **If patient is intubated, ventilate to CO2 target of 35 - 45 mmHg** utilizing electronic ETCO2 waveform capnography
- Assess for signs of chest trauma
- **Open chest wound** - cover with a gloved hand, place 4x4 Vaseline gauze dressing over wound, and tape on three sides only.
- **Flail chest** - Support chest wall by taping or manual support.
- T**ension pneumothorax** - perform chest decompression per protocol

- **Oxygen** via BVM.

CIRCULATORY

Assess circulatory status (pulse, skin temperature, capillary refill, blood pressure as indicated)

- Vascular Access
- The goal is to support a systolic blood pressure of 90-100 mmHg.
- If circulatory status is in question, refer to shock protocol
- Intra Osseous infusions prior to IV attempts are acceptable for patients that are unstable with difficult peripheral access.

DISABILITY

Assess neurologic status using AVPU

- Alert
- Responds to voice
- Responds to pain

If unresponsive

- Immobilize patient with backboard and cervical collar as indicated
- Patient should be immobilized as soon as possible; however, immobilization should not take priority over assessment and management of the ABCs.

If patient exhibits decreased level of consciousness, follow altered level of consciousness protocol

SPINAL IMMOBILIZATION

Determining the need for spinal immobilization requires a careful assessment of the mechanism of injury, the patient's complaints, overall condition and the patient's ability to recognize and convey the presence of spinal injury symptoms. Spinal immobilization can be applied by C-Collar or full Spinal Motion restriction (C-Collar and Long Back Board) when any concern exists as to the possibility of spinal trauma.

Any patient who has an altered mental status (GCS <15, significant intoxication, Dementia) who is the victim of blunt trauma as listed below shall receive full SMR.

- Any mechanism that produces a violent impact to the head, neck, torso or pelvis
- Incidents with sudden acceleration or deceleration.
- Any fall, especially in the elderly
- Ejection
- Shallow-water drowning or diving accidents
- High-voltage electrical injuries

Symptoms such as spinal tenderness, neurological deficits or complaints, paralysis, weakness or anatomical deformities of the spine shall be documented, and patient shall receive full SMR.

For patients who cannot tolerate supine position due to clinical condition:

- Apply all elements of spinal immobilization that the patient will tolerate
- Maintain spinal alignment as best as can be achieved during transport
- Clearly document the clinical condition that interfered with full immobilization.
- Patients that only complain of neck pain with no neurological deficits or significant mechanism of injury may receive C-Collar only.

For patients who refuse spinal immobilization

- Advise the patient of the indication for immobilization and the risks of refusing the intervention
- If the patient allows, apply the cervical collar even if backboard is refused
- Maintain spinal alignment as best as can be achieved during transport
- Clearly document refusal of immobilization

“Clearing” of the spine shall not take place in the pre-hospital setting. EXPOSURE

- Undress patient completely to facilitate a thorough, focused survey.
- Cover with blankets to prevent loss of body heat and preserve modesty.
- To facilitate rapid transport; the patient should be evacuated to the ambulance for the focused survey.

Assess extremities

- Splint suspected fracture sites in most appropriate fashion after checking **pulses, motor function** and **sensation**.
- If the patient is critically injured, utilization of the long spine board as a total body splint is a time and resource efficient procedure.
- Femur fractures may be immobilized with traction splints.
- Fractures may be immobilized with air splints, ladder splints, or board splints in order to immobilize the joint above and below the injured area.
- Place cold pack on suspected fracture sites if time and resources allow.
- If distal vascular deficits noted, reduce fracture in anatomical alignment and splint in most appropriate fashion.

Recheck pulse, motor function and sensation after reduction and immobilization.

If partial amputation:

- Place in a dressing moistened with Normal Saline and splint in line with associated extremity.
- Avoid torsion or traction of severed part;

If complete amputation:

- Apply direct pressure to bleeding sites.
- Elevate above the level of the heart as able.
- If bleeding profuse despite elevation and direct pressure, place blood pressure cuff just proximal to amputation site and inflate to just above systolic pressure. Maintain cuff pressure during transport. Do not place cuff over joints.
- Consider applying a **Tourniquet** prior to shock and notify hospital immediately upon arrival.
- Wrap amputated part in a dressing moistened with Normal Saline.
- Secure in watertight container and place container in cool water.
- Transport amputated part with patient to definitive care facility.
- **Placing the amputated part on ice or a similar environment may further damage the tissue and prevent its use**.

Special considerations in the pregnant trauma victim:

- A trauma alert shall be called along with transportation to the closest trauma center for any pregnant female,>20 weeks gestation that has been involved in an MVC at >35 mph and/or rollover, ejection, steering wheel deformity or if the patient was involved in trauma with a significant mechanism of injury that leads to a high index of suspicion.
- The most common cause of fetal mortality is maternal mortality. Treatment of the mother **ALWAYS** comes first.
- Assess patient for uterine contractions, vaginal bleeding, and amniotic rupture.
- **Place patient in left lateral recovery position** to decrease pressure on the mother's vena cava and increase blood return to her heart. Support backboard with pillows placed under the right side of the board in the immobilized patient.
- If unable to place mother in recovery position, you may manually displace the uterus to the left to relieve pressure on the vena cava.

Re-assess

- Reassess any of the above critical injuries identified and perform necessary interventions during the focused survey. Treatment of life threatening injuries identified during the initial survey take priority over a complete subsequent survey.
- Notify the receiving hospital early regarding critical patients or those patients meeting trauma alert criteria.
- Report revised trauma score and mechanism of injury.

All Trauma patients should be evaluated using the state trauma scorecard methodology. Pain Management Options

- Fentanyl 25-50mcg IVP/IO may be administered for isolated extremity pain, may be repeated a total of 3 times
- **Morphine Sulfate** 1-5 mg IVP/IO may be administered for isolated extremity pain.

TRAUMA PROTOCOL
BURNS

CHAPTER 24.5.2

Issued: May 2010

Revised: June 11, Feb 14 Submitted By: Technical Services Approved By: Medical Director

Protocol

- Basic Medical Care
- Airway management
  - Patients with known inhalation injury or with signs of potential airway burns (singed nasal hair, soot in the pharynx, etc.) in respiratory distress should be intubated with the largest endotracheal tube possible.
- Remove all clothing from patient and expose all burned areas
- Assess type, depth, and extent of burn
- If indicated cool burn for 1-2 minutes

- If burning agent still in contact with skin
  - Remove gently after cooling with sterile water or Normal Saline.
- If burning agent is **chemical**:
  - Brush away loose, dry agent and irrigate burned area with copious amounts (2 or more liters) of Normal Saline or sterile water.
- If an **explosion** is involved:
  - Follow trauma protocol
- For **Radiation** Burn: decontamination is paramount.
  - Utilize bunker gear for protection; remember time, distance, shielding and quantity relating to the exposure. Treat burns the same.
- In all cases avoid recontamination or cross contamination
- **If patient has > 5% body surface area (BSA) second degree or any third degree burn:**
  - Vascular Access
    - Avoid starting lines in burned areas if possible
  - Run IVF at the rate using the following formula:
  - Adults receive 500ml/hr
  - Children receive 250ml/hr
  - Infants receive 100ml/hr

<u>Do not delay transport to establish IV</u>

- **Dress burns:**

  - Transport patient in **dry** non-sterile sheets or bandages regardless of extent of burn

  - Document area involved on chart using "**Rule of Nines**."

  - Maintain temperature control.

    - Keep patient warm
    - Wrap in blankets as needed
    - DO NOT ALLOW PATIENT TO BECOME HYPOTHERMIC
- **For Pain relief:**
    - Administer **Morphine Sulfate** 1-5 mg IVP/IO if patient hemodynamically stable
    - Dose may be repeated every 5 minutes prn

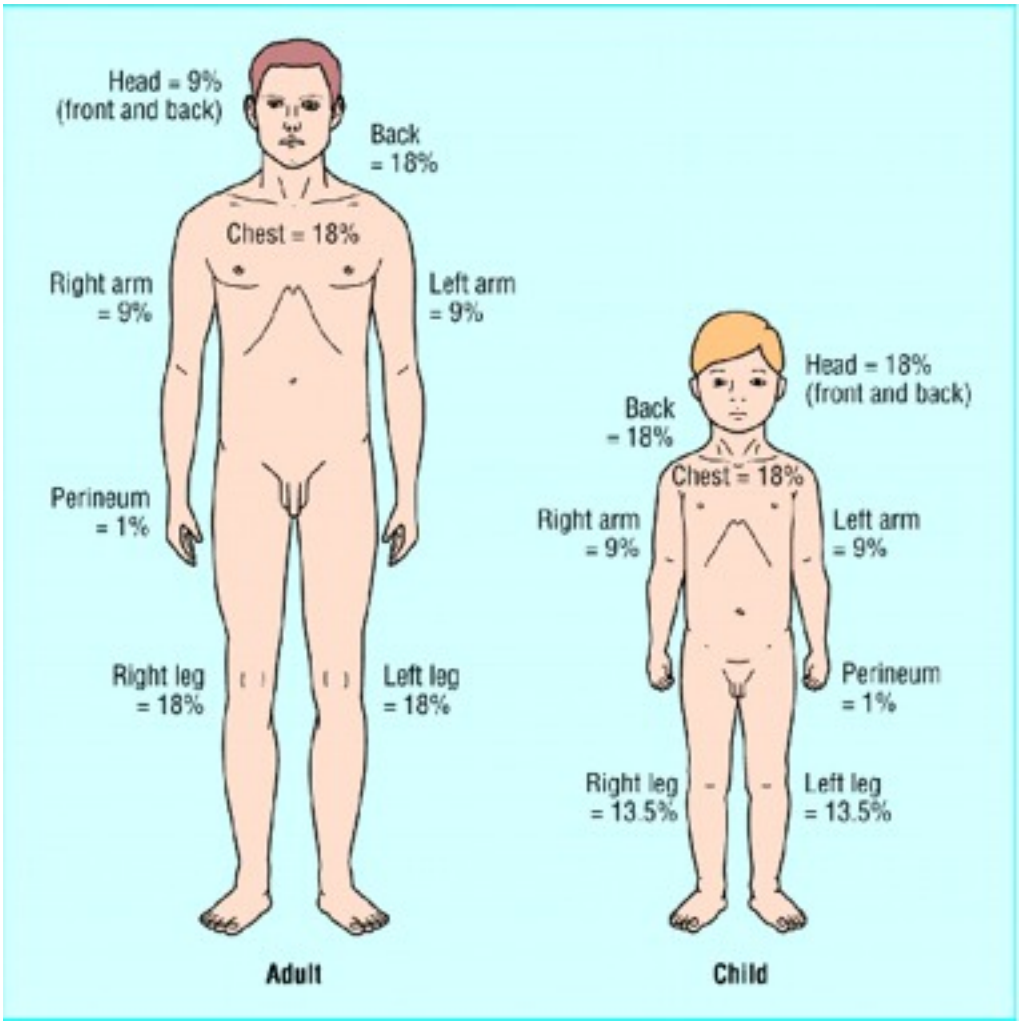
- Transport to Shands @ UF (Burn Center):
    - Partial thickness burn involving > 20% BSA
    - Full thickness burn involving > 5% BSA
    - Burns of the hands, face, feet, or perineum
    - Burns associated with inhalation injuries
- Burns associated with multiple trauma
    - Electrical injuries

MEDICAL CONTROL OPTION:
Repeat any of the above Standing Orders

Click link to view **BURN REVIEW**

Burn Review

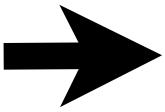
Rule of 9's



- The whole arm is 9% (front 4.5%, back 4.5%)
- The whole leg is 18% (front 9%, back 9%)
- Small or patchy burns can be approximated by using the surface area of the patient's palm
- Palm size has classically been considered to represent 1 %
- more accurately represents 0.4%
- the entire hand represents 0.8% of the TBSA

1st Degree

DO NOT ADD



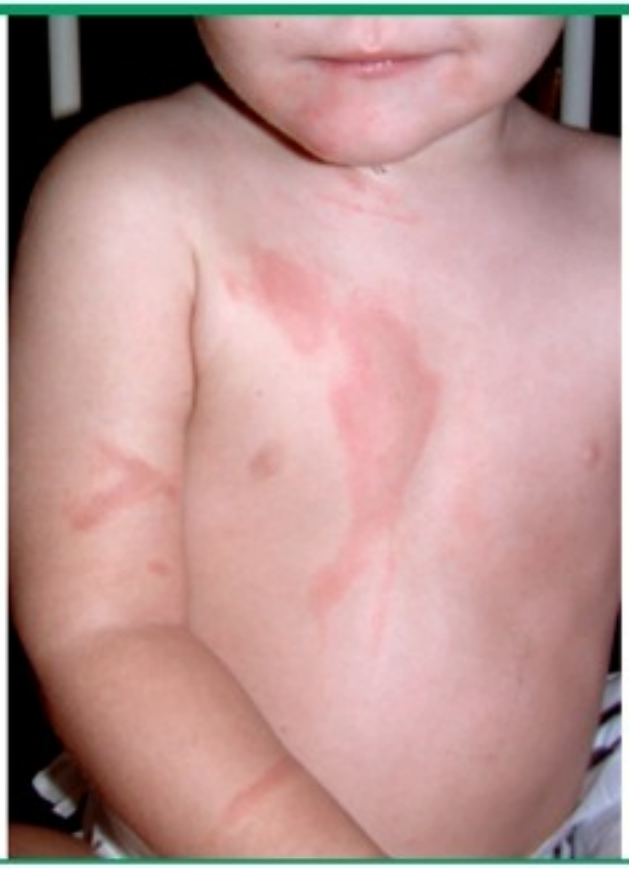
2nd Degree

3rd Degree

Depth	Cause	Appearance	Sensation
Superficial	Ultraviolet exposure Very short flash	Dry, red Blanches with pressure	Painful
Superficial partial-thickness	Scald (spill or splash) Short flash	Blisters Moist, red, weeping Blanches with pressure	Painful to temperature and air
Deep partial-thickness	Scald (spill) Flame Oil Grease	Blisters (easily unroofed) Wet or waxy dry Variable color (patchy to cheesy white to red) Does not blanch with pressure	Perceptive of pressure only
Full-thickness	Scald (immersion) Flame Steam Oil Grease Chemical Electrical	Waxy white to leathery gray to charred and black Dry and inelastic No blanching with pressure	Deep pressure only

1st

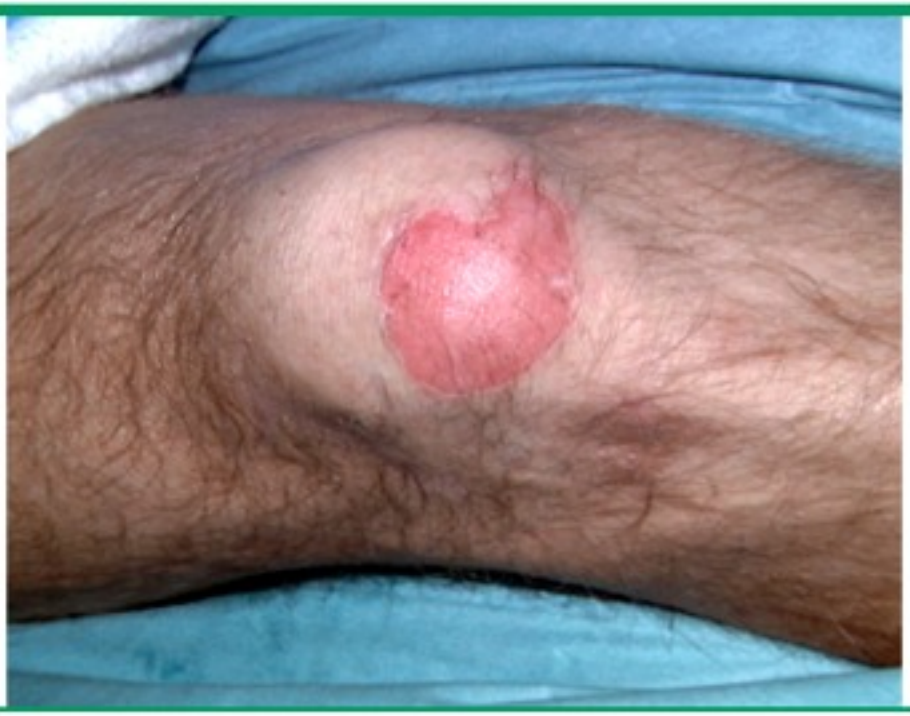
Superficial burn



Red burns that blanch are typical of superficial burns. *Courtesy of Eric D Morgan and William F Miser, MD.*

2nd

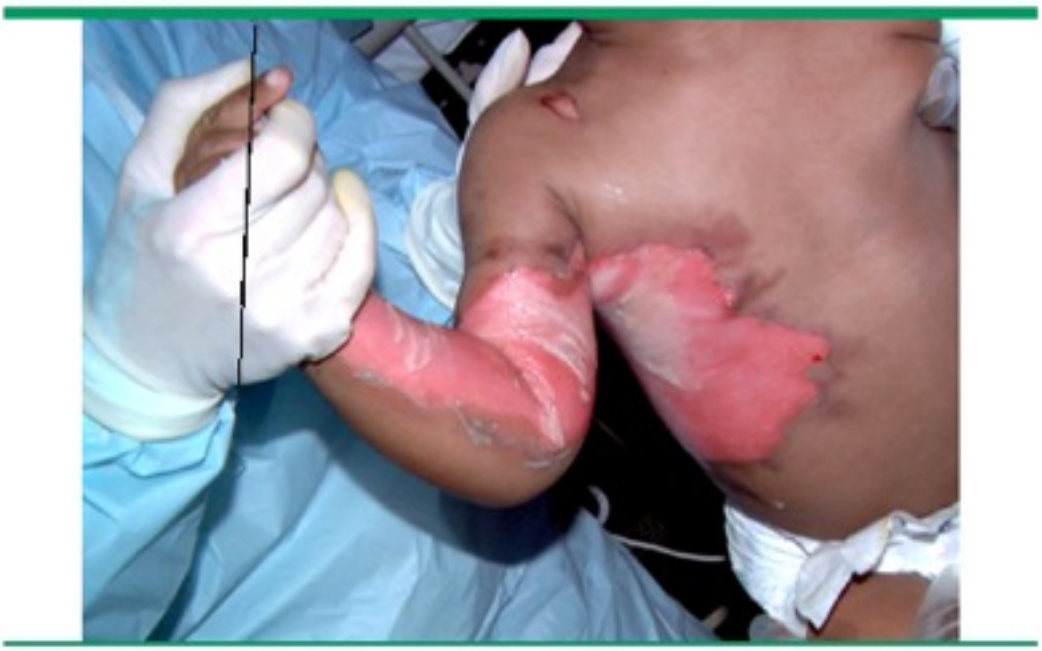
Superficial partial-thickness burn



Blistering burns that blanch with pressure characterize superficial partial-thickness burns. They are also typically moist and weep. *Courtesy of Eric D Morgan and William F Miser, MD.*

2nd

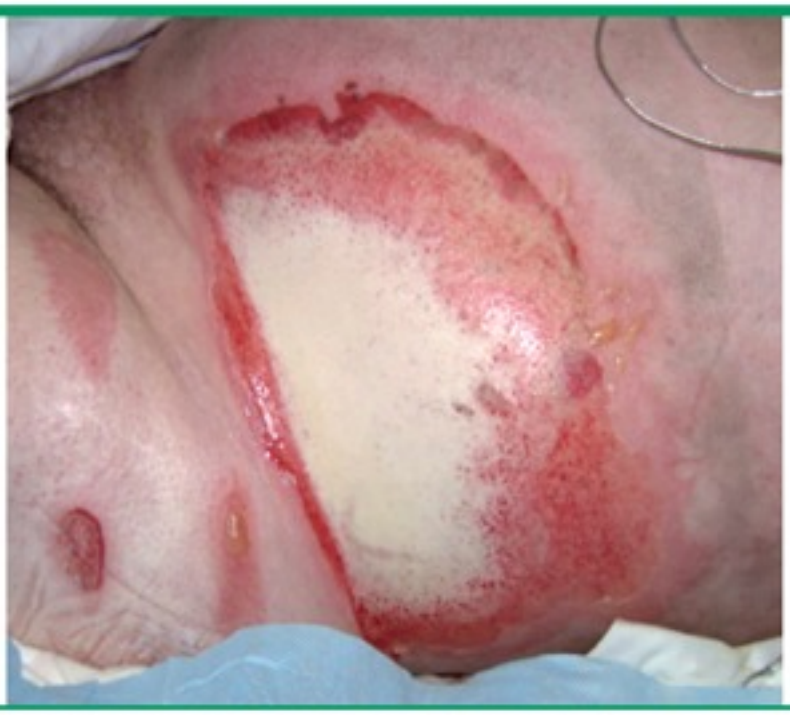
Deep partial-thickness burn



Easily unroofed blisters that do not blanch with pressure and have a waxy appearance typify deep partial-thickness burns. *Courtesy of Eric D Morgan and William F Miser, MD.*

3rd

Full-thickness burn



Burn areas that are waxy white or leathery gray and insensate characterize full-thickness burns. *Courtesy of Eric D Morgan, MD and William F Miser, MD.*

TRAUMA PROTOCOL
EYE EMERGENCIES
CHAPTER 24.5.3
Issued: May 2010

Revised: June 11, Aug 11 Submitted By: Technical Services Approved By: Medical Director

Protocol

- Basic Medical Care
- Assess the nature of eye emergency - **blunt vs. penetrating, chemical, glaucoma (by history**), or others
  - Briefly check visual fields and visual acuity
  - Transport with head of bed elevated at 60 degrees
  - Trivial injuries to eyelids may hide significant injury to the globe
- **Penetrating Trauma**:
  - Avoid any pressure on the affected globe
  - Carefully secure penetrating objects
  - If possible, cover the affected eye with a metal eye shield
  - Patch both eyes to prevent conjugate movement
    - Explain to the patient why it is necessary to patch both eyes
  - If possible, transport patient in supine position
- **Blunt Trauma**:
  - If no contraindications, elevate head of bed.
  - Avoid bright lights (Dim compartment lights, allow patient to wear sunglasses, keep eyes closed, etc). In cases of facial trauma, note the ability or loss of ability to move the eyes in any particular direction.
- **Chemical trauma**:
  - Irrigate affected eye with a minimum of 2 liters **Normal Saline**.
  - Continue irrigation throughout transport if the chemical was an alkali agent, or if symptoms persist.
  - Dim cabin lights for patient comfort.
- **If patient is being transported for treatment of diagnosed central retinal artery occlusion:**(This is an Eye emergency that presents as acute painless persistent loss of vision ranging from seeing fingers to only seeing light. Many may describe a prior episode of amaurosis fugax = which is vision loss described as a curtain falling over visual field lasting seconds to minutes then vision returning to normal)
  - Administer **100% OXYGEN** via NRBM.
  - **Place patient in supine position.**
  - Transport emergently to the receiving hospital.

MEDICAL CONTROL OPTIONS:
- **Morphine Sulfate** 1-5 mg IVP/IO for pain

OB/GYN PROTOCOL
SUSPECTED ECTOPIC PREGNANCY
CHAPTER 24.6.2

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Medical Care
Airway management
Vascular Access x 2
Keep accurate count of used perineal pads
Save any clots or tissue expelled for examination by physician upon arrival at receiving facility
If signs of shock are noted:
- Refer to Shock protocol

Physical Exam:
- Abdominal bruising, distention, tenderness, guarding, rebound tenderness, rigidity, bowel sounds, distension, presence of a pulsating mass
- Are peripheral pulses equal?
- Emesis: amount and type [ingested food, bloody, bilious, feculent (looks and smells like stool)]
- Ruptured Ectopic Pregnancy:
- May present as a pale, diaphoretic, distressed woman with a weak, fast pulse.
- May have orthostatic hypotension
- Refer to shock protocol

Warning signs of an undiagnosed ectopic pregnancy:
- Previous **recent** visits to the ED or physician's office with menstrual irregularity and/or mild abdominal pain with no diagnosis being made.
- May complain of abdominal pain and/or vaginal bleeding.

Warning signs of a ruptured ectopic pregnancy:
- Increased abdominal or pelvic pain
- Dizziness, fainting
- Pain radiating to the shoulder from pelvic area

OB/GYN PROTOCOL
VAGINAL BLEEDING
CHAPTER 24.6.1
Issued: May 2010

Revised: May 13 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Basic Medical Care
Airway management
Ascertain patient history specifically for:

- Date of **L**ast **M**enstrual **P**eriod (**LMP**)

- Position patient tilted right side up 10-15 degrees
- Vascular Access
- Attempt to obtain fetal heart tones if pregnancy is estimated greater than 10-12 weeks
- If hypotensive
  - See Shock protocol
- If in active labor
  - See Emergency Delivery protocol
- Keep accurate count of used perineal pads
- Save any clots or tissue expelled for examination by physician upon arrival at receiving facility

Transport expeditiously

NOTE: Monitor pad usage - Two saturated pads are equivalent to one pint (~ 250ml) of fluid/ blood loss.

DO NOT let anyone perform vaginal or rectal examination on the patient. Vaginal bleeding may markedly increase and hypovolemia may result.

MEDICAL CONTROL OPTIONS:
- **Morphine Sulfate** 1-5 mg IVP/IO.
- Versed 1-2 mg SIVP/IM/IN for anxiety.

Differential Diagnosis:
Ruptured ectopic pregnancy ruptured ovarian cyst, abortion, threatened abortion, appendicitis, cholecystitis, diverticulitis, colitis, and kidney stones.

OB/GYN PROTOCOL
PRE-ECLAMPSIA
CHAPTER 24.6.3
Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Third Trimester Pregnancy with B/P greater than 140/90 Hg/mm, proteinuria, and peripheral edema. May progress to eclampsia.

Protocol

Basic Medical Care
Airway management
Position patient tilted right side up 10-15 degrees
Vascular Access

Physical Examination:
- Mild hypertension (diastolic BP < 100 mmHg) usually no symptoms
- Severe Hypertension (diastolic BP ≥ 110 mmHg) may cause:
  - Headache
  - Visual disturbance
  - Upper abdominal pain
  - Jaundice
  - Bruises
  - Pulmonary edema

Transport expeditiously

If seizures occur, refer to ECLAMPSIA protocol

MEDICAL CONTROL OPTIONS
If hypertensive and symptomatic, contact medical control for possible Magnesium **sulfate** order.

Monitor blood pressure, fetal heart rate, respiratory rate and, if possible, urine output before and during Magnesium sulfate therapy.

If hypertension (systolic BP ≥ 170 or diastolic BP ≥ 120) and symptoms persists after administration of **Magnesium sulfate,** refer to hypertension protocol.

NOTE: LOWERING BLOOD PRESSURE TO LESS THAN 150/100 IN SEVERE PRE-ECLAMPSIA MAY COMPROMISE FETOPLACENTAL BLOOD FLOW.

OB/GYN PROTOCOL
ECLAMPSIA
CHAPTER 24.6.4
Issued: May 2010

Revised: May 13 Submitted By: Technical Services Approved By: Medical Director

Pre-eclampsia with seizure activity
Protocol

Basic Medical Care
Airway management
Position patient tilted right side up 10-15 degrees
Vascular Access

Seizure precautions and attempt to prevent maternal injury

- Administer **Magnesium sulfate** 2 gm IVP over 5 minutes
- Initiate **Magnesium** infusion (10 gm in 250ml of **Normal Saline**) @ 50 ml/hr
- If already receiving **Magnesium sulfate** infusion when seizure occurs, give an additional 2 gm bolus of **Magnesium sulfate**.
- If severe hypertension (systolic BP $\geq$ 170 or diastolic BP $\geq$ 120) persists after administration of Magnesium sulfate:
  - See Hypertension protocol
  - If unresponsive to therapy, call MCP.

Transport expeditiously

MEDICAL CONTROL OPTIONS:

- For seizures that continue despite Magnesium sulfate:
  - Use **Versed 1-2 mg SIVP/IM/IN**
  - Repeat in 2 minutes if seizures do not resolve.

Lowering diastolic blood pressure to less than 90-100 mm/hg may compromise fetoplacental blood flow.

OB/GYN PROTOCOL
PROLAPSED UMBILICAL CORD

CHAPTER 24.6.5

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

Basic Medical Care
Airway management
Shock protocol
Monitor Fetal Heart Rate abdominally and indicate time accurately
Transport expeditiously

- Position the patient in Shock Position or on **left lateral side** with knees flexed
- Instruct mother to pant, and **not** to push during contractions
- Insert sterile gloved hand into vagina and elevate the presenting fetal part to prevent cord compression. Leave hand in place and avoid touching cord.
- Cover exposed cord with sterile saline gauze
- If crowning noted, prepare to assist with vaginal delivery
- If delivery is inevitable prior to arrival at the hospital, attempt gentle manual replacement of cord into the uterus. This should only be done just prior to actual delivery, or on advice of medical control.

MEDICAL CONTROL OPTIONS:

Magnesium **sulfate** 1-5 gm IVP over 30 minutes

OB/GYN PROTOCOL
EMERGENCY DELIVERY
CHAPTER 24.6.6
Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

History
- Time when contractions began
- Has “water broken”
- Obstetrical History
- Number of previous deliveries
- Complications in previous pregnancies, abnormal presentation, multiple pregnancy, hemorrhage
- Known complications in this pregnancy
- Due Date, Date of last period (i.e. is this a premature delivery?)
- Has there been meconium staining of amniotic fluid?

Physical Examination
Determine that delivery is imminent by assessing for the following signs:
- Bulging perineum
- Crowning (top of baby’s head visible)
- Contractions less than 2 minutes apart and reported as strong by mother

Delivery
- Prep mother and delivery area with drapes.
- As the infant’s head delivers, use the palm of your hand to gently apply pressure to his/her head preventing a rapid, uncontrolled delivery.
- Support the infant’s head as it emerges from the vagina.
- Allow the head to rotate to one side.
- Aspirate mouth and then nose with bulb syringe.
- Wipe any mucous from the infant’s face with gauze.
- After delivery of the head, examine the neck for a looped umbilical cord.
- If found, gently remove it by slipping it over the head of the infant.
- If wrapped tightly, clamp the cord in two places.
- Using scissors cut between the clamps.
- Begin to deliver the infant’s shoulder.
- Position your hands on either side of the infant’s head.
- Exert **gentle** downward pressure as you deliver the anterior shoulder, then guide the head upwards and deliver the posterior shoulder.
- Be careful to securely grasp the infant, as he/she will be slippery.
- Keep the baby at a level below or equal to the mother until the umbilical cord is clamped.
- Clamp the cord in two locations (minimum of 6-8 inches from baby).
- Position the clamps one-inch apart.
- Cut cord with scalpel or scissors.

CAUTION: Remember not to cut the cord too close to the infant. It can always be made shorter later.

After the Delivery

Keep the mother and infant warm.
Evaluate infant.
Obtain APGAR score at 1 and 5 minute marks.

Placenta delivery

- The placenta will deliver spontaneously usually within 15 minutes of the infant. Do not force the placenta to deliver.
- Signs of separation include: gush of blood from the vagina, lengthening of the umbilical cord, uterine fundus rising upward in the patient's abdomen, or uterus becoming firmer.
- Massaging the uterus and/ or allowing baby to nurse may facilitate uterine contractions and delivery of the placenta.
- Massage uterine fundus as soon as it shows signs of relaxing;
- Check the patient's vaginal and perineal area for excessive bleeding.
- If patient becomes hypotensive, refer to shock protocol

Meconium (fetal fecal material) aspiration:

- When there is thick meconium staining of the amniotic the infants mouth then nose should be suctioned with a meconium aspirator until secretions are cleared or appear thin and watery.
- Suctioning should be preformed after the head emerges but prior to the delivery of the body.

If infant requires resuscitation, refer to NEONATAL RESUSCITATION PROTOCOL

- Indications for neonatal resuscitation include: meconium staining, lack of spontaneous breathing, pulse rate less than 100 BPM after birth despite **Oxygen** and **stimulation**.

Document the following:

- Presentation
- Date and time of birth of baby and placenta
- Gender of infant
- Position of cord at delivery
- Appearance of amniotic fluid (brown, green, clear)
- Complications

OB/GYN PROTOCOL
NEONATAL RESUSCITATION
CHAPTER 24.6.7

Issued: May 2010

Revised: May 13, Dec 13 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Deliver infant in method consistent with emergency childbirth protocol
Suction mouth and nose of infant with bulb syringe or appropriate suction device

- In the infant with thick, particulate meconium, suctioning should be performed upon delivery of the head, **PRIOR TO** delivery of the body.
- Upon delivery of the body and prior to ventilation, Infants should be **immediately intubated** and meconium suctioned through the ET tube until no more meconium is present
- The infant may **then** be ventilated with positive pressure as indicate.
- Failure to clear the trachea before assisted or spontaneous ventilation will disseminate meconium through airways, severely impairing chances for survival.
- Warm and dry infant
- Apply tactile stimulus to feet and back of infant to stimulate a vigorous respiratory effort
- Assess APGAR

If respiratory effort adequate:

- Place infant in slight Shock position.
- Turn head of infant to side

If respiratory effort inadequate:

- Manage Airway and support ventilations
- Assess heart rate and respiratory status frequently
- If spontaneous respirations return and patient has not been intubated, continue to provide 100% **OXYGEN** to patient via facemask.
- If infant remains apneic or bradycardic, continue with protocol

If brachial pulse less than 80 bpm:
- Assist ventilations with 100% **OXYGEN** via BVM or ETT
- If pulse remains less than 80, perform endotracheal intubation and ventilate
- Perform chest compressions at 120/min.
- Follow infant BLS protocols

If heart rate climbs greater than 80 bpm
- Cease compressions, maintain ventilation, and continue to administer 100% **Oxygen**

If no change in heart rate, continue with protocol.

If heart rate remains less than 80 bpm:
- CPR
- Vascular Access
  - If peripheral IV is unobtainable, IO access with pediatric IO needle can be inserted manually (Use of IO drill is contraindicated).
- Administer fluid bolus - **Normal Saline** 20ml/Kg
- Administer **Epinephrine** 0.01 mg/Kg IV.
  - May repeat every 5 minutes at higher dose of 0.1 mg/Kg
- Repeat fluid bolus of 20ml/Kg
- Consider 2 mEq/Kg 4.2% **Sodium Bicarb** if bradycardia prolonged
- Consider **Narcan** 0.1 mg/Kg IVP/IO/IN
- May repeat dose every 2 min as needed to avoid respiratory depression.
- Check BGL. IF less than 40 mg/dl, consider **Dextrose 10%** solution, 0.25 to 0.50 mg/Kg IVP

Apgar Scoring 0 points 1 point 2 points Heart Rate Absent <100 100 Respiratory Effort Absent Slow irregular Strong Cry Muscle tone Flaccid Some flexion Action motion Irritability No response Some response Vigorous Color Blue, Pale Body: Pink
Ext: blue
- Calculate **one** and **five** minute APGAR scores as time permits

PROCEDURAL PROTOCOL
12 LEAD EKG
CHAPTER 24.7.1
Issued: May 2010

Revised: October 2010 Submitted By: Technical Services Approved By: Medical Director

Protocol

Indications for performing a 12-lead

- Non-traumatic chest pain/thoracic back pain
  - Epigastric pain where no evidence of GI cause
  - Sudden onset of SOB, diaphoresis, syncope (non-traumatic)
  - CHF/ Acute PE
  - Any diabetic with signs/symptoms suggesting cardiac etiology
  - Any overdose with potential cardiac effects (tricyclics, Beta blockers, calcium channel blockers, etc.)
  - Whenever physician or paramedic deems it necessary
- Obtain rhythm strip prior to 12-lead EKG
- Assess and treat any life threatening conditions or arrythmias
- Perform assesment and obtain baseline vital signs
- If patient meets criteria, clean site and attach chest leads
- Obtain 12 Lead EKG
- Print 2 copies of 12-lead #1) for hospital, #2) for EMS reports

Suspect MI if:

  - **1 mm of ST segment elevation** is seen in 2 or more contiguous V-leads or limb leads

- **If evidence of inferior AMI is present (leads ll, lll, and AVF) obtain right side chest lead EKG utilizing V4R. Treat patient accordingly.**

- A 12-lead EKG is not recommended for trauma or unstable patients.

- In patients meeting criteria for STEMI Alert notification, notify the receiving hospital and transmit 12 Lead EKG for verification as soon as possible (see STEMI Alert SOG 24.7.15)

- Deliver radio report to the receiving facility en route and advise them that a 12 Lead EKG has been transmitted.

NOTE: Medications may alter the patients EKG; therefore, it is preferred that a 12 Lead EKG be obtained prior to the administration of medications and/or transport.

PROCEDURAL PROTOCOL
AUTOMATIC EXTERNAL DEFIBRILLATION
CHAPTER 24.7.2

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

The AED is to be used to treat patients of non-traumatic cardiac arrest who are greater than 8 years old.

The AED operator is in charge of patient care until ALS arrives on scene
The sequence of events:

- Establish unresponsiveness
- ABCs and CPR until defibrillator arrives
- If the arrest is not witnessed, perform 5 cycles of CPR prior to having AED analyze rhythm.
- Power on defibrillator and attach electrodes as directed
- State a brief situation report aloud (the AED will be recording sound)
- Analyze the patient's rhythm
- Do not allow anyone to touch the patient (including yourself)
- If "shock" is advised, state "I'm clear, you're clear, we're all clear" as you scan the patient from head to toe, to insure no one is touching the patient
- The AED will deliver a shock then immediately perform CPR for 2 minutes, check for signs of circulation.
- Re-analyze the patient's rhythm
- Deliver 1 more shock if directed to do so by the AED
- If patient is still pulseless, perform CPR for 2 minutes
- Re-analyze the patient's rhythm
- The operator may deliver 1 more shock
- If the patient remains pulseless, continue CPR until ALS arrives emphasizing on "Hard and Fast" compressions and enough ventilations to see the chest rise.
- If at any time the patient has a return of spontaneous circulation, but is not breathing, correct ABC's as needed
- If patient returns to spontaneous circulation, with breathing, place in recovery position and monitor ABC's until transport arrives.
- If the AED prompts rescuer to deliver shocks consecutively, the AED may be turned off until the end of 5th cycle of CPR or leave AED powered on and be prepared to listen to "motion detected" throughout CPR cycles.

PROCEDURAL PROTOCOL
BLOOD DRAW
CHAPTER 24.7.3
Issued: May 2010

Revised: April 2012 Submitted By: EMS Branch Approved By: Medical Director

Protocol

- Utilize Universal precautions
- Select vein and prep site as you would for IV cannulation
- Gather appropriate drawing devices
- Apply tourniquet
- Clean site with alcohol or betadine (do not use alcohol for cleansing site while drawing for LEA and blood alcohol levels.
- Insert needle or cannula
- Attach blood tubes to vacutainer and draw blood
  - All blood draw supplies will be provided by and collected from local receiving hospitals.
- Release tourniquet
- Withdraw needle and vacutainer
- Bandage site
- Label blood sample
  - Patient’s Name
  - Date and Time
  - Drawer’s initials

PROCEDURAL PROTOCOL
CHEST DECOMPRESSION

CHAPTER 24.7.4
Issued: May 2010

Revised: June 2011 Submitted By: Technical Branch Approved By: Medical Director

Protocol

- Determine need for chest decompression by clinical presentation of the patient (decreased breath sounds with signs and symptoms consistent with tension pneumothorax)
- Identify puncture site
    - Second intercostal space on affected side in the midclavicular line (strongly preferred);
    - Fourth intercostal space on affected side in midaxillary line
- Prepare skin at puncture site with Betadine or alcohol swabs
- Insert 14-16 gauge catheter perpendicular to the skin and over of inferior rib.
- Remove any parts from the catheter/needle assembly which may occlude the lumen)
- Listen for a rush of air. If noted, the diagnosis of pneumothorax and proper needle placement is confirmed.
- Alert receiving hospital personnel on arrival to the presence of this catheter.
- DO NOT UNDER ANY CIRCUMSTANCES remove this catheter from the patient.
- If Symptoms reoccur, there would be a concern for catheter displacement. In this case, place another catheter adjacent to the first catheter following the steps above.

PROCEDURAL PROTOCOL
CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)
CHAPTER 24.7.5

Issued: May 2010

Revised: Nov 12, Feb 14 Submitted By: EMS Branch Approved By: Medical Director

Protocol

Indications:

For patients with Acute Bronchospastic Disorders (acute or chronic bronchitis, emphysema, or asthma) or Acute Pulmonary Edema, who have hypoxemia and/or respiratory distress that do not or would not quickly improve with pharmaceutical treatment.

Contraindications:

- Respiratory arrest
- Agonal respirations
- Unconsciousness or obtunded
- Shock associated with cardiac insufficiency
- Trauma
- Persistent nausea and vomiting
- Facial anomalies
- Inability to cooperate with the procedure
- **CPAP should not be used in children under 12 years of age**
- Pneumothorax
- Active upper GI bleeding or history of recent gastric surgery

Equipment:

- Medical Director approved Continuous Positive Airway Pressure (CPAP) device

Procedure:

- Perform primary and secondary surveys
- Attach cardiac monitor, capnography, and pulse oximetry

- If indications present and systolic blood pressure >100, proceed with CPAP; if systolic blood pressure <100, contact Medical Control prior to beginning CPAP
- Verbally instruct patient (this is a critical item)
- Patient requires “verbal sedation” to use this device effectively
  - "You are going to feel some pressure from the mask but this will help you breathe easier.”
- Setup CPAP device as per manufacturer’s instructions
- Instruct patient to slowly breathe in through the nose and exhale through the mouth (exhalation phase should be about 4 seconds)
- For CHF/ACPE use a CPAP setting of 10cm H_20
- For COPD use a CPAP setting of 5cm H_20
- Continue treatment throughout transport to the ED
- Record and monitor vital signs, $ETCO_2$, and O_2 saturation as needed
- In the event of progressive respiratory and/or consciousness deterioration
  - Offer reassurance
  - Stop treatment if necessary
  - Apply bag valve mask to patient
  - Document adverse reactions, and reasons why CPAP was discontinued, in patient care report

The following items should be documented:

- CPAP level used
- Vital Signs every 5 minutes
- SpO2 every 5 minutes
- Response to treatment

PROCEDURAL PROTOCOL CRICOTHYROTOMY(SURGICAL AND NEEDLE)

CHAPTER 24.7.6
Issued: May 2010

Revised: Dec 14 Submitted By: EMS Branch Approved By: Medical Director

BACKGROUND

A surgical procedure used in medical and trauma patients requiring an emergent airway when a patient cannot be oxygenated and ventilated by a secondary device (LMA, King, ET tube, BVM, etc.)

EQUIPMENT:

- Scalpel
- Betadine or other antiseptic
- 5.0 – 6.0 endotracheal tube
- 4x4 gauze
- 10-12cc syringe
- Securing device
- SpO2
- ETCO2
- Cardiac monitor
- Suction
- O2 source
- BSI precautions
- BVM device

PROCEDURE:

- Determine the need for surgical cricothyrotomy
- Prepare equipment (check tube and pilot bulb, suction on and ready, BSI, O2 on with adequate volume)
- Identify anatomy and landmarks
- Clean site
- Make a 2-3 cm superficial midline vertical incision into dermis over the cricothyroid membrane to expose thyroid cartilage and cricothyroid membrane.
- Make a second horizontal incision through the cricothyroid membrane
- Dilate the opening
- Insert ET tube and inflate cuff
- Ventilate patient via Ambu bag and ET tube
- Control hemorrhage and verify placement (auscultation, SpO2, ETCO2)
- Secure tube and monitor for possible complications
- Document location of where tube was secured

NOTES:

- This procedure is contraindicated in patients less than 12 years of age
- In patients less than 12 years of age, a needle cricothyrotomy is recommended

NEEDLE CRICOTHYROTOMY EQUIPMENT:

- 14 gauge needle catheter
- Betadine or other antiseptic
- 3mm endotracheal tube adapter
- 4x4 gauze
- 10cc saline syringe
- IV Extension Set

- Meconium aspirator
- Tape to secure the device
- SpO2
- ETCO2
- Cardiac monitor
- Suction
- Extra suction tubing
- O2 source
- BSI precautions
- BVM device

PROCEDURE:

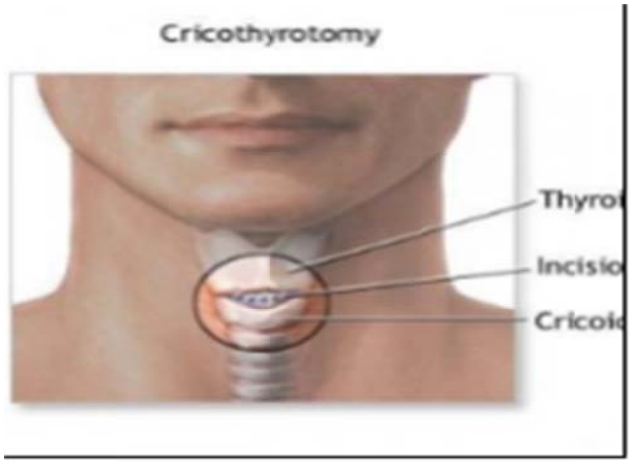
- In a needle cricothyrotomy
  - Equipment should be prepared
  - Anatomy and landmarks identified
  - Then a 14 gauge catheter attached to a 10cc syringe of normal saline is inserted into the cricothyroid membrane towards the patient's feet at an angle of 30-45 degrees aiming towards the head. While inserting needle, aspirate and when air is noted, you have entered the trachea.
  - Advance the catheter until the hub rests at the skin surface, you may remove syringe
  - Secure the catheter in place and connect catheter to a normal IV set up with a 3.0mm ETT adapter at the end of IV set up.
  - Next, attach the meconium aspirator to the 3.0mm ETT adapter
  - Then attach suction tubing to the meconium aspirator at one end and the oxygen source at the other (O2 flow at 15L unless a small neonate or toddler start at 8 and titrate up as needed)
  - Place finger over hole in aspirator until chest rise is noted then release to allow for expiration
  - Repeat this at an appropriate respiratory rate

NOTES

Contraindications:

- Able to perform successful endotracheal intubation
- Tracheal trauma

CRICOTHYROTOMY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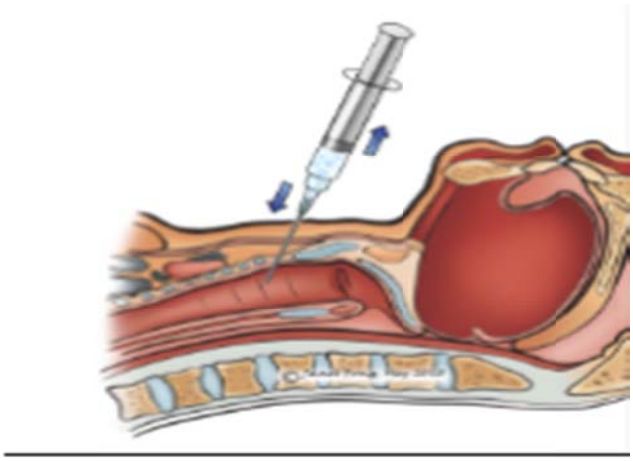
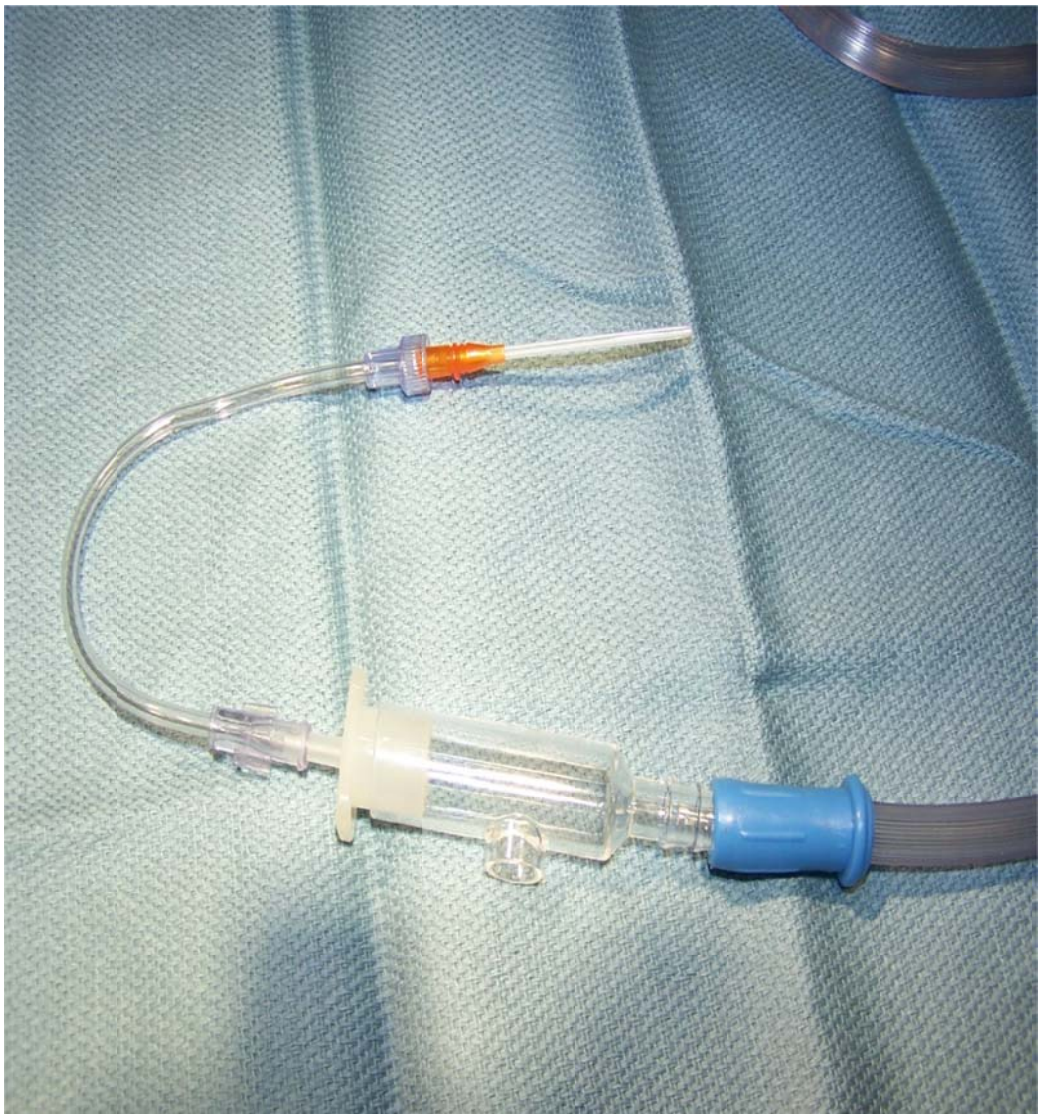




PROCEDURAL PROTOCOLS
CYANOKIT (Hydroxocobalamin for injection)

CHAPTER 24.7.7

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol:

Indication: Cyanokit is indicated for the treatment of known or suspected cyanid poisoning.

Identifying Patients with Cyanide Poisoning: Cyanide poisoning may result from inhalation, ingestion, or dermal exposure to various cyanide-containing compounds, including smoke from closed-space fires. These agents may present with an almond odor yet this cannot be a reliable indicator. Sources of cyanide poisoning include hydrogen cyanide and its salts, cyanogenic plants, aliphatic nitriles, and prolonged exposure to sodium nitroprusside. Most plastics, glues, and fabrics contain cyanide agents.

The presence and extent of cyanide poisoning are often unknown. There is no widely available, rapid, confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication. If clinical suspicion of cyanide poisoning is high, Cyanokit should be administered without delay.

Symptoms Signs *Headache * Altered Mental Status * Confusion * Seizures or Coma * Dyspnea * Mydriasis (dilated pupils) * Chest discomfort * Tachypnea / Hyperpnea (early) * Nausea * Bradypnea / Apnea (late) * Hypertension (early) / Hypotension (late) * Vomiting

Contraindication: *NONE*

Warnings and Precautions:

- *Emergency Patient Management*- In addition to Cyanokit, treatment of cyanide poisoning must include immediate attention to airway patency, adequacy of oxygenation and hydration, cardiovascular support, and management of any seizure activity. Consideration should be given to decontamination measures based on route of exposure.
- *Allergic Reaction*- Use caution in the management of patients with known anaphylactic reactions to hydroxocobalamin. Consideration should be given to use of alternative therapies if available. Allergic reactions may include anaphylaxis, chest discomfort, edema, urticaria, pruritus, dyspnea, and rash. Always treat any allergic reaction appropriately to the protocol.
- *Hypertension*- Many patients with cyanide poisoning will be hypotensive; however, elevations in blood pressure have also been observed in known or suspected cyanide poisoning victims. Although there has been no significant studies done on hydroxocobalamin and the affects on cyanide victims, there were elevations in blood pressure ≥180 mmHg systolic or ≥110 mmHg diastolic) in approximately 18% of healthy subjects (not exposed to cyanide) receiving hydroxocobalamin 5 g. Most affects were noticed in first 30 minutes of administering hydroxocobalamin.
- *Erythemia*- Non life threatening, yet a redness of the skin may proceed the administration of hydroxocobalamin along with red tint to urine.

Dosage and Administration:

- *Recommended Dosing*- The starting dose of hydroxocobalamin for adults is 5 g (i.e. both 2.5

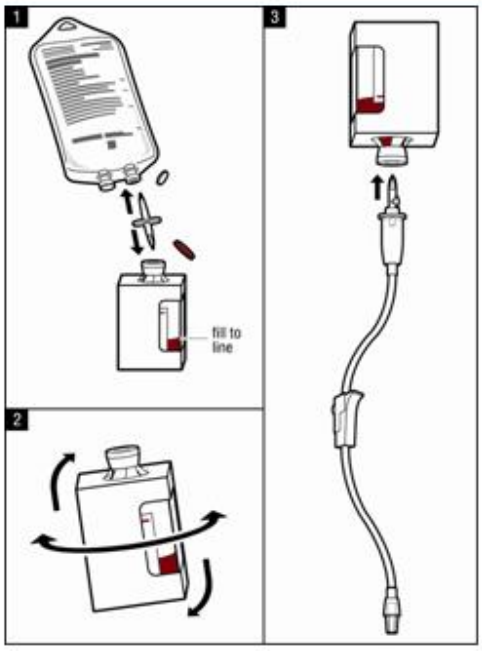
g vials) administered as an intravenous (IV) infusion over 15 minutes (total 5 g).There can be a second dose of 5g depending on severity of the poisoning. There have been no safety or efficacy studies performed in pediatric patients. Contact medical control for consultation about pediatric administration.

- *Preparation of Solution for Infusion*- Each 2.5 g vial of hydroxocobalamin for injection is to be reconstituted with 100 ml of Normal Saline (not typically supplied by manufacture) that will be supplied with injection kit. The line on each vial label represents 100 ml volume of diluent. After NS is mixed with lyophilized powder, each vial should be repeatedly inverted or rocked, not shaken, for at least 30 seconds prior to infusion. This solution should be visually inspected for particular matter and color prior to administration. If the reconstituted solution is not dark or if particular matter is seen after the solution has been appropriately mixed, the solution should be discarded.
- *Incompatibility Information*- **DO NOT** administer any drug simultaneously through same IV line as hydroxocobalamin.

Click to view **?** **Cyanokit Antidote Administration**

Cyanokit® Antidote Administration

- Reconstitute each 2.5 g vial with 100 mL of diluent using transfer spike
- Diluent may be Sodium Chloride for Injection, Lactated Ringers, or 5% Dextrose
- Invert or rock vial for at least 30 seconds; ***do not shake***
- Infuse 5 g at 15 mL/min
- Once reconstituted, Cyanokit is stable for up to 6 hours at temperatures not exceeding 40°C (104°F)



CYANOKIT® 5g
(hydroxocobalamin for injection) ANTIDOTE

Cyanokit® [package insert]. Napa, CA: DEY, LP; 2006.

PROCEDURAL PROTOCOLS
End Tidal CO2 Monitoring

CHAPTER 24.7.8

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

ELECTRIC WAVEFORM CAPNOGRAPHY

- Power on the Zoll E Series Cardiac Monitor and assure the ETCO2 cable is attached (The ETCO2 device takes approximately one minute to warm up when the monitor is powered on)
- Secure airway via endotracheal (ET) intubation. Be sure to follow manual confimation techniques (ie. Visualization of tube passing vocal chords, negative sounds over the epigastrium, fogging of the ET tube, etc.)
- Place $ETCO_2$ device with adapter on the end of ET tube between the ET tube and BVM.
- Press the "Wave 2" soft key until the CO2 waveform is displayed. (The default color will be in YELLOW)
- Attach the BVM to the open end of ETC02 device and administer ventilations
- Note the reading of patient CO2 levels on cardiac monitor
- Look for rhythmic and consistent waveform ETCO2 capnography on the display screen. (See examples below of normal and abnormal waveforms)
- If placement of tube is in question, remove the tube, ventilate patient for 30 seconds and attempt to intubate again
- If tube placement confirmed, consider possible causes of low end-tidal CO_2 (low cardiac output secondary to hypovolemia or cardiac failure, or cardiac arrest) and treat appropriately

Click to view ? **NORMAL CAPNOGRAM - ESOPHAGEAL INTUBATION - DISLODGED ET TUBE**

DIPOSABLE CO2 DETECTION DEVICE
(intended for use only when there is eletronic equipment failure or early access cannot be made to patient with the Zoll E Series Cardiac Monitor)

- Secure airway via endotracheal (ET) intubation
- Place CO_2 device on adapter end of ET tube
- Attach the BVM to the open end of ETC02 device and administer ventilations
- Complete at least **3 ventilations** before the electric ETCO2 device will register a color change or **6 ventilations** before the disposable device will register a color change
- If either device turns yellow with exhalation, tube placement is confirmed
- If the device remains purple
  - Reconfirm ET tube placement by direct visualization and auscultation
- If placement of tube is in question, remove the tube, ventilate patient for 30 seconds and attempt to intubate again
- If tube placement confirmed, consider possible causes of low end-tidal CO_2 (low cardiac output secondary to hypovolemia or cardiac failure, or cardiac arrest) and treat appropriately
- If device changes to Tan, consider low cardiac output from poor CPR or poor patient perfusion. Recheck tube placement by visualization, and correct as neccesary
- If device is yellow, but changes to purple during transport, recheck placement using steps as above

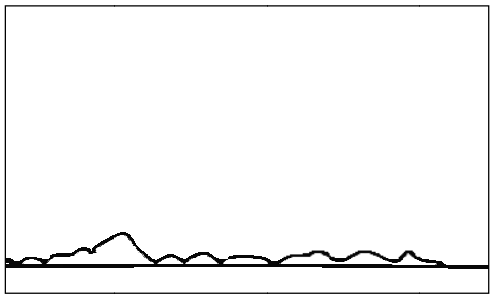
- The disposable devices are ineffective if they become wet
- Recheck placement of tube each time you move the patient or there is a change in his/her condition
- As soon as possible, apply electronic ETCO2 monitoring.

Normal Capnogram — Normal $EtCO_2$: 35 – 45 mmHg

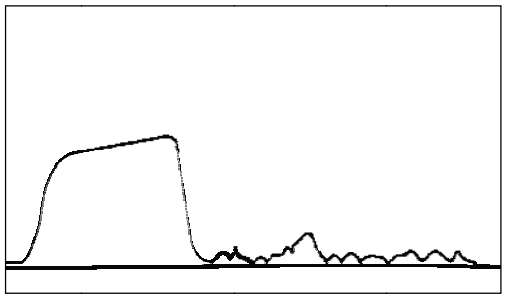
The "normal" capnogram is a waveform which represents the varying CO_2 level throughout the breath cycle.

Waveform Characteristics:

A-B	Baseline	D	End-Tidal Concentration
B-C	Expiratory Upstroke	D-E	Inspiration
C-D	Expiratory Plateau		



ESOPHAGEAL INTUBATION



DISLODGED ET TUBE

PROCEDURAL PROTOCOLS
ENDOTRACHEAL INTUBATION (NASAL & ORAL)

CHAPTER 24.7.9

Issued: May 2010 Revised: June 11, Aug 11, July 12
Jany 15, 2013

Submitted By: EMS Branch Approved BY: Medical Director

Protocol

- Select route of intubation
- Have all airway supplies and suction nearby

Orotracheal Intubation

- Hyper oxygenate patient with 100% O_2 using BVM prior to intubation attempt
- Attempts should be limited to 10 seconds
- Insert laryngoscope blade into oropharynx and visualize vocal cords
  - Miller blade (straight) is used to lift the epiglottis
  - Macintosh (curved) is placed in the vallecula and used to raise the larynx and therefore the epiglottis
- Remove any obstructing secretions or foreign bodies with suction and/or Magill forceps
- Insert endotracheal tube past vocal cords by visually confirming the placement before removing the laryngoscope
- If a stylet is used, remove it after the tube has passed the cords
- Inflate the cuff
- If no cervical spine injury is suspected, cricoid pressure may be used to reduce the risk of vomiting and to assists in visualization of the cords.
  - **Cricoid pressure is contraindicated in the placement of the King LTD Airway**
- After 2 failed attempts at endotracheal intubation (not 2 attempts per provider) a King LTD airway shall be immediately placed.
- In patients who have sustained trauma after any 2 failed attempts (even if done by a paramedic student) it is required that a King LTD airway then be placed by a cleared

paramedic.

- If the King LTD airway is unsuccessful, utilize a BVM with an OPA to oxygenate and ventilate this patient until arrival at the hospital.

- If unable to oxygenate, consider surgical cricothyrotomy.

- If endotracheal intubation or King LTD Airway is unsuccessful, the paramedic shall document and justify the failed attempts.

At any time the paramedic believes the patient would benefit from the King Tube device he/she may elect to not attempt Endotracheal Intubation.

Nasotracheal Intubation

Contraindicated in patients with facial fractures and/or a closed head injury

- Patient must have spontaneous respirations

- Maintain cervical spine immobilization if trauma is known or suspected

- Place patient on high flow **OXYGEN** via NRB prior to nasal intubation

- Consider use of 4ml of 2% Lidocaine via nebulizer mask. This will result in the complete or near complete loss of the gag reflex and facilitate patient compliance with the passage of the ET tube.

- Anesthesia can also be achieved by the placement of an NPA coated with 4% lidocaine jelly 3-5 minutes prior to intubation. Coat external nares and tip of endotracheal tube with 4% lidocaine jelly

- Apply the Beck Airway Airflow Monitor (BAAM) device on the end of the ET tube

- Insert tube with bevel side facing the septum. The tube should be advanced along the floor of the nose. Endotrol® tubes are helpful in controlling the position of the tip of the tube, **stylets cannot be used**. As the tube enters the pharynx, listen for breathing sounds to get louder (whistle with the BAAM device) as you advance closer to the trachea

- The patient is likely to cough or gag. Suction must be ready for use

- Listen for patient breathing and/or vocalizations. The vocal cords are widest apart upon inspiration

- Ask patient to take a deep, slow breath or when the patient inhales, advance tube quickly through cords

- Success is noted by an absence of further vocalizations and continued airflow through the

tube

- Inflate balloon
- Verify tube placement as you would with oral intubation
- Ventilate patient via ET tube with 100% O_2 using BVM
- Secure ET tube in place using locking device or tape
- Reassess and document tube placement after moving patient
- Continue with ventilation during transport with BVM or use a mechanical ventilation device

All intubations will be confirmed by the absence of breath sounds over the epigastrium and the presence of breath sounds over the right and left lung field. This shall be documented in the run report.

Electronic ETCO2 shall be measured **continually** on all intubations to verify tube placement. This information shall be documented in the run report as a separate intervention and shall include waveform capnography. If electronic ETCO2 is unavailable the use of a colorimetric device is acceptable.

Considerations

It is strongly suggested that the patient's head and neck be immobilized using a cervical collar and CID to prevent tube dislodgement during patient movement

To manage the airway of a patient with known or suspected trauma who vomits during airway procedures:

- Turn AS A UNIT on side and suction oral cavity. Maintain spinal immobilization throughout the turning maneuver
- If the patient becomes combative, consider Versed 1-2mg IV push to facilitate intubation. May repeat in 2 minutes. Closely monitor the patient who has received Versed for respiratory depression or arrest

On occasions when a patient has been intubated prior to arrival, confirmation of the airway placement shall be made by the presence of lung sounds and ETCO2 prior to acceptance. It is acceptable to manage airways that have been secured with alternate devices (LMA).

Any airway device shall be removed that is not properly ventilating (i.e. absent breath sounds, cyanosis or loss of waveform capnography) device shall be removed immediately.
REMEMBER:
The goal of airway management is to VENTILATE and OXYGENATE the patient, not necessarily to intubate the patient.

PROCEDURAL PROTOCOL
EXTERNAL CARDIAC PACING
CHAPTER 24.7.10
Issued: May 2010

Revised: May 13 Submitted By: EMS Branch Approved By: Medical Director

Protocol

- Place cardiac monitor limb leads on the patient
- Place defibrillator pads on patient (anterior and posterior)
- Turn Central Control Knob to **PACER** (Green)
- Set the Pacer Rate at 20-30 ppm higher than the patient's intrinsic rate. Default Pacer Rate is 70 ppm. **DO NOT EXCEED 80 ppm.**
- Turn Pacer Output (mA) until there is a defined "QRS" behind each pacer spike (**Electrical Capture**).
- Next, confirm mechanical capture by palpating a carotid and/or radial pulse.
- Once electrical and mechanical capture is obtained, increase the current (mA) by 10% to exceed the impedance threshold.
- Turn the Pacer Rate dial to adjust the patient's heart rate. This should be done to maintain a systolic BP > 100 mmHg. Do not exceed paced rate of 80 ppm
- To view the underlying rhythm , press and hold the 4:1 button (not recommended to prevent loss of mechanical capture)
- Administer **Versed 1-2 mg SIV/IO/IM/IN** , titrate to patient comfort to a maximum dose of 10 mg and a systolic blood pressure greater than 100 mmHg.

*****THINGS TO REMEMBER*****

- The Pacer will continue to pace if a limb lead is inadvertently removed or displaced
- If the monitor is turned off, the pacing function will resume if monitor is turned back on within 10 seconds
- The Zoll Eseries Monitor paces in the "Demand" function unless unsynchronized pacing is selected via the soft key.
- If the pacer stops due to the under lying rhythm rate exceeding that of the pacer (demand mode), be sure to check for presence of a corrolating carotid and/or radial pulse.

PROCEDURAL PROTOCOL
EZ-I0 INFUSION SYSTEM
CHAPTER 24.7.11
Issued: May 2010

Revised: Dec 13 Submitted By: Technical Services Approved By: Medical Director

Protocol

If the patient is conscious, advise of EMERGENT NEED for this procedure and obtain verbal consent

- Wear approved Body Substance Isolation Equipment (BSI)
- Determine EZ-IO AD® or EZ-IO PD® Indications
- Rule out Contraindications
- Locate appropriate insertion site, SEE (Location Sites)
- Prepare insertion site using aseptic technique (Alcohol Prep)
- Prepare the EZ-IO® driver and appropriate needle set
- Stabilize site and insert appropriate needle set
- Remove EZ-IO® driver from needle set while stabilizing catheter hub
- Remove stylette from catheter, place stylette in shuttle or approved sharps container Confirm placement
- Connect primed tubing
- Slowly administer appropriate dose of Lidocaine 2% (Preservative Free) IO to conscious patients
- Syringe bolus (flush) the EZ-IO® catheter with the appropriate amount of normal saline.
- Rapid syringe bolus (flush) the EZ-IO AD® with 10 ml of normal saline
- Rapid syringe bolus (flush) the EZ-IO AD® with 5 ml of normal saline
- Utilize pressure (pressure bag or infusion pump) for continuous infusions where applicable

for hemodynamically unstable adults, repeat flush as needed for pediatrics

- Begin infusion
- Dress site, secure tubing and apply wristband as directed
- Monitor EZ-IO® site and patient condition

APPROVED SITE LOCATIONS:
- **Proximal Tibial Tuberosity *(preferred site)*:** One index finger (1-2 cm) distal from tip of the medial aspect of tibia tuberosity.
- **Distal Tibial Tuberosity**: Two fingers (2-4 cm) proximal to the tip of most distal aspect of tibia (medial malleolus), insertion of IO being medial aspect of distal tibial anatomy.
- **Proximal Humerus:** Locate greater tubercle (flat portion of proximal humerus, 1-2 cm inferior to proximal tip), slightly anterior to humerus lateral midline. Arm is to be adducted with elbow posteriorly placed. Needle set should never enter or be medial to the intertubercular groove.

INDICATIONS:
- EZ-IO AD® (40 kg and over) & EZ-IO PD® (3 -39 kg)
- Intravenous fluids or medications are needed and a peripheral IV cannot be established in 2 attempts or 90 seconds AND the patient exhibits one or more of the following:
  - An altered mental status
  - Respiratory compromise
  - Hemodynamic instability
- EZ-IO AD® & EZ-IO PD® may be considered PRIOR to peripheral IV attempts in the following situations:
- Cardiac arrest (medical or traumatic)
- Profound hypovolemia with alteration of mental status
- Patient in extremis with immediate need for delivery of medications and/or fluids.

CONTRAINDICATIONS:
- Fracture of the bone selected for IO infusion *(consider alternate site)*
- Excessive tissue at insertion site with the absence of anatomical landmarks *(consider alternate site)*

- Previous significant orthopedic procedures *(IO within 24 hours, prosthesis -consider alternate site)*
- Infection at the site selected for insertion *(consider alternate site)*
- Neonates, 0-30 days, (manual insertion without the use of the drill).

CONSIDERATIONS:

- Flow rate: With the anatomy of the IO space you will note flow rates to be slower than those achieved with IV catheters.
- Ensure the administration of an appropriate rapid syringe bolus (flush) prior to infusion NO FLUSH = NO FLOW
- Rapid syringe bolus (flush) the EZ-IO AD® with 10 ml of normal saline
- Rapid syringe bolus (flush) the EZ-IO PD® with 5 ml of normal saline
- Repeat syringe bolus (flush) as needed
- To improve continuous infusion flow rates always use a syringe, pressure bag (with maximum pressure of 300 mm) or infusion pump if available.
- Pressure Infusion in adults only
- Pain: Insertion of the EZ-IO AD® & EZ-IO PD® in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a large bore IV). However, IO infusion for conscious patients has been noted to cause severe discomfort
- Prior to 10 ml syringe bolus (flush) or continuous infusion in alert patients:
- **EZ-IO** Slowly administer Lidocaine 2% (Preservative Free ie. cardiac Lidocaine) through the hub over 15 - 20 seconds.
- **EZ-IO AD**® Slowly administer 20 - 40 mg Lidocaine 2% (Preservative Free)
- **EZ-IO PD**® Slowly administer .5 mg / kg Lidocaine 2% (Preservative Free)
- May use flush after 1 minute.

EQUIPMENT:

- EZ-IO® Driver
- EZ-IO AD®

- EZ-IO PD® Needle Set Alcohol
- Betadine Swab
- EZ-Connect®
- Standard Extension Set 10 ml Syringe Normal Saline (or suitable sterile fluid)
- Pressure Bag
- Infusion Pump
- 2 % Lidocaine (preservative free)
- EZ-IO® Yellow wristband
- 3-way stop clock

PROCEDURAL PROTOCOL
INTRAVENOUS ACCESS/SALINE LOC
MUCOSAL ATOMIZATION DEVICE

CHAPTER 24.7.12
Issued: May 2010

Revised: June 11, Aug 11, May 13 Submitted By: Technical Services Approved By: Medical Director

IV Access/Saline Lock

Protocol

- Select site for IV placement
- Select appropriate size catheter for patient, things to consider:
  - Patient age/size
  - Vein size or integrity
  - Location of IV
  - Need for fluid replacement (i.e. hypovolemia, trauma, unstable B/P, Cardiac arrest, etc.)
  - Only use needle/catheter sizes that are available from ACFR supply
- Apply tourniquet snugly to area just proximal to intended puncture site
- Peripheral catheterization procedure
- Prepare skin with Betadine or alcohol swabs
- Secure vein with fingers ask patient or assistant to secure extremity
- Insert needle and catheter assembly into vein, bevel up; watch for free blood return
- When placement confirmed by blood return, advance catheter into the vein until you reach the hub
- Attach blood collection device and draw blood samples for hospital use as appropriate
- Remove tourniquet
- Saline Lock:

- Attach Saline Lock to catheter hub
- Insure patency by briefly flushing with fluid
- For IV:
- Attach drip solution set to IV catheter and administer a small amount of fluid to ensure patency
- Fluid should then continue to run at a rate indicated by the patient's condition and related protocol

*Secure catheter/saline lock with tape or occlusive dressing
*Do not place an IV on same side as an AV fistula or same side after a mastectomy with lymph node resection.

Mucosal Atomization Device:

Purpose: The nasal route is an attractive method of drug delivery due to the rich vascular plexus that is present within the nasal cavity and the easy accessibility of this vascular bed. Because of the easily accessed vascular bed, nasal administration of medications is a promising method of delivering medications directly to the blood stream.

Indications:
For use on patients with suspicion of opiate overdose, patients with ongoing generalized tonic-clonic seizures and Hypoglycemia.

1. Intranasal Narcan
2. Intranasal Versed
3. Intranasal Glucagon

Administration:
To maximize medication usage, no more than 1 ml of fluid should be atomized in the nostril at a time.

Technique:

1. Draw up medication with provided syringe vial adapter or needle.
2. Remove the syringe vial adapter or needle
3. Attached the atomizing tip
4. Using the free hand to hold the occiput of the head stable, place the tip of the MAD snugly against the nostril aiming slightly up and outward (toward the top of the ear)
5. Briskly compress the syringe plunger to deliver half of the medication into the nostril.
6. Move the device over to the opposite nostril and administer the remaining into the nostril if indicated.

The Atomizer device shall not be utilized as a replacement of IV access.

ATOMIZER INSTRUCTIONAL GUIDE

LMA MAD Nasal™ INTRANASAL MUCOSAL ATOMIZATION DEVICE

Using the LMA MAD Nasal™ Mucosal Atomization Device

Materials

LMA MAD Nasal™ with vial adapter and 1 mL (or 3 mL) syringe

Medication of appropriate concentration for intranasal medication delivery

Tips to Improve Success

1 Minimize volume, maximize concentration

- 1/3 mL per nostril is ideal, 1 mL is maximum
- Use the appropriately concentrated drug

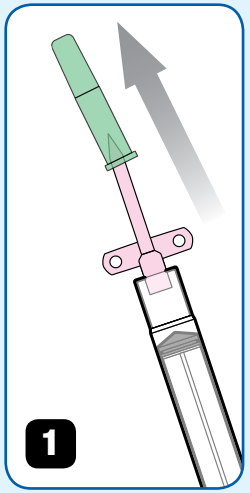
2 Maximize total mucosal absorptive surface area

- Atomize the drug (rather than drip it in) to cover broad surface area
- Use BOTH nostrils to double the absorptive surface area
- Aim slightly up and outwards to cover the turbinates and olfactory mucosa

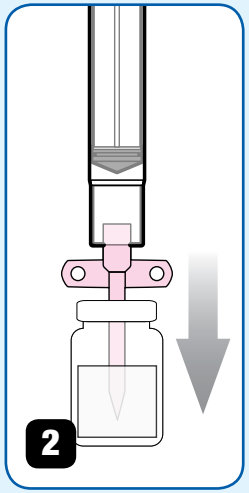
3 Beware of abnormal mucosal characteristics

- Mucous, blood and vasoconstrictors reduce absorption
- Suction nostrils or consider alternate drug deliver method in these situations.

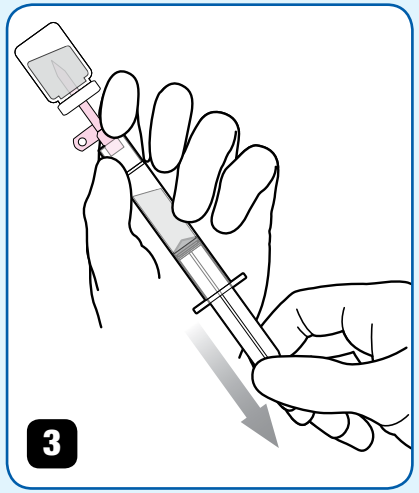
Procedure



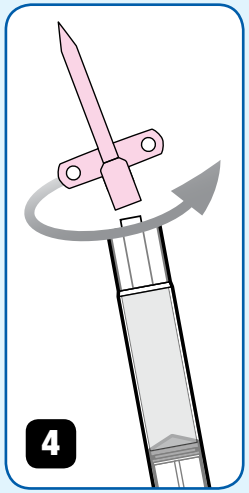
STEP 1: Remove and discard the green vial adapter cap.



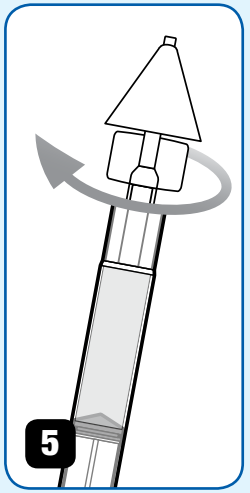
STEP 2: Pierce the medication vial with the syringe vial adapter.



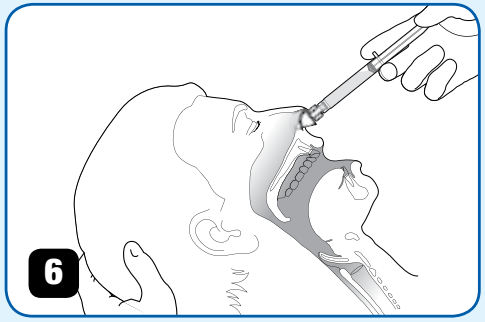
STEP 3: Aspirate the proper volume of medication required to treat the patient (an extra 0.1 mL of medication should be drawn up to account for the dead space in the device).



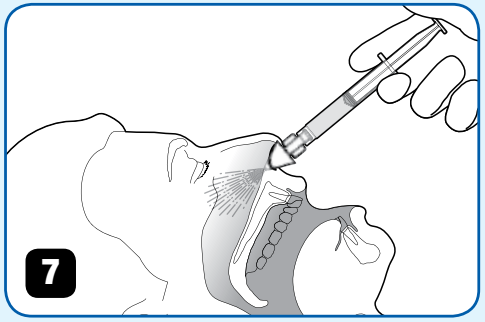
STEP 4: Remove (twist off) the syringe from the vial adapter.



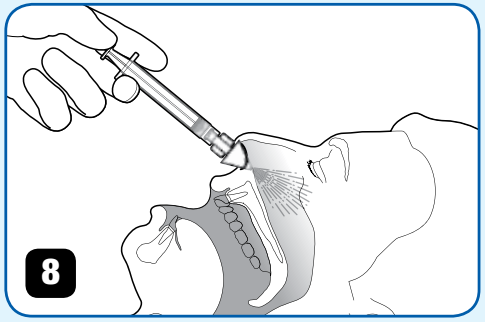
STEP 5: Attach the LMA MAD™ device to the syringe via the luer-lock connector



STEP 6: Using the free hand to hold the occiput of the head stable, place the tip of the LMA MAD Nasal™ snugly against the nostril aiming slightly up and outward (toward the top of the ear).



STEP 7: Briskly compress the syringe plunger to deliver half of the medication into the nostril.



STEP 8: Move the device over to the opposite nostril and administer the remaining medication into the nostril if indicated.

LMA™ Better by Design

4660 La Jolla Village Drive, Suite 900 • San Diego, CA 92122 • 800-788-7999 • Fax 858-622-4130 • www.LMANA.com

PROCEDURAL PROTOCOL
NASOGASTRIC TUBE PLACEMENT
CHAPTER 24.7.13
Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

- Explain the procedure to the patient and/or parent if appropriate;
- Select the proper size tube:

- Premature - newborn infant # 8 french
- 1 - 6 months # 8 - # 10 french
- 6 months - 2 years # 10 french
- 2 years - 8 years # 10 - 12 french
- 8 years and older # 14 - # 16 french
- Adults # 16 - # 18 french

Mark the distance the tube should be inserted:

- **For pediatric patients**, measure the tube by holding distal end of tube at patient's nose and extending tube to the tip of the earlobe and down to the xiphoid process. Mark the point on the tube
- **For adult patients**, measure the distance from the earlobe to the bridge of the nose and then from the bridge of the nose to below the xiphoid process.
- To aid in tube insertion, curl tube tightly around index finger and then release. Lubricate distal end of tube with water-soluble lubricant
- Place the patient in a semi-upright position if condition permits
- Gently insert tube into nare. When resistance is felt, apply gentle downward pressure to advance tube
- With the tube just above the oropharynx, instruct the patient to swallow (if able) to facilitate advancement of the tube. Offer the patient water to drink if appropriate (Only if the head is not restrained and suction is ready)
- If cervicle spine injury is not suspected, the patient may be asked to flex the neck toward the chin
- If the patient begins to cough, gag, or choke, procedure should be stopped and the patient be given an opportunity to recover. If patient begins to vomit, place in lateral decubitus position
- Continue to pass the tube until the marked spot is reached
- Check tube placement by ascultating over stomach as air is introduced through the tube - or by aspirating gastric contents
- Tape tube in place (Tube may be left open to gravity drainage or may be hooked to suction if ordered)
- Restrain patient as needed to prevent dislocation of the tube
- Document procedure, including tube size, which nare it was placed in, amount of stomach contents aspirated, and the patient's tolerance of the procedure
- The EGTA may be used to facilitate the placement of the NG tube in the unconscious

overdose patient. The tube should be passed as above but through the lumen of the EGTA.

PROCEDURAL PROTOCOL
OXYGEN SATURATION MONITORING
CHAPTER 24.7.14
Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Protocol

- Switch power to the “on” position of the oxyhemoglobin saturation monitor, (or just clip the unit on the finger using the portable devices)
- Place oxyhemoglobin sensor on digit or earlobe of patient; secure to finger with tape if necessary. Avoid attaching sensor to hand or arm where IV has been initiated
- Allow sensor to “capture” pulse and determine oxyhemoglobin saturation (approximately 15-20 seconds).
- In order to ensure that the saturation reading is correct, the patient’s pulse rate obtained from the Pulse Oximeter **MUST** match the pulse manually. If these pulse rates do not match within several beats, the saturation reading you have is incorrect
- Continue to monitor O_2 saturation during transport

NOTE:
Use of the pulse oximeter distal to the blood pressure cuff may give brief inaccuracies when the cuff is inflated.

PROCEDURAL PROTOCOL
STEMI ALERT (ST MYOCARDIAL INFARCTION)
CHAPTER 24.7.15
Issued: May 2010

Revised: Oct 2010, June 2011 Submitted By: Technical Services Approved By: Medical Director

Protocol:

- ST segment elevation, measured at the J-point, of 1 mm or more is considered an abnormal finding. When that elevation is found in two anatomically contiguous leads, it is considered presumptive evidence of acute myocardial infarction (Injury). Patients who display ST segment elevation in two contiguous leads and display symptoms should be transported to one of the listed facilities:
  - Shands at UF
  - North Florida Regional Medical Center
  - Veterans Administration Medical Center of Gainesville
- Paramedics should group the patient with ST elevation in two contiguous leads into one of the following anatomic groups:
  - Leads I,AVL, V5, V6= suspected lateral wall injury
  - Leads II,III,AVF =suspected inferior wall injury
  - Leads V1 thru V4=suspected anterior or septal wall injury
- If the patient displays injury patterns on the 12 lead EKG, the Combined Communication Center (CCC) shall be contacted by the treating paramedic and a **"STEMI ALERT"** issued to the receiving facility as soon as possible.
- The 12 Lead EKG(s) shall be transmitted to the receiving facility as soon as possible to allow EKG review by attending physician in the Emergency Department.

Paramedic Recognition/ of "STEMI" in the Field:

- Criteria for "STEMI Alert"
  - (+) ACS Symptoms
  - (+) Characteristic cardiac presentation
  - (+) 12 Lead ECG Printout
  - (+) ST Segment elevation >1mm in two or more contiguous leads
  - (+) Paramedic interpretation for "STEMI"
- The patient's 12 Lead EKG shall be transmitted to the receiving facility as soon as available. (This may not be available until Rescue Unit arrives)
  - **NO NAMES SHALL BE PLACED ON 12 LEAD EKG**
  - Age and gender are acceptable and needed for accurate interpretation by EKG monitor
  - No other identifiers will be used other than Unit ID and Time/Date stamp generated by EKG Monitor
- En route to the ED, the treating paramedic shall assure the following is completed:
  - Full patient assessment
  - Treatment via appropriate Medical Care Protocol
  - 12 Lead EKG transmitted successfully
  - Radio report given to receiving facility including the following:
    - ***Notification of EKG transmission***
    - Patient status/condition
    - Treatments rendered
    - Current vital signs

Currently there are three hospitals with interventional cath labs

- Shands at UF
- North Florida Regional Medical Center
- Veterans Administration Medical Center of Gainesville

BYPASS of Emergency Department directly to the Cardiac Cath Lab

- Done only at North Florida Regional Medical Center
- Done only if the Cath Lab is staffed and ready for the patient
- Patient must be seen be the attending ED Physician in order to affirm patient's stability and ability to Bypass the ED
- Receiving hospital staff (minimum of an RN) must accompany ACFR personnel to the Cath Lab and assume patient care responsibility within the hospital.
- ACFR crews shall assist the hospital staff within their scope of practice should an emergency event take place during the bypass process
- ACFR crews shall notify CCC when bypassing the ED and proceeding directly to the Cardiac Cath Lab. The Rescue Lieutenant shall place their unit on a 10 minute delayed response.

Situations Not Categorized as STEMI ALERTS:

- Conditions and situations exist which may mask or mimic the criteria for EKG categorization of "injury patterns". Some of these conditions are Left Bundle Branch Block (LBBB), Left Ventricular Hypertrophy (LVH), Pericarditis and Benign Early Repolarization. Examples of these follow:

- *Left Bundle Branch Block (LBBB*) can produce ST elevation in leads V1, V2, and V3. It will also display a QRS of abnormal duration. (>.12 sec) and a QS complex or negative terminal force in V1. Electrophysiology: LBBB alters depolarization (affects QRS), which alters repolarization (affects ST-T wave). Therefore, LBBB can produce changes in the QRS-ST-T waves that are identical to those produced by injury. A BBB widens the QRS (.12 sec or more). This widening is due to the fact that the ventricles are forced to contract sequentially, thus requiring more time. Therefore, when a QRS of .12 sec or more is produced by a supraventricular rhythm, think BBB. This rule applies in all leads. Differentiation of LBBB from RBBB comes from evaluation of lead V1 on the 12-lead ECG. The "classic" pattern of LBBB in V1 is a QS complex or negative terminal force.

Note: ***New onset LBBB with STEMI characteristics will be classified as a STEMI Alert. If Unknown, consider it new onset.

- *Left Ventricular Hypertrophy (LVH)* can produce ST elevation in leads V1, V2, and V3. The formula to use to look for LVH is as follows:
  - Compare V1 and V2 and determine which lead has the deepest S wave. Then determine the depth of the deepest S wave.
  - Compare V5 and V6 and determine which lead has the tallest R wave. Then determine the depth of the R wave.
  - Add the height of the R wave and the depth of the S wave. If the number is > 35mm suspect LVH (each box = 1 mm).

Electrophysiology: There are many causes of LVH. Most are the result of either the left ventricle working harder over a long period of time or the result of chronic overfilling. For ACS management, it is NOT critical to determine the cause of the LVH. Simply suspecting the presence of LVH is sufficient. LVH can mimic "injury" patterns on the 12-Lead EKG. Unlike BBB, LVH does NOT usually widen the QRS to .12 sec or more. Instead of abnormally widening the QRS, LVH increases amplitude. LVH can produce ST segment elevation in early V leads.

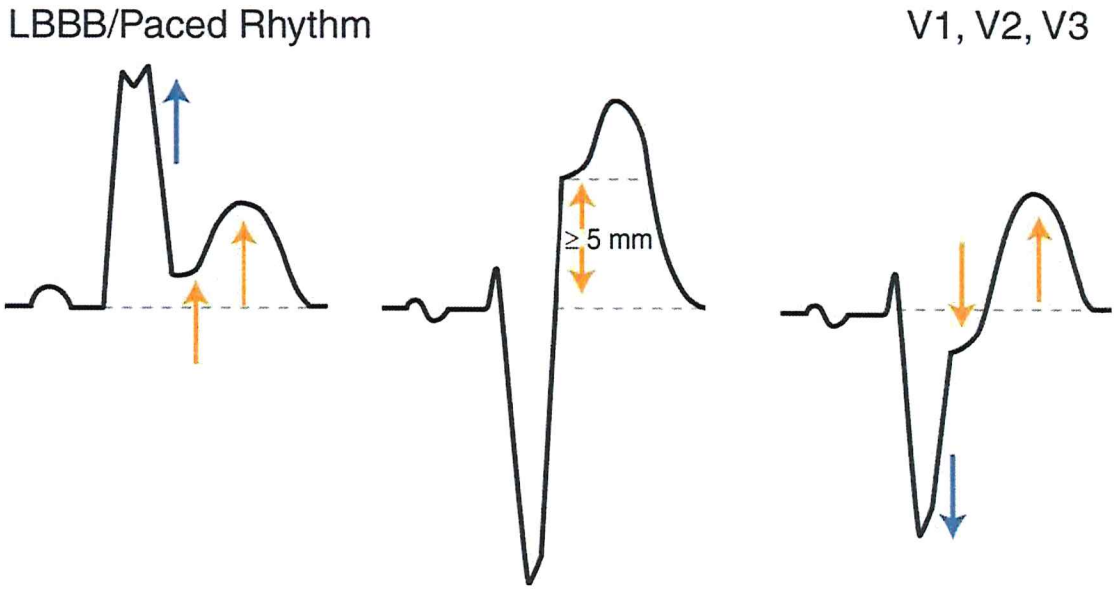
- *Pericarditis* -There are numerous causes of pericarditis. These patients often complain of chest pain, which is an indication for a 12-Lead EKG. Pericarditis is capable of producing

diffuse ST segment elevation across the EKG. The ST segment elevation of pericarditis is caused by inflammation of the epicardium secondary to inflammation of the pericardium. This process is not related to coronary artery disease and, therefore, ST segment changes do not tend to follow anatomical groups typically seen with AMI. Pericarditis may produce notching of the J-point and a “fish hook” shaped ST and J-Point. The “classic” pericarditis presentation has some distinguishing features. Listed below are the differentiating characteristics of AMI vs. Pericarditis. The purpose is not to rule out AMI, but help the care provider suspect the possibility of pericarditis.

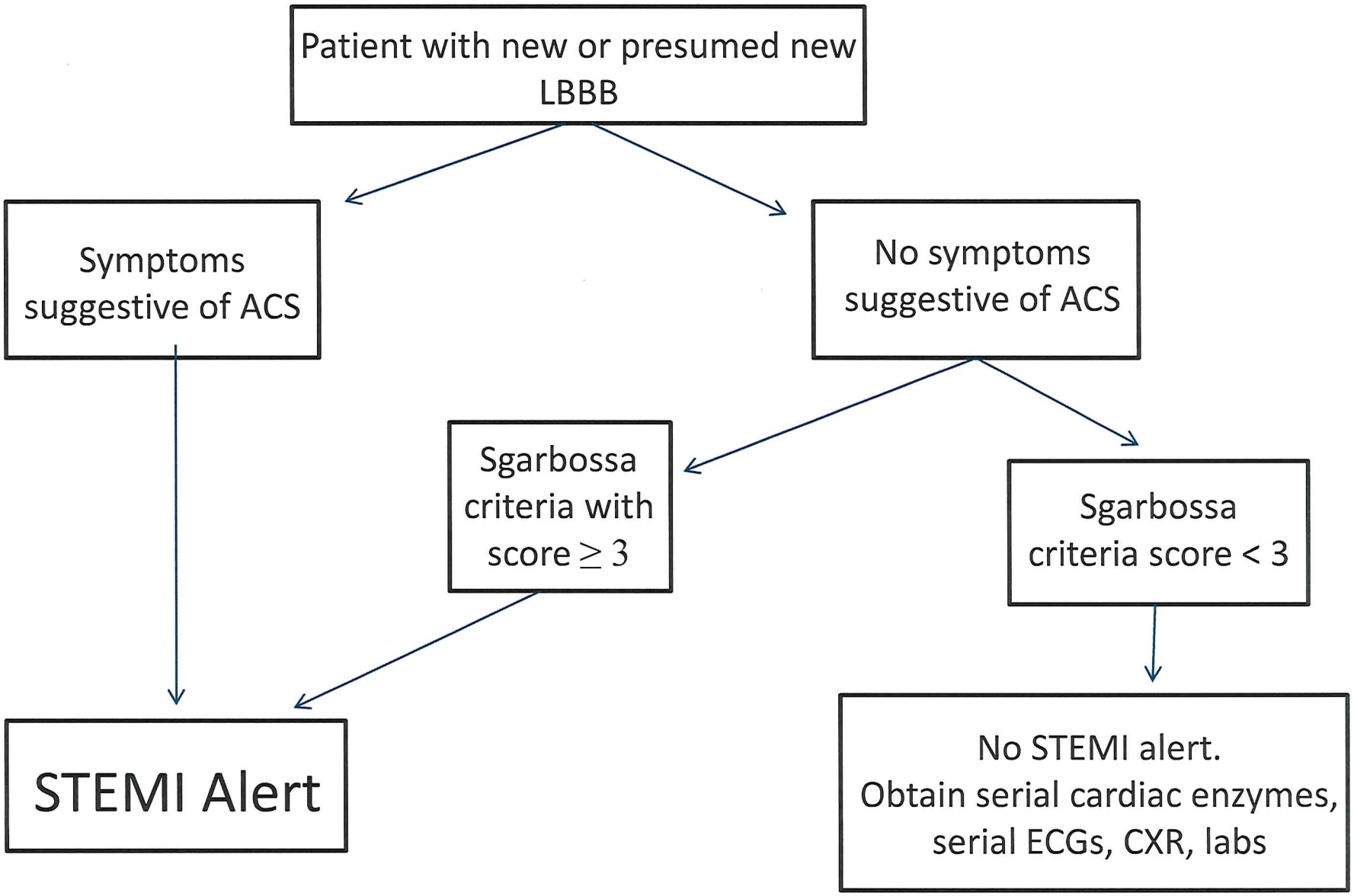
- *Benign Early Repolarization* can produce ST elevation in the anterior or anteriolateral leads and tall T waves. In some respects it closely resembles pericarditis on the 12 lead EKG with notching of the J point. Electrophysiology: It has been theorized that the cause of Benign Early Repolarization is due to one region of myocardium repolarizing early. This produces a difference in electrical potential, and thus causes ST and T wave changes. Changes can occur in any lead. But are more common in the lateral and anterior chest leads. Benign Early Repolarization, like pericarditis, may produce notching of the J-point and a “fish hook” shaped ST and J-Point. Patients with Benign Early Repolarization often meet the voltage criteria for LVH. However, no true hypertrophy may exist. Anyone, male or female, of any ethnic background can have this pattern on his or her EKG. However, this pattern is most commonly seen in young adult African-American males.

Sgarbossa's Criteria

Criteria for diagnosis of MI	Points
ST elevation > 1mm concordant (same direction) as QRS	5
ST depression > 1mm in leads V1, V2, or V3	3
ST elevation > 5mm and discordant (opposite) with QRS	2
Total > 3 is 36-78% sensitive and 90-96% specific for acute MI	



LBBB Guideline



Above recommendations meant to serve as a guideline, are not appropriate for every patient, and are not a substitute for a physician's clinical judgement.

PROCEDURAL PROTOCOL
VENTILATOR
CHAPTER 24.7.16
Issued: May 2010

Revised: March 2014 Submitted By: EMS Branch Approved By: Medical Director

Procedure:

Newport HT 70 Plus Transport Ventilator
Turn on ventilator
Attach circuit to ventilator
Perform circuit check before continuing
Make Sure "Blue" tile in lower right hand corner reads **TRANS**
If transport will be > 1 hour, bring humidifier with patient.

Protocol:

Ventilator Transport
Review transfer paperwork
Meet with Respiratory Therapist and RN in charge of patient

- Auscultate patients breath sounds
- Assess security of ETT placement (if not secure with Thomas Tube holder)
- View and document tube size and placement at teeth
- Estimate oxygen needed and plan ahead with extra O_2 tanks if necessary
- Review and document patient's ventilator settings.
- Vital signs every 15 minutes for a stable patient with transport time > 1 hour, every 10 minutes for local transport and every 5 minutes for an unstable patient local transport.

Document ventilator setting on ACFR Ventilator settings form

Set Ventilator Parameters to the same settings the patient is currently receiving.

- Additional Equipment Needed for Ventilator Transfer
- SPO2 monitor with Capnography
- Cardiac monitor
- Full O2 bottle
- Suction
- Kelly Clamp

Transfer of patient to ACFR Ventilator
Patient should be placed on ACFR Vent prior to being moved to transport stretcher.
This will allow patient to be acclimated to ACFR Vent. If adjustments need to be made, make them one at a time.

REMEMBER; OCCLUDE ET TUBE WITH KELLY CLAMP ON EXPIRATION WHEN READY TO

SWITCH VENTILATORS IF PEEP >10. REMOVE KELLY CLAMP AFTER BEGINNING VENTILATONS WITH HT70.

Consider transporting patient with inline suction attached to reduce loss of PEEP.

INFECTIOUS PATIENTS: Remember to do circuit check before applying filters.
Obtain bacteriostatic filter from hospital staff and apply between ventilator and circuit.
Place N95 mask at exhalation port on circuit.
Clamp ET Tube with Kelly clamp just before exhalations starts.
Place patient on ACFR vent circuit, begin ventilations, remove Kelly clamp.

SETTINGS (Adult)
These are parameters to use should changes be necessary on the ventilator for patient comfort.

- RR = 8 – 16 (Watch ETCO2)
- PEEP = 5 – 10 (to keep the alveoli inflated and prevent atelectasis
- PS = 10 – 20
- Flow = 30 – 40 *****Watch I-time*****
- I-time 1 – 1.5 sec. for adults, 1.0 sec. for toddlers, 0.5 sec. for infants 1yr and less (how long the inflations of the ventilation is held)
- Tidal Volume (Vt) 6 – 8 L x KG
- P –trig = set at 2 (amount of pressure from the patient it takes to initiate a breath), (If ventilator is auto cycling, it may be necessary to increase P-trig to 4)
- If patient is not tolerating the ventilator it may be necessary to change settings (one at a time) or alarm adjustments may need to be made

BVM

Many conscious/alert patients that are being transferred from hospital vents to transport vents will experience agitation. It is important to advise patient of the challenge of adjustment and to relax. **BE PATIENT!!!!** There are physiological reasons for patients to become agitated including: pain, hypoxia, fever, and nervousness about transfer.

Rule out hypoxia

Allow 10-15 minutes for patient to acclimate to Newport HT70, if no change the Paramedic may administer Versed 1-2mg SIVP. Repeat as needed, after ruling out hypoxia. This should be considered in patients whom are not already on sedation.

Remember to complete the “Settings for mechanical Ventilation” form on all patients where the Newport HT70 Ventilator is used. Form will need to be scanned and attached to the Patient Care Report.

SETTINGS FOR MECHANICAL VENTILATION
NEWPORT HT70 PLUS

SETTINGS FOR MECHANICAL VENTILATION
NEWPORT HT70 PLUS

Patient Name:_____ **CR#:**_____

CURRENT VENTILATOR SETTINGS		
MODE: [ ] A/CMV **[ ] SIMV** **[ ] Spontaneous/BiPAP**		**[ ] Volume Control** **[ ] Pressure Control**
Tidal Volume (V_T)	**Resp Rate (RR)**	**Flow**
Pressure Control (PC)	**I – time**	**Pressure Support**
PEEP	**P_{trig}**	**Flow $_{trig}$**
Fi O_2 %	**IPAP (BiPAP) PS**	**EPAP (BiPAP) PEEP**

ET Tube or Trach Tube (circle one)

ET Tube Size: _____

Depth (measured at teeth): _____

How secured? _____

Nurse or Resp. Therapist Signature: _____

Place patient, while still in hospital bed, on HT70 after setup to allow patient to become acclimated to ACFR ventilator. Remember to clamp ET Tube with Kelly clamp just before expiration if PEEP > 10, attached ACFR circuit and unclamp after starting ventilation with HT70.

PLEASE REMEMBER TO SCAN AND ATTACH FORM TO REPORT.

PROCEDURAL PROTOCOL
ZOLL® E SERIES™ REFERENCE GUIDE
CHAPTER 24.7.17

Issued: May 2010

Revised: June 11, Aug 11 Submitted By: Technical Services Approved By: Medical Director

Universal Dial (Central Control Knob)
- One universal dial is used for all therapies (defib/monitoring/pacing). Turn the dial to the therapy you wish to use. Additional options will appear at the bottom of the screen. Soft keys will be used often and the options at the bottom of the screen will change based on which therapy you are utilizing.

Defib (ALS) (biphasic is 200J for each shock)
- #1 Turn Central Control knob to **DEFIB** (Red)
- #2 Press **CHARGE**
- #3 Press **SHOCK**
- Pediatric - 2 J/kg 1st Shock -> 4 J/kg 2nd and subsequent shocks (See Broselow Tape)
  - You will need to manually set the Joule settings for Pediatric patients
  - The default setting is 200J

Cardioversion
- Turn Central Control knob to **DEFIB** (Red)
- Press **SYNC ON/OFF** soft key
- White arrows will sync on "R-wave"
- Energy Settings are:
  - SVT : 50 to 100 à 120 à 150 à 200 Joules
  - Atrial fibrillation/Flutter: 50 to 100 à 120 à 150 à 200 Joules
  - Wide Complex Tachycardias: 50 to 100 à 200 à 300 à 360 Joules
- Pediatric- 1 J/kg 1st dose -> 2 J/kg 2nd dose (See Broselow Tape)
- ****You must manually select the energy you wish to use. The energy will not automatically increase once manually changed****
- Press **CHARGE** à Push and hold **SHOCK** to shock on "R-wave"
- **You must press SYNC ON/OFF key between each cardioversion attempt**. It is automatically turned off when charge is delivered in case of rhythm change to VFib

Pacing
- Turn Central Control Knob to **PACER** (Green)
- Turn Pacer Output (mA) until "QRS" appears after each pacer spike (**Electrical Capture**).
- Confirm mechanical capture by checking Carotid and/or Radial pulse.
- Once you get mechanical/electrical capture, increase the current by 10% to make sure you don't lose capture.
- Set the Pacer at 20-30 ppm higher than the patient's intrinsic rate. Default pacer rate is 70 ppm. **Do not exceed 80 ppm**
- Turn the Pacer Rate dial to change the patients heart rate
- Press and hold the 4:1 button to view the underlying rhythm (Not recommended)

Blood Pressure (NIBP)
- Select proper cuff size and apply to patient, making sure that the cuff is tight and properly aligned.
- Press blue **NIBP** button to take a single pressure. The cuff will inflate to 180, if a pressure is not obtained at 180, the cuff will re-inflate until a pressure is obtained. Push **NIBP** button

again to abort measurement.
- Push and hold NIBP button to Auto inflate every 5 min. Press and hold again to shut off
- Auto NIBP.
- Change interval – Press "Param" à Enter NIBP à select Auto Interval à Increase or Decrease
- To take a single pressure in between Auto Interval, Press the NIBP button again. This will take a single pressure, but not change your Auto Interval.
- To get a list of all your vitals (Trends), press "Summary" à Trend à It will highlight NIBP à Enter à Print
- You will receive trending of all blood pressures, heart rate, SPO_2, and $EtCO_2$.

12-Lead ECG
- Turn Central Control to "Monitor" and make sure Lead II not PADS is displayed.
- Prep patients skin as appropriate and attach 4 Lead cable to torso à Press and hold the recorder button to print leads I, II, III, aVR, aVL, aVF à Connect V leads to chest à Plug V lead cable into 4 lead cable block. Press and hold the RECORDER button to obtain a quick look real time 12-lead.
- Press 12 Lead à PT Info à Gender (m/f) à Age à Press arrows on top of monitor & Enter à Return à Return again
- Make sure patient is still for a full 10 seconds when acquiring. à Press Acquire

12 Lead Transmission
- After 12 lead has been performed, monitor will be in EKG Transmission mode
- Select transmission destination (Hospital Choice or TEST)
- Press "Transmit Now" when in proximity of mobile router located in unit

$ETCO_2$
- Plug the ETCO2 adapter (clear piece) into the ETCO2 module and place airway adapter between ET tube and BVM
- The CO2 module takes about 1 min. to warm-up after you turn on the monitor and should already be zeroed.
- If you have to re-zero, place the sensor into the module à Press Param (soft key) àSelect ETCO2 à Enter à Press Zero. Make sure nothing is attached to the patient when re-zeroing
- Press soft key labeled **Wave 2** to view the wave form

Lead Button
- Your monitor will "power up" in Lead II. You may press the "Lead" button to change leads

Recorder Button
- Press "Recorder" button once to print what you see on the screen. Press "Recorder" button again to stop printing.
- Press and hold "Recorder" button with 4 Lead cable and it will print I, II, III, aVR, aVL, aVF in Diagnostic Mode.
- Press and hold "Recorder" button with 12 Lead cable and it will print a Diagnostic 12 lead with no interpretation

Code Markers
- Press the Code Marker button, you will see a list of drugs that follow protocols à Press Enter Marker
- Once you press the Enter Marker it will automatically highlight the next drug in your protocol. To move through the list of drugs use the arrows on top of the monitor. If you deviate from the protocol use the arrows on top of the monitor to move through the list.
- If you want to mark a generic event, press the Code Marker button once

Printing a Summary
- There are three main uses in the Summary section

- Trend: (see NIBP above)
- Print Chart à Print Range: allows you to print a range of events. A log of events will appear on screen. Use arrow keys to scroll down to highlight the first event that you want to print. Press “Print Record”. Allow the machine to print off the information you want, press “Record” to stop recorder.
- Printing a complete summary: press “Summary” à Print Call à Select Call with arrows on top of the monitor à Print Record

Shift Check - Do in the following order

- Rotate Batteries 1. Unit to Charger 2. Spare to Unit 3. Charger to Spare (this should be done daily)
- Plug red end of defib cable into the black test port that is attached to the cable. Turn central dial to red (Defib). Select 30 Joules à Press Charge à Press Shock à “Test OK” will appear on screen. If you get an “Error code” contact the Duty Supervisor.

Adjusting the Screen for Bright Light

- Press and hold the button in the lower left that is a half shaded circle

Uploading Data into Tablet PCR

- Information to be released in the future

Battery and Charger Maintenance

- Batteries need to be conditioned once a month
- This should be done on the first day of every month when expired drugs are checked
- Notate battery conditioned with date and initials/id # on the tag on the side of the battery
- Charger should be tested every 3rd month (quarterly)
- Notate the charger test on the tag on the charger with date and initials/id #

PROCEDURAL PROTOCOL
SEPSIS ALERT WITH LACTATE SCOUT

CHAPTER 24.7.18

Issued: March 2013 Revised:

Submitted By:EMS Branch Approved By:Medical Director

Purpose:

To actively assist in the early identification of SIRS/Sepsis patients to decrease morbidity and mortality.

Background:

Systemic Inflammatory Response Syndrome, (SIRS) refers to the inflammation that is the body's response to a nonspecific insult, consisting of a complex cascade of events. SIRS can be caused by ischemia, inflammation, infection, trauma or a combination of insults. Sepsis is the systemic response to infection with presence of SIRS, with a documented or presumed infection.

SIRS is defined as two or more of the following criteria:

- Temperature of less than or equal to 96.8 degrees Fahrenheit or greater than or equal to 100.4 degrees Fahrenheit.
- Heart rate of greater than or equal to 90 beats per minute.
- Respiratory rate of greater than or equal to 24 breaths per minute
- White blood cell count of greater than 12,000 or less than 4,000; or greater than 10% bands (if lab result available)

Common infections include pneumonia, urinary tract infection, cellulitis/abscess (skin infection), or bacterium (blood infection).

Patients whom are immunosuppressed are at a higher risk for developing an infection. These patients may include those with cancer, are on steroidal treatments, have recently undergone a surgical procedure, have indwelling foreign body (Foley catheters, IV line, external fixator), or patients who have comorbidities such as diabetes or bed bound.

A **Sepsis Alert** shall be activated when a patient presents with two or more criteria for SIRS listed above plus a systolic blood pressure less than 90mmhg or signs of end organ damage.

Signs of end organ damage include:

- Neurological changes (altered mental status, coma, agitation or lethargy)
- Respiratory changes (hypoxia, dyspnea)
- Circulatory changes (poor capillary refill, ECG changes, pulmonary edema)
- Renal changes (decreased urination, an acute rise in creatinine)

Procedure:

Basic Life Support

- Perform a full history and physical assessment searching for evidence of infection.
- Ensure patent airway
- Apply supplemental oxygen if any respiratory signs or symptoms present with an oxygen saturation less than 94%
- Record and monitor vital signs
- BGL

Advanced Life Support

- Advanced airway (if needed)
- 12 Lead ECG
- IV and if evidence of dehydration and hypotension, administer 250 ml bolus. Repeat if necessary, until systolic pressure reaches 100 mm Hg. Withhold bolus in patients who present in CHF (presence of rales, rhonchi or crackles).
- Continuous monitoring of non-invasive ETCO2

A Sepsis Alert may also be called based on Paramedic Discretion.

*** Alachua County Fire Rescue and Shands Health Care have entered into a research partnership in obtaining Lactate Levels for patients that are suspected to be Septic. The Lactate Scout Monitor is not FDA approved, cannot be utilized to diagnose Sepsis and will only be utilized for research purposes. A Lactate Level shall be obtained for all patients who meet the criteria for a Sepsis Alert. This value SHALL NOT be passed onto the receiving facility. It will be documented in the EMS Run Report for research purposes only.

PROCEDURAL PROTOCOL
ZOLL® AUTOPULSE BATTERY CONDITIONING

CHAPTER 24.7.19

Issued: March 2013 Revised:

Submitted By: EMS Branch Approved BY: Medical DIrector

About this Procedure:

The information in this User Guide applies to the ZOLL Circulation AutoPulse® Battery Charger designed for the AutoPulse Resuscitation System Model 100. The AutoPulse Power System consists of two main components: the AutoPulse Battery Charger and the AutoPulse Battery.

Proper use of the AutoPulse Power System requires a thorough understanding of the Power System, and appropriate training and practice using the Power System.

Always charge a stored Battery before placing the Battery in active operation. Battery may self-discharge when not in use. Failure to charge a Battery before use may cause device power failure.

Introduction of the AutoPulse Power System:

The AutoPulse Power System represents a state-of-the-art breakthrough in battery technology and one of the breakthroughs that make the AutoPulse Resuscitation System possible. The AutoPulse Battery communicates with the AutoPulse Battery Charger or with the AutoPulse Platform when it is plugged into each respectively.

The Battery is intended to operate for a minimum of 30 minutes at a rate of 80 compressions per minute.

The Battery uses a lithium ion (Li-Ion) technology because Li-Ion delivers one of the highest power outputs of any battery technology. At the same time, Li-Ion does not have the limiting memory effect inherent with nickel-cadmium (NiCd) batteries or the higher weight associated with the higher mass-to-power ratio of lead-acid batteries. The Battery automatically monitors its readiness state. Finally, the Battery is mechanically keyed to the AutoPulse Platform and Battery Charger to facilitate correct installation.

Checking the Battery's status allows you to determine the need for a charge to ensure adequate battery capacity (run time). A green LED ensures that the Battery has the capacity for a minimum run time of 30 minutes on a typical patient. Batteries self-discharge when not in use. Recharge the Battery before use if the amber LED illuminates.

Performing a Battery Status Check:

To determine if an AutoPulse Battery needs to be charged, press the white Status Check button on the Battery.

Green LED – Battery charged and ready for use.
Amber LED – Battery is partially discharged and remaining runtime is unknown.
Red LED – Battery has exceeded its service life or failed a test-cycle.

When a Battery is in the Battery Charger and the READY LED illuminates, leave the Battery in the Battery in the Battery Charger to maintain peak capacity.

Battery Charger Status LEDs:

Yellow LED – Battery is charging.
Yellow LED on Charger and Amber on Battery – indicates that battery is in the Test-Cycle mode. Test/Cycle last approximately 12 hours. At completion of the Test-Cycle the Battery Charger will indicate READY or FAIL.
Green LED – Battery is charged and ready to use.
Red LED – Battery has failed or the Battery Charger is currently unable to charge the Battery. Try reinserting the battery again. If **Red LED** still illuminates then battery has failed and needs to be replaced.

Understanding Test-Cycles:

A test-cycle measures the Battery's charge holding capability by cycling the Battery through a charge- discharge-recharge sequence. Batteries with a high charge holding capability pass the test cycle and remain available for continued use. Batteries that no longer accept a charge will fail the test-cycle and must be replaced as they can no longer be used in the AutoPulse System.

Note: The AutoPulse Battery Charger will automatically perform a Test-Cycle every 10th charge/discharge cycle or at a minimum of every 30 days. When a battery is placed in the battery charger under those conditions, the Test-Cycle Yellow LED will illuminate and the charger will automatically begin the Test-Cycle. The normal Test-Cycle requires up to 12 hours and the battery cannot be removed during the Test-Cycle. Documentation will be noted on the Battery Test-Cycle attached to the bottom of each Battery.

The Battery Charger will automatically perform a test-cycle:
• Every 10th charge/discharge cycle.

• When the Battery Charger detects that the Battery has been severely discharged (no status LEDs will illuminate when you press the Battery's Status Check button).

Note: Do not remove a Battery during a test-cycle or the Battery's runtime will be unknown.

Removing a Battery during a test-cycle may cause the Battery Charger to automatically enter a test-cycle mode the next time a Battery is inserted into the Battery Charger.

At the end of one full test-cycle, if the Battery Charger's TEST (amber) LED remains illuminated, the Battery Charger has determined that the Battery's charge capacity remains compromised. In an attempt to restore the Battery, the Battery Charger will perform a second test-cycle (another six hours). If the Battery Charger's TEST LED remains illuminated, the Battery Charger will attempt to perform a third test-cycle (another six hours). Following the third test-cycle, the Battery will either be ready for operation (green READY LED illuminated) or the Battery will have failed the test-cycle and must be replaced (red FAIL LED illuminated).

A Battery will fail a test-cycle following 100 charge-discharge cycles.

Note: Discontinue use of any failed Battery as it will no longer hold an appropriate charge. Notify the appropriate District Chief so that a replacement Battery can be obtained.

Battery Management:

The AutoPulse System is intended to be deployed on emergency vehicles in a state of high-readiness. Therefore, regular AutoPulse System checks should be integrated into Emergency Medical Service (EMS) rig-check procedures. Regular monitoring of AutoPulse Battery status is vital to ensure adequate run time. Discharged Batteries (amber status light-emitting diode (LED) on the Battery or less than four bars seen on the AutoPulse Platform's display panel screen when the AutoPulse Platform is powered up) will result in shorter Battery run times. Discharged Batteries should be replaced with charged Batteries (green status LED or four bars seen on the AutoPulse Platform's display panel screen).

The following essential elements of AutoPulse Battery management should be incorporated into a regular routine:

• Leave a fully-charged Battery installed in the AutoPulse Platform at all times.

• Leave a fully-charged spare Battery in the case that carries the AutoPulse System.

• Maintain one fully-charged Battery in the AutoPulse Battery Charger.

The Battery rotation preformed at the beginning of each shift is;

• Battery in Battery Charger becomes the spare.
• Battery that is spare in case goes into the AutoPulse platform.
• Battery in AutoPulse Platform goes into the Battery Charger.

PROCEDURAL PROTOCOL
ZOLL® AUTOPULSE® MODEL 100
CHAPTER 24.7.20

Issued: March 2013 Revised:

Submitted By: EMS Branch Approved By: Medical Director

Indication for Use:

The AutoPulse is intended to be used as an adjunct to manual CPR, on adult patients (> 18 years of age) only, in cases of non-traumatic cardiopulmonary arrest defined by a lack of spontaneous breathing and pulse.

Description of the System:

The AutoPulse is an automated, portable, battery-powered chest compressor, which provides chest compressions as an adjunct to performing manual CPR. Use of the AutoPulse is intended to reduce the impact of rescuer fatigue and will enable the rescuer to address additional patient needs.

AutoPulse Platform:

The AutoPulse Platform contains the mechanical drive mechanism, control system, and electronics necessary to generate and control the force required to perform mechanical chest compressions. User controls and indicators are contained in the User Control Panel.

LifeBand Load-distributing Band (LDB):

The LifeBand is a load-distributing band (LDB) that consists of a cover plate and two bands integrated with a compression pad with a Velcro® fastener. Attached to the AutoPulse Platform, the LifeBand is automatically adjusted to the patient and provides compressions to the patient's chest in the region of the heart. The latex-free LifeBand is a single-use component that is attached to the AutoPulse Platform before each use.

AutoPulse Power System Battery:

The AutoPulse Battery is a removable component that supplies power for the AutoPulse operation. The Battery is a proprietary, rechargeable, Lithium Ion (Li-Ion) battery that is the exclusive power source for the AutoPulse.

The Battery is mechanically keyed to the AutoPulse Platform and Battery Charger to facilitate correct installation. The Battery's back end contains connections for power and communications to the Battery Charger and to the AutoPulse Platform. A Battery Status Check button illuminates the Battery's status light-emitting diodes (LEDs).

Using the AutoPulse:

Before deploying the AutoPulse, note the following warnings and precautions:

Warning:

- The AutoPulse is intended for use on adults, 18 years of age or older.
- The AutoPulse is not intended for patients with traumatic injury (wounds resulting from sudden physical injury or violence).
- When CPR is indicated, manual compressions should be initiated immediately, while AutoPulse is prepared for application.
- The AutoPulse must be used only in cases that manual CPR would normally be initiated.
- Personnel certified in manual CPR must always be present during the AutoPulse operation.

Caution: Use care while using sharp instruments around the LifeBand.

Caution: Do not block the vents of the AutoPulse Platform.

Deploying the AutoPulse System:

In order to deploy the AutoPulse quickly and with the least interruption in cardiac compressions, a pit crew model - similar to that which is used in auto racing - is suggested for roles and positions of the staff involved in performing defibrillation and using the AutoPulse.

CPR must be initiated and interruptions kept to a minimum when deploying the Auto Pulse.

1. Power up the AutoPulse. The ON/OFF button is located on the top ("head") edge of the AutoPulse Platform.
2. The AutoPulse illuminates the green Power light-emitting diode (LED) on the User Control Panel and performs a self-test. Refer to the User Control Panel and its display panel during the operation of the AutoPulse. All operating information is available on the User Control Panel.

NOTE: Make sure that no User Advisory, Fault or System Error messages display.

3. The AutoPulse indicates that it is ready for use.
4. After assessing the patient's condition and monitoring pads are in place, sit the patient up and remove the remainder of the upper torso clothing.
5. Slide the AutoPulse Platform into position behind the sitting patient and lay the patient down onto the Platform.
6. Position the patient so that he/she is centered laterally (from left to right) and that the armpits are aligned with the AutoPulse using the yellow line positioning guides on the platform.
7. Close the LifeBand around the patient's chest.

To properly align the two sides of the LifeBand:

a. Place band with yellow alignment tab on top of patient's chest.
b. Locate mating slot of the other band placing it over the alignment tab.
c. Press the bands together to engage and secure the Velcro® fastener
d. Lift up the LifeBand to its fullest, ensuring that the side bands are at a 90 degree angle to the platform, that they are not twisted and that there are no obstructions.
e. Center the LifeBand on the patient's chest, placing it such that its center is over the area upon which manual compressions are conducted.

NOTE: If the bands cannot be closed or any other difficulty with the device is found, continue with manual CPR.

Starting Chest Compressions:

1. Make sure that the yellow upper edge of the LifeBand is aligned with the patient's armpits, and is directly over the yellow line on the AutoPulse Platform. Also make sure that there are no obstructions, such as clothing or equipment, with the bands.
2. Press and release the Start/Continue button once. The AutoPulse automatically adjusts the bands to the patient's chest.
3. The AutoPulse will pause for 3 seconds to allow you to verify that the patient is properly aligned and that the LifeBand has taken up any slack in the bands. (indicated on the Display Panel Screen)

NOTE: If the patient is not properly aligned, press the Stop/Cancel button, realign the patient, and begin compressions again.

4. After the 3 second pause to verify patient alignment is complete, compressions will automatically begin. You may press the Start/Continue button to immediately initiate compressions ahead of that time.
5. **WARNING:**

- **Do not lean on the patient after pressing the Start/Continue button.**
- **If you must move or realign the patient, you must press the Stop/Cancel button before adjustment.**
- **Do not place your hands or any objects on or under the LifeBand while the AutoPulse is analyzing the patient or during active operation.**

6. The pre-set mode compression operation will be Continuous Compressions. In the Continuous Compression mode, it performs compressions with no pauses. In Continuous mode, an audio cue tone for ventilation will sound 8 times per minute.

7. To access the patient or to pause the AutoPulse for any reason, press the Stop/Cancel button. The AutoPulse Platform releases the tension on the LifeBand, allowing the user to pull the bands to the maximum extended position. 10 seconds after the Stop/Cancel button has been pressed a single audio alert tone will sound. Three audio alert tones will sound 20 seconds after the pause was initiated. Audio alert tones will sound continuously after 30 seconds into the pause.

NOTE: Opening the bands during active operation will cause the AutoPulse to stop operation immediately. To restart compressions, re-fasten the Velcro® fastener, clear the Fault by pulling up on the LifeBand and pressing Start/Continue and then follow the normal operating steps.

8. To restart compressions, press the CONTINUE button.

Ending Active Device Use:

1. After either successful resuscitation or termination of activities, press the Stop/Cancel button followed by the ON/OFF button. The Stop/Cancel button action will cease the compression cycles and relax the LifeBand. The ON/OFF button action will power down the AutoPulse.

2. Open the Velcro® fastener and lift or log roll off the patient from the AutoPulse Platform, as necessary.

Preparing the AutoPulse for Its Next Use:

1. Remove the LifeBand from the AutoPulse Platform.
2. Discard the LifeBand as it is a single-use component. Treat the LifeBand as contaminated medical waste and dispose of it accordingly.
3. Clean the AutoPulse Platform before its next use.
4. Replace the LifeBand before returning the AutoPulse to service.
5. Remove the AutoPulse Battery.

NOTE: Ensure that the AutoPulse is powered down before removing and replacing the Battery.

6. Replace the Battery with a fully charged Battery before returning the AutoPulse to service.
7. Recharge the used Battery as necessary for future use.

Periodic Electrocardiogram (ECG) Monitoring and/or Defibrillation/ETCO2:

When the AutoPulse is used in conjunction with defibrillators or with other therapeutic devices that must monitor an ECG signal or to continuously evaluate to determine when ROSC has occurred (ie jump in ETCO2 level ex- 10-20), interruption of the compression cycles may be required to avoid ECG motion artifact associated with mechanical chest compressions, need for

defibrillation and/ or determine if ROSC has occurred.

To temporarily interrupt the AutoPulse's active operation, press the Stop/Cancel button.

To restart the AutoPulse press the Continue button.

Patient Alignment and Securing for Transport:

WARNING: The AutoPulse is not intended for carrying or transporting a patient. The AutoPulse should be placed on the soft stretcher to carry or transport the patient, if necessary. During transport, regular checks of the patient's alignment should be performed.

The AutoPulse does not require any patient restraints to perform compressions while the patient is lying on a flat surface. However, patient restraints should be used to maintain alignment of the patient to the AutoPulse.

- If the AutoPulse cannot be set on a flat level surface
- If the AutoPulse is used during extrication or during transport

The AutoPulse is designed to accept standard restraints to maintain patient alignment. The rescuer can secure a patient of up to 300 pounds, chest circumference not to exceed 51.2 inches or chest depth not to exceed 15 inches.

Caution: Motion can cause the patient to shift and restraints to loosen, so care should be given to the initial strapping for alignment of the patient to the AutoPulse. Regular checks of patient alignment to the AutoPulse and alignment of the LifeBand to the patient's mid-axillary line should be made if the AutoPulse is performing active compressions, or before active compressions are restarted.

When transporting the patient, lift by supporting the patient and the AutoPulse onto the stretcher utilizing the soft stretcher and place the AutoPulse and patient within the vehicle during AutoPulse operation. Secure the AutoPulse and patient to the stretcher.

Caution: Straps or restraints used for transportation purposes must not interfere with the operation of the AutoPulse. Specifically, straps across the patient's chest may restrict the compression/ decompression of the chest. In general, strapping schemes must not alter the alignment of the patient to the AutoPulse.

Remember to attach the included combination AutoPulse Shoulder Restraint/Head Immobilizer before moving.

1. Attach the Shoulder Restraint to keep the patient properly aligned on the AutoPulse Platform, therefore making for easier transport.
2. The Head Immobilizer assists in keeping the patient's head from moving, especially when combined with a cervical collar. A cloth may also be placed under the patient's head.
3. When lifted, the Soft Stretcher has a cradling effect that helps maintain alignment of the patient on the AutoPulse. Users can also allow the patient's lower legs to bend freely at the knees, facilitating moving around tight corners, elevators, and stairwells.

Always ensure the following:

1. Make sure that the patient's armpits and the upper edge of the LifeBand are aligned with the yellow line on the AutoPulse.
2. Make sure that the LifeBand is not twisted and properly mated with the Velcro®.
3. Maintain the LifeBand at 90 degrees with the AutoPulse Platform. Ensure that the LifeBand is not impeded by anything such as the patient's arms, clothing, straps, and buckles that may interfere with the movement of the LifeBand.

AUTOPULSE DAILY BATTERY ROTATION AND CHECKOFF

Batteries for the AutoPulse will be rotated on a daily basis utilizing the following battery rotation procedure.

- Battery in Battery Charger becomes the spare
- Battery that is spare in case goes into AutoPulse platform
- Battery in AutoPulse bag {latform goes into the Battery Charger

Once a new battery from charger is placed in AutoPulse, the AutoPulse needs to be powered on using the ON/OFF button. This allows the AutoPulse to run an analysis of the battery. The screen will advise if the battery needs to be recharged/replaced.

Cleaning the AutoPulse Platform:

1. Remove and dispose of the LifeBand.
2. Wipe all the surfaces of the AutoPulse Platform free of foreign matter and spills with a disinfectant or bactericidal wipe. Check the vents to ensure that they are free and clear of any obstructive matter.
3. Install new LifeBand and ensure that the AutoPulse is dry before storing.

Click to view Flow Chart below

AUTOPULSE PIT CREW DEPLOYMENT

PROCEDURAL PROTOCOLS
KING LTD SUPRAGLOTTIC AIRWAY

CHAPTER 24.7.21

Issued: May 2013 **Revised**:

Submitted By: Technical Services **Approved By:** Medical Director

Indication for Use:

- Patient who is apneic or unconscious without an intact gag reflex, requiring airway management.
- Rescue airway if unable to intubate a patient in need of airway protection.
- Primary airway if intubation anticipated to be difficult and rapid airway control is necessary.
- Primary airway in pulseless arrest, when attempts at intubation are likely to interrupt CPR.

Contraindications:

- Intact gag reflex
- Caustic ingestion
- Known esophageal disease (varicies, alcoholism, cirrhosis, etc.)

Technique:

1. Initiate BLS airway sequence to include pre-oxygenating patient with O_2 via NRBM or BVM as needed.
2. Select the appropriate size King airway based on patient height:
    a. 3’ – 4’ tall = #2
    b. 3.5’ – 4.5’tall = #2.5
    c. 4’ – 5’ tall = #3
    d. 5’ – 6’ tall = #4
    e. 6’ tall = #5
3. Assemble equipment, note correct volume for inflation marked on tube itself, test balloon for leaks, lubricate posterior aspect distal tip with water-soluble lubricant.(included)
4. If trauma, make sure someone is holding in-line spinal immobilization in neutral position.
5. If no trauma, sniffing position or slight cervical hyperextension is preferred.
6. Hold King Tube in dominant hand at the connector. With other hand, open mouth and lift chin.

7. Advance tip under base of tongue, while rotating tube back to midline.
8. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.
9. Using supplied syringe, inflate cuff balloon with correct volume of air (marked on King Tube)

    a. #2 = 25 – 35 mL
    b. #2.5 = 30 – 40 mL
    c. #3 = 45 – 60 mL
    d. #4 = 60 – 80 mL
    e. #5 = 70 – 90 mL

10. Attach BVM, while gently bagging, slowly withdraw tube until ventilation is easy and free flowing.
11. After inflation of the mask, look for signs of correct placement;

- Slight outward movement of the tube on inflation.
- Presence of smooth oval swelling in the neck around the thyroid or cricoid area.
- No cuff visible in the oropharynx.
- Good waveform on $ETCO_2$ monitor
- Positive bilateral breath sounds with adequate chest rise.
- Negative sounds auscultated over the epigastric area.
- Increased oxygen saturation and skin color improvement.
- Change of color on the CO_2 detector.
- Fogging of tube with breathing
- Change of color on the CO_2 detector. (Only to be used if waveform $ETCO_2$ monitor not working or available)

12. After placement is verified, secure tube using available tube holder.
13. Monitor patient for vomiting and aspiration.

Precautions:

- Use with caution in patients with broken teeth, which may lacerate balloon.
- Do not remove a properly functioning King tube in order to attempt intubation.
- If ventilations become compromised with the King tube, including lack of $ETCO_2$ waveform, remove King tube and provide ventilations with a BVM.

PROCEDURE PROTOCOL
CRICOTHYROTOMY / DECOMPRESSION KIT
Chapter: 24.7.22
Issued: April 15 **Revised:**

Submitted By:EMS Branch **Approved By**: Medical Doctor

BACKGROUND:

The Cricothyrotomy/Decompression KITS have been developed to facilitate easy recognition and usage of items necessary to perform decompression (Chapter 24.7.4), surgical and needle cricothyrotomy (Chapter 24.7.6). The KITS are labeled on the outside of the box where each item is located. If the item has an expiration date, it is also listed on the outside of the KIT. This will allow for easy identification without the need to open the KIT except when needed for either procedure. The KIT will have a breakaway seal.

USAGE:

When the KIT is utilized for a cricothyrotomy or decompression, it will need to be replaced with another KIT. Spare KITS will be kept at CSW. You will need to request a replacement KIT on your next order day and the opened KIT must be returned to CSW for restocking and resealing.

CONTENTS:

The KITS contain the following equipment:

ITEM QUANTITY Bougie 1 5.5 ET Tube 1 14ga-1.25in IV Cath 2 14ga-3.25in IV Cath 2 Meconium Aspirator 1 3.0 x15mm Adapter 1 Saline Flush 10cc 1 IV extension Set 1 Scalpel 1 Tracheal Hook 1

There are two (2) needle cricothyrotomy caths. In the event you have to perform a second needle cricothyrotomy before your KIT is replaced, the remainder of the equipment required for a needle cricothyrotomy (meconium aspirator, IV extension set, 10cc saline flusn, and 15mm adapter from 3.0ET Tube), can be obtained from the stock on the rescues.

LOCATION:

KITS are to be located in the Airway Bags.

NOTE:

KITS are not to be opened to utilize the “Bougie”. We are evaluating airway procedures and will consider placement of “Bougies” as an intubation adjunct in the Airway Bags at a later date.

APPENDICIES
PEDIATRIC TRAUMA SCORE
CHAPTER 24.8.1

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

COMPONENT	2 POINTS	1 POINT	-1 POINT
Size	>20 Kg	10-20 Kg	<10 Kg
Airway	Normal	Maintainable	Un-maintainable
Systolic BP	>90 mm HG	90-50 mm Hg	<50 mm Hg
CNS	AWAKE	OBTUNDED	COMATOSE
Open Wound	None	Minor	Major/penetrating

Skeletal

None

Closed FX

Open/multiple FX

(If proper size BP cuff not available, BP can be assessed by assigning 2 points for a palpable pulse at the wrist, 1 point for a palpable pulse at the groin, and –1 point if no pulse palpable.)

I. SIZE: When a given amount of energy is imparted to a smaller child (with less reserve), the potential for severe injury is much greater, so smaller children have high injury potential.

II. AIRWAY: Airway management is more difficult in children because of size and anatomy and the greater difficulty in obtaining a surgical airway when needed, requiring the skills which probably only reside at a trauma center.

III. SYSTOLIC BLOOD PRESSURE: Systolic blood pressure is assessed to provide an initial evaluation of cardiovascular status; “low” blood pressure may reflect normal physiology for a small infant, or reflect Decompensated shock with impending arrest in an older child.

IV. CNS: Level of consciousness is the most important factor in determining neurologic status, and any deviation from totally awake and normal with no history of abnormality demands heightened attention.

V. OPEN WOUND: Any abrasion may reflect internal injury or fracture more often than in adults; certainly, any penetrating injury or major avulsion/laceration may reflect such an injury.

VI. SKELETAL: Children with skeletal trauma are more likely than adults to have associated blunt trauma to the trunk area, and this adds greatly to general morbidity.

The score range is -6 (injured worst) to +12 (injured least).

Studies have shown that no children with PTS of greater than 8 died; though they certainly may have been seriously injured. All children with PTS of less than 1 died. 3% of those who had PTS of 7-8 died. Therefore, any child with PTS of 8 or less should be taken to the highest-level trauma center available.

APPENDICIES
REVISED TRAUMA SCORE
CHAPTER 24.8.2

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

The Revised Trauma Score (RTS) is a standardized method of reporting the severity of injury of the trauma patient in the pre-hospital setting, because of it's reliance solely on objective parameters, it's use is to be preferred to that of the Trauma Score in patient care conducted by ACFR/GFR/ShandsCair personnel.

Parameter **Revised Trauna Score Point**

Glasgow Coma Score: 13-15 4 9-12 3 6-8 2 4-5 1 3 0 **Systolic Blood Pressure** 89 mm Hg 4 76-89 mm Hg 3 50-75 mm Hg 2 1-49 mm Hg 1 None 0 **Respiratory Rate** 10-29/min 4 29/min 3 6-9/ min 2 1-5/min 0 **Total Revised Trauma Score 0-12**

NOTE: A lower Total Revised Trauma Score reflects an increased severity of injury and mandates consideration of patient transport to a trauma center or the closest appropriate facility.

APPENDICIES
PEDIATRIC TRAUMA ASSESSMENT METHODOLOGY
CHAPTER 24.8.3

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

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Pediatric Trauma Assessment Methodology

PEDIATRIC TRAUMA ASSESSMENT METHODOLOGY

The EMT or Paramedic will assess the condition of those injured individuals with anatomical and physiological characteristics of person fifteen (15) years of age or younger for the presence of one or more of the following three (3) criteria to determine the transport destination:

☐ **1)** Pediatric Trauma Triage Checklist: The individual is assessed based on each of the six (6) physiologic components listed below (left column). The single, most appropriate criterion for each components is selected (along the row to the right). Refer to the color-coding of each criteria and legend below to determine the transport destination:

COMPONENT

SIZE	ORANGE, GREEN, YELLOW, WHITE or BLUE BROSELOW ZONE; ≥ 10 Kg (≥ 22 lbs.) ☐ G	RED OR PURPLE BROSELOW ZONE; < 10 Kg (< 22 lbs.) ☐ B	Blank ☐
AIRWAY	NORMAL, SUPPLEMENTED O_2, OR SINGLE TIME SUCTIONING ☐ G	Blank ☐	ASSISTED, INTUBATED, OR MULTIPLE TIME SUCTIONING ☐ R
CONSCIOUSNESS	AWAKE ☐ G	AMNESIA OR ANY RELIABLE HISTORY OF LOST CONSCIOUSNESS ☐ B	ALTERED MENTAL STATUS OR PARALYSIS OR SUSPECTED SPINAL CORD INJURY ☐ R
CIRCULATION	GOOD PERIPHERAL PULSES; SBP > 90 mmHg ☐ G	NORMAL CAROTID OR FEMORAL PULSES PALPABLE; NO PERIPHERAL PULSES PALPABLE SBP 90-50 mmHg ☐ B	WEAK OR NO PALPABLE CAROTID or FEMORAL PULSES; SBP < 50 mmHg ☐ R
LONGBONE FRACTURE	NONE SEEN OR SUSPECTED ☐ G	SINGLE CLOSED LONG BONE FRACTURE SITE ANYWHERE ☐ B	ANY OPEN LONG BONE FRACTURE SITE OR MULTIPLE FRACTURE SITES ☐ R
CUTANEOUS	NO VISIBLE INJURY OR CONTUSION or ABRASION ☐ G	☐	MAJOR TISSUE DISRUPTION[1] OR AMPUTATION[2] OR 2° OR 3° BURNS TO >10% TBSA OR ANY PENETRATING INJURY TO HEAD, NECK, OR TORSO[3] ☐ R

■ R = RED, any **one (1)** - transport as a trauma alert ■ B = BLUE, any **two (2)** - transport as a trauma alert ■ G = GREEN, follow local protocols **3)** Patient does not meet any of the trauma criteria listed above, but was transported to a trauma center due to EMT or Paramedic judgment.

[1]Degloving injuries, major flap avulsions, or major soft tissue disruption

[2]Proximal to the wrist or ankle

[3]Excluding superficial wounds in which the depth of the wound can be easily determined

APPENDICIES
ADULT TRAUMA TRIAGE CRITERIA & METHODOLOGY

CHAPTER 24.8.4

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

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ADULT TRAUMA TRIAGE CRITERIA & METHODOLOGY

ADULT TRAUMA TRIAGE CRITERIA & METHODOLOGY

The EMT or paramedic will assess the condition of those injured persons with anatomical and physiological characteristics of a person sixteen (16) years of age or older for the presence of at least one of the following four (4) criteria to determine whether to transport as a trauma alert. These four criteria are to be applied in the order listed, and once any one criterion is met that identifies the patient as a trauma alert, no further assessment is required to determine the transport destination.

Criteria:

☐ **1.** Meets color-coded triage system (see below)

☐ **2.** GCS ≤ 12 (Patient must be evaluated via GCS if not identified as a trauma alert after application of criterion 1.)

☐ **3.** Meets local criteria (specify): _____

☐ **4.** Patient does not meet any of the trauma criteria listed above but, in the judgment of the EMT or paramedic, should be transported as a trauma alert (document):

COMPONENT		
AIRWAY[1]	± SUSTAINED RR ≥ 30 B	± ACTIVE AIRWAY ASSISTANCE[2] R
CIRCULATION	± SUSTAINED HR > 120 B	± LACK OF RADIAL PULSE WITH SUSTAINED FAST HEART RATE (> 120) OR ± BP < 90R
BEST MOTOR RESPONSE	± BMR = 5 B	±BMR OF ≤ 4 OR ± PARALYSIS OR ±SUSPECTED SPINAL CORD INJURYR
CUTANEOUS	± TISSUE LOSS[3] OR ± GSW TO EXTREMITIES B	± AMPUTATION[4] OR ± $2^0/3^0$ BURNS TO > 15% TBSA OR ± ANY PENETRATING INJURY TO HEAD, NECK, OR TORSO[5] R
LONGBONE FRACTURE	± SINGLE FX SITE DUE TO MVA OR ± FALL > 10' B	± MULTIPLE FX SITES R
AGE	± ≥ 55 B	
MECHANISM OF INJURY	± EJECTION FROM VEHICLE OR ± DEFORMED STEERING WHEEL[6] B	

☐ R = any **one (1)** - transport as a trauma alert ☐ B = any **two (2)** - transport as a trauma alert [1]Airway evaluation is designed to reflect the intervention required for effective care [2]Not just oxygen, [3]Degloving injuries, major flap avulsions (> 5 in.), [4]Amputations proximal to the wrist or ankle [5]Excluding superficial wounds in which the depth of the wound can be easily determined, [6]Only applies to driver of vehicle m: JR/PATTC/6/26/97

APPENDICIES
NORMAL PEDIATRIC VITAL SIGNS
CHAPTER 24.8.5

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

Age Weight (kg) Pulse Respirations B/P

Newborn 3 140 40 80/50 6 months 6 140 30 90/60 1 year 10 120 25 90/60 5 years 20 100 20 100/60 15 years 50 80 14 120/80

(Adult values are applicable from age 15 on)

To estimate **pediatric weight**:
Estimated **wt (Kg) = 2 x (age) + 10**
Example:
For 7 year old child, wt = (2 x 7) + 10 = 24 Kg

To estimate **pediatric endotracheal tube size**:
Use diameter of patient's little finger as gauge of needed tube size; OR

Tube size = $\frac{(16 + age)}{4}$

Example: For 7-year-old child, tube size $\frac{16 + 7}{4} = 5.75$ (Approx. a 5.5 or 6.0 ETT)

Pediatric defibrillation dose:

2 joules/Kg, followed by 4 joules/Kg, followed by 4 joules/Kg

Pediatric major ACLS drug doses:

Epinephrine 0.01 mg/Kg Atropine 0.02 mg/Kg (min. dose 0.2 mg) Lidocaine 1 mg/Kg Dextrose 0.5 - 1 gm/Kg Naloxone 0.4 - 2 mg NaHCO3 0.5 - 1 mEq/Kg Versed 0.1 - 0.5 mg/Kg max 5 mg total

Pediatric Blood Sugar Values

0-2 years: 40-60 gm/dl
2-8 years: 60-80 gm/dl

APPENDICIES
ALTERNATE ROUTES OF DRUG ADMINISTRATION
CHAPTER 24.8.6

Issued: May 2010

Revised: May 13 Submitted By: Technical Services Approved By: Medical Director

The preferred route of drug administration shall be intravenous when not otherwise specified in operational protocols. However, providers must be aware of alternate routes of drug administration and make this information available to base station physicians when difficulties arise in giving required fluids and/or medications.

INTRAOSSEOUS
Any drug given IV may be given via the intraosseous route:

ENDOTRACHEAL
The following drugs may be given via the endotracheal route:

- Naloxone
- Atropine
- Epinephrine
- Lidocaine
- Vasopressin

When drugs are given endotracheally, they should be diluted with 10-15 cc NS prior to administration; administration must be followed by hyper-insufflation of the lungs to promote optimal drug absorption.
Use 2-2.5 X recommended dosage, preferably done by administering through IV tubing past the end of the ETT.

SUBLINGUAL
The following drugs may be given sublingually (injected into the venous plexus at the base of the tongue):

- Nitroglycerin
- Glucose paste
- Zofran

INTRAMUSCULARLY
The following drugs may be administered intramuscularly:

Atropine Morphine sulfate Naloxone Haldol Phenergan Glucagon Toradol Versed Diphenhydramine Furosemide Lidocaine

Use of the IM route is to be highly discouraged due to slow and erratic absorption of drugs from deep IM sites.

INTRANASAL
The following medications can be given Intranasal via the Mucosal Atomizer Device:

- Narcan
- Versed
- Glucagon

TRANSCUTANEOUS
The following drugs may be administered transcutaneous:

- Nitroglycerin paste

APPENDICIES
APGAR SCORING

CHAPTER 24.8.7

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

The Apgar score provides a measure of the well being of the newly delivered infant. It is composed of the parameters of appearance, pulse, irritability (grimace), muscle tone (activity), and respirations. The scores may be from 0 to 10; higher scores are more indicative of neonatal well being. APGAR scores should be determined both one and five minutes after delivery; the five minute score is most significant.

Parameter 0 points 1 point 2 points

Heart Rate 0 <100 100

Respirations absent slow, irregular good, crying

Irritability to slap 0 grimace cry

Musle Tone Flaccid some reflex active motion

Color blue/pale body pink all pink

Total score = sum of each parameter score

APPENDICIES
APGAR SCORING

CHAPTER 24.8.7

Issued: May 2010 **Revised:**

Submitted By: Technical Services **Approved By: Medical Director**

The Apgar score provides a measure of the well being of the newly delivered infant. It is composed of the parameters of appearance, pulse, irritability (grimace), muscle tone (activity), and respirations. The scores may be from 0 to 10; higher scores are more indicative of neonatal well being. APGAR scores should be determined both one and five minutes after delivery; the five minute score is most significant.

Parameter	0 points	1 point	2 points
Heart Rate	0	<100	>100
Respirations	absent	slow, irregular	good, crying
Irritability to slap	0	grimace	cry
Musle Tone	Flaccid	some reflex	active motion
Color	blue/pale	body pink	all pink

Total score = sum of each parameter score

APPENDICIES
APPROVED ABBREVIATIONS FOR DOCUMENTATION
CHAPTER 24.8.8

Issued: May 2010

Revised: Submitted By: Technical Services Approved By: Medical Director

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Approved Abbreviations for documentation

APPROVED ABBREVIATIONS FOR DOCUMENTATION

A

Abd	Abdomen
ABC	Airway, Breathing, circulation
ACLS	Advanced Cardiac Life Support
Adm	Admission
ALS	Advanced Life Support
AMA	Against Medical Advice
ASA	Aspirin
ASCVD	Arteriosclerotic cardiovascular disease
ATLS	Advanced Trauma Life Support
@	At

B

BBB	Bundle e Branch Block
BCLS	Basic Cardiac Life Support
BP	Blood pressure
BS	Breath sounds
BVM	Bag-valve mask

C

C	Centigrade
Ca	Cancer
Ca^{++}	Calcium
CAB	Coronary artery bypass
CAD	Coronary artery disease
Cath	Catheter, catheterization
CBC	Complete blood count
cc	Cubic centimeter
CC	Chief Complaint
CCU	Coronary care unit
CHF	Congestive heart failure
CHI	Closed head injury
Circ	Circulation
Cm	Centimeter
CMS	Circulation, movement, sensation
CNS	Central nervous system
CO_2	Carbon dioxide
COLD/	COPD Chronic obstructive lung disease pulmonary disease
C-spine	Cervical spine
C-section	Cesarean section
CSF	Cerebrospinal fluid
CSM	Carotid sinus massage
CVA	Cerebral vascular accident
CVP	Central venous pressure
CPR	Cardiopulmonary resuscitation

D

DC/dc	discontinue
D & C	Dilation and curettage
Detox	detoxification
DOA	Dead on arrival at hospital
DOE	Dyspnea on exertion
DOS	Dead on scene
DT	Delirium Tremens
Dx	diagnosis

E

ED	Emergency Department
ECG/EKG	Electrocardiogram
EENT/ENT	eye, ear, nose throat
EOA	Esophageal obturator airway
EOM	Extraocular movement
ET	Endotracheal
ETA	Estimated time of arrival
ETOH	Alcohol

F

F	Fahrenheit
FHR	Fetal Heart Rate
FB	Foreign body
FD	Fire Department
Fl	Fluid
Fx	Fracture

G

GB	Gallbladder
GC	Gonococcus or gonorrhea
GCS	Glasgow Coma Scale
GI	Gastrointestinal
Gm	Gram
Gr	Grain
GSW	Gunshot wound
Gtt(s)	Drops
GU	Genitourinary
GYN	Gynecology

H

H	Hour
HA	Headache
HB	Heart block
Hct	Hematocrit
Hg	Mercury
Hgb/Hb	Hemoglobin
H&P	History and physical exam
HR	Heart rate
Ht	Height
Hx	History

I

IC	Intracardiac
ICS	Intracostal space
ICU	Intensive Care Unit
I&D	Incision and drainage
IM	Intramuscular
Inf	Inferior
IVF	Intravenous fluids
IVP	Intravenous push

J

J	Joules
JVD	Jugular-venous distention
K^+	Potassium
KO	Knocked out
KVO	Keep vein open

L

L	Liter
Lac	Laceration
Lat	Lateral
LB	Large bore
Lb	Pound
LBBB	Left bundle branch block
Lg	Large
Liq	Liquid
LLL	Left lower lobe
LMP	Last menstrual period
LLQ	Left lower quadrant
LOC	Loss of consciousness
L-spine	Lumbar spine
Lt	Left
LUL	Left Upper Lobe

M

MAE	Moves all extremities
MAST	Medical antishock trousers
mcg	Microgram
MCL	Midclavicular line
MCP	Medical Control Physician
Meds	Medications
mEq	Milliequivalent
Mg	Magnesium
Mg/mgm	Milligram
MI	Myocardial infarction
Misc.	Miscellaneous
mL	Milliliter
mm	Millimeter
MS	Multiple sclerosis
MSO_4	Morphine sulfate
MVA	Motor vehicle accident
MVC	Motor vehicle collision

N

NA	Not applicable
NaCl/NS	Normal saline
$NaHCO_3$	Sodium Bicarb
NC	Nasal cannula
Neuro	Neurology
NH	Nursing home
NKA	No known allergies
NPO	Nothing by mouth
NRBFM	Non-rebreathing face mask
NS	Normal Saline
NSR	Normal sinus rhythm
NVD	Nausea, vomiting, diarrhea

O

O_2	Oxygen
OB	Obstetrics
Occ	Occasional
OD	Overdose
Ophth	Ophthalmology
OR	Operating room
Os	Left eye
Od	Right eye
Oz	Ounce

P

PAC	Premature atrial contraction
Para	Number of pregnancies
PAT	Paroxysmal atrial tachycardia
Path	Pathology
PD	Police department
PE	Physical exam
Peds	Pediatrics
Per	By or through
PERL	Pupils equal and react to light
PERLA	Pupils equal, and react to light and accommodation
PG	Pregnant
PID	Pelvic inflammatory disease
PND	Paroxysmal nocturnal dyspnea
Po	By mouth
Pos	Positive
Post	Posterior
PSVT	Paroxysmal supraventricular tachycardia
Psych	Psychiatric
Pt	Patient
PTA	Prior to arrival
PVC	Premature ventricular contractions

R

RBBB	Right bundle branch block
RBC	Red blood cell
Resp	Respirations
RHD	Rheumatic heart disease
RLQ	Right lower quadrant
RO	Rule out
ROM	Range of motion
ROS	Review of systems
RSR	Regular sinus rhythm
RUQ	Right upper quadrant
Rx	Take, treatment

S

SL	Sublingual
SLVP	Sublingual venous plexus
SOB	Shortness of breath
Sol	Solution
Sm	Small
Stat	At once
Sub-q	Subcutaneous
Sup	Superior
Sx	Sign/symptom
SVT	Supraventricular tachycardia

T

TAB	Therapeutic abortion
TB	Tuberculosis
Tbsp	Tablespoon
Temp	Temperature
TIA	Transient ischemic attack
Tid	Three times a day
TKO	To keep open
TLC	Tender loving care
TM	Tympanic membrane
Tol	Tolerated
TRA	To run at
TRP	Temperature, pulse, respirations
Tsp	Teaspoon
Tx	Treatment

U

UA	Upon arrival, urinalysis,
Unk	Unknown
URI	Upper-respiratory infection
Uro	Urology
UTI	Urinary tract infection

V

Vag	Vaginal
VD	Venereal disease
VF	Ventricular fibrillation
Via	By way of
Vol	Volume
VS	Vital signs
VT	Ventricular tachycardia

W

WAP	Wandering atrial pacemaker
WBC	White blood cells
WNL	Within normal limits
WPW	Wolfe Parkinson White syndrome
Wt	Weight
WO	Wide open

X

X	Times

Y

YO	Year old
Yr.	Years

APPENDICES
APPROVED MEDICATION
CHAPTER 24.8.9

Issued: May 2010

Revised: Feb 12, Dec 12, Feb 14 Submitted By: EMS Branch Approved By: Medical Director

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APPROVED MEDICATION LIST

DRUG	Adult Dosage	Pediatric Dosage	Pearls
Adenosine (Adenocard) ❑ Alters the electrophysiological mechanisms responsible for the arrhythmia ❑ Route: RIVP, RIOP followed by a 10 ml NS flush	❑ 6 mg initially IVP/IO ❑ If no response in 1-2 minutes, 12 mg IVP/IO ❑	❑ 0.1 mg/Kg IVP/IO initially up to a total dose of 6 mg ❑ If no response in 1-2 minutes, 0.2 mg/Kg IVP/IO up to a total dose of 12 mg ❑ If no response in 1-2 minutes, repeat 0.2 mg/Kg IVP/IO dosage	❑ Contraindicated in patients with higher heart blocks, sick sinus syndrome, functioning artificial pacemaker, a-flutter, a-fibrillation and v-tach. ❑ Patients with asthma may be subject to experience adenosine-induced bronchoconstriction
Albuterol (Proventil, Ventolin) ❑ Beta agonist nebulized for the treatment of respiratory distress with bronchospasm ❑ Route: Nebulizer, Metered Dose Inhaler	❑ 2.5-5.0 mg as tolerated by the patient **Metered dose inhaler can be used prior to administering nebulized treatment**	❑ <2yo- 0.05-0.15mg/kg (max of 1.25mg) ❑ 2-5yo -0.1-0.15m/kg (max 2.5mg)	❑ Contraindicated in patients with severe coronary insufficiency, history of cardiac disease, or uncontrolled, severe hypertension ❑ In life threatening situations the positive effects of Albuterol outweigh the negative
Amiodarone ❑ Antidysrhythmic Blocks sodium channels, myocardial potassium channels and calcium channels; prolongs action potential and refractory period in the myocardium ❑ Route IV SLOW push or IV drip	**Cardiac Arrest** ❑ Adult: 300 mg IVP. May repeat 150 mg IVP once in 10-15 min. **Stable tachycardia**: **Adult:** 150 mg over **ten** minutes (Mix 150 mg into 50 ml bag of NS, using MACRO DRIP, run at no more than 1 drop per second)	**Pediatric cardiac arrest**: ❑ 5mg/kg IVP/IO bolus, can repeat x 2. **Pediatric:** 5mg/kg IVP/IO over 20-60 minutes, can be repeated to a maximum 15mg/kg per day	Contraindications: Known hypersensitivity. Cardiogenic shock, marked sinus Bradycardia, and second- or third-degree AV block. Lidocaine can be used as an alternative in a tachydysrhythmia, but amiodarone is preferred
Aspirin ❑ Anti-platelet medication used in cardiac chest pain ❑ Route: PO	❑ 324 mg of chewable baby Aspirin ❑ 81 mg x 4 tablets is the normal dose	❑ Not established	❑ Contraindicated in patients with insufficient renal or hepatic function, febrile pediatrics with influenza, bleeding disorders, pregnancy or asthma
Atropine Sulfate ❑ Anticholinergic drug used in bradycardia, and, cholinergic poisoning ❑ Route: IV, IO, ET	**Bradycardia** ❑ 0.5-1 mg IVP/IO q3-5 minutes up to a total of 0.04 mg/Kg **Cholinergic Poisoning** ❑ 1-2 mg IVP/IO q5 minutes, repeat until brochorrhea resolves **ET tube dosage is 2-2.5 times the IV dose.**	**Bradycardia** ❑ 0.02 mg/Kg IVP/IO q3-5 minutes up to a total of 1 mg **Cholinergic Poisoning** ❑ <2yo-0.05mg/kg IM or 0.02mg/kg IV Q5-10min prn, repeat until bronchorhea resolves **ET tube dosage is minimum of 0.1 mg/Kg**	❑ Contraindicated in narrow angled glaucoma ❑ Avoid in coronary heart disease, tachycardia, CHF, hypertension; but remember, in life threatening situations, benefit of treatment outweighs the risk ❑ **Bradycardia in children is due to hypoxia until proven otherwise**

DRUG	Adult Dosage	Pediatric Dosage	Pearls
Calcium Chloride ❑ Electrolyte used in the treatment of hyperkalemia, hypocalcemia, or calcium channel blocker toxicity by moderating nerve and muscle performance by regulating the action potential excitation threshold ❑ Route: SIVP, SIOP	**Vfib/Vtach** ❑ 1 gm IVP/IO of a 10% solution **Calcium Channel Blocker Toxicity** ❑ 500 mg IV/IO of a 10% solution ❑ Repeat dose as needed	❑ 20 mg/Kg IVP/IO	❑ Do not use in same line with sodium Bicarb. Line must be flushed with 20 ml NS if need to use same IV line. ❑ Use only in VF associated with suspected hyperkalemia, i.e. renal failure patients ❑ Do not use in patients who are also taking digoxin ❑ Avoid extravasation due to severe necrosis at the site, if this does occur make sure and make the site and report to the ED staff
Dextrose 10% ❑ Monosaccharide used to treat hypoglycemia ❑ Route: IV, IO	❑ 100ml IV x 1 ❑ May be repeated in 10 minutes if BGL remains <60mg/dl)	**Children** ❑ 5ml/kg (Dextrose 10% solution) **Neonates** ❑ (Neonates/infants-birth up to 1 year of age: 5 ml/kg of D10) with a max of 100ml per dose	❑ Contraindicated in patients with elevated blood glucose levels, suspected intraspinal or intracranial hemorrhage ❑ Avoid extravasation due to severe necrosis and sloughing at the site ❑ Can result in dilution of electrolyte concentrations and overhydration when fluid overload is present ❑ Dextrose administration may produce a vitamin B deficiency ❑ Use caution to avoid a BLG >200 in patients with suspected CVA or who are post arrest
Diltiazem (Cardizem) ❑ Calcium Channel Blocker used to treat narrow complex SVT or to control the rate in narrow complex rhythms ❑ Route: SIVP, SIOP	❑ 0.25 mg/Kg IV/IO over 2-5 minutes ❑ If no response in 15 minutes, 0.35 mg/Kg IV/IO ❑ May repeat 0.35 mg/Kg 1 time if no response in 15 minutes of second dose	❑ Not established	❑ Avoid in severe CHF, sick sinus syndrome, high degree AV block, hypotension
Diphenhydramine (Benedryl) ❑ Antihistamine used to inhibit the advancement of allergic reactions ❑ Route: IV, IO, IM	**Allergic Reaction** ❑ 25-50 mg IVP/IO/IM **Dystonic Reaction** ❑ 50 mg IVP/IO/IM	❑ 1-2 mg/Kg IVP/IO/IM to a maximum dose of 50 mg ❑ Not for infants <3 months old	❑ Increases the effects of CNS depressants

DRUG	Adult Dosage	Pediatric Dosage	Pearls
Dopamine (Intropin) ❑ Inotropic agent used to stimulate both adrenergic and dopaminergic receptors ❑ Route: Regulated IV Infusion	❑ 400 mg in 250ml NS to run at 10-20 mcg/Kg/min, titrate to systolic BP of 90-100 mm/Hg	❑ 400 mg in 250ml NS to run at 10-20 mcg/Kg/min, titrate to age appropriate BP	❑ Can increase afterload due to its vasoconstrictive effects ❑ Contraindicated in patients with V-fibrillation ❑ Monitor BP and ECG closely, can cause heart irritability causing dysrhythmias and PVCs
Epinephrine 1:10,000 (Adrenalin) ❑ Sympathomimetic vasopressor used in the treatment of cardiac arrest and anaphylaxis induced hypotension ❑ Route: IV, IO, ET	**Anaphylaxis induced hypotension** ❑ **inject 1ml of epi 1:10,000 into 9ml of normal saline, then you can administer 1-2ml of this solution (1:100,000) Q 5min prn hypotension,** then 1-4 mcg/min IV as needed **Cardiac Arrest** ❑ 1 mg IVP/IO q3-5 minutes **ET tube dose is 2-2.5 times the IV dose**	**Anaphylaxis induced hypotension** ❑ Call medical control **Cardiac Arrest** ❑ 0.01 mg/Kg IVP/IO q3-5 minutes **ET tube dose is 10 times the IV dose**	❑ Use with caution in patients with coronary artery disease, uncontrolled hypertension, serious ventricular arrhythmias, during the second stage of labor and the elderly with diabetes mellitus, hypertension, cardiovascular disease or cerebrovascular insufficiency ❑ In Life threatening conditions, benefit of treatment outweighs risk
Epihephrine 1:1,000 ❑ Sympathomimetic vasopressor used in the treatment of anaphylaxis ❑ Route: IM	**Anaphylaxix** ❑ 0.3 mg IM 5-15 min. as needed for hypotension and SOB (1 mg max dose) ❑ **Alternative**, see Epinephrine 1:10,000	**Anaphylaxis** ❑ 0.01 mg/kg (1:1,000) IM Q5-20 min x 3 doses (0.5 mg max dose) ❑ **Alternative**, see Epinephrine 1:10,000	❑ Use with caution in patients with coronary artery disease, uncontrolled hypertension, serious ventricular arrhythmias, during the second stage of labor and the elderly with diabetes mellitus, hypertension, cardiovascular disease or cerebrovascular insufficiency ❑ **inject 1ml of epi 1:10,000 into 9ml of normal saline, then you can administer 1-2ml of this solution (1:100,000) Q 5min prn hypotension** ❑
Fentanyl (Sublimaze) ❑ For relief of moderate to severe pain. ❑ Route: IV, IO, IN	❑ 25 mcg to 50 mcg slow IVP/IO/IN q 5 min to a max dose of 150 mcg. ❑ Medical Control must be contacted for additional doses above 150 mcg. ❑ Maintain systolic BP >90	❑ 2mcg/kg IVP/IO/IN Q 5min to a max of 150mcg. ❑ Medical control must be contacted for additional doses above 150mcg	❑ Caution in Patients with hypersensitivity to Hydromorphone, intracranial lesions associated with increased ICP, depressed ventilator function (COPD, cor pulmonale, emphysema, kyphoscoliosis and status asthmaticus.

DRUG	Adult Dosage	Pediatric Dosage	Pearls
Glucagon ❑ Hyperglycemic agent, Pancreatic Hormone ❑ Route: IM/IN (preferably in anterio lateral thigh)	❑ 1 mg IM/IN ❑ May repeat in 7-10 min. 1 mg IM ❑ If no change in BGL after two doses, Dextrose must be given.	❑ <20kg- 0.5mg IM/IN, max dose 1mg ❑ >20kg – 1mg IM/IN, max dose 1mg ❑ If no changes, must give Dextrose or contact MCP	❑ May cause nausea, vomiting, tachycardia, and hypertension ❑ Contraindicated in hyperglycemic patient ❑ May not increase glucose in neonates and patients with liver failure
Haloperidol (Haldol) ❑ Antipsychotic used as chemical restraint for psychotic patients ❑ Route: SIVP, SIOP, IM	❑ 2.5-5 mg IVP/IO ❑ 5-10 mg IM	❑ Ages 3-12yo-0.05-0.15 mg/kg IM up to a maximum dose of 5 mg (IM only) **Pediatric administration should be IM only**	❑ Contraindicated in patients with CNS depression, pregnant, severe liver or cardiac disease, QT prolongation on EKG or head injury ❑ May increase tricyclic antidepressant levels and hypotensive actions of antihypertensive agents
Ipratropium (Atrovent) ❑ Anticholinergic used to inhibit secretions from the serous and seromucous glands ❑ Route: Nebulizer	❑ 2.5ml = 0.5mg ipratropium ❑ 0.5 mg mixed with 2.5 mg of Albuterol One dose only	❑ Ages 5-12yo-0.125-0.25mg nebulizer x 1 ❑ >12yo 0.25mg-0.5mg nebulizer x 1	❑ Albuterol increases the effects of ipratropium ❑ Contraindicated for use in patients with peanut allergies ❑ Use with caution in pregnancy ❑ Not indicated for acute onset of bronchospasm
Ketorolac (Toradol) ❑ A non-steroidal anti-inflammatory used to relieve pain and to reduce swelling	❑ Single dose 30 mg IVP/ IM	❑ 0.5 mg/kg ❑ Not to be used in children less than 6years of age	❑ Use caution in patients with active bleeding ❑ Use caution in patients having headaches ❑ Use caution if suspected bleeding (trauma) ❑ Do not use if aspirin allergy along with NSAID allergy ❑ Use caution in patients with Hypertension/Asthma/COPD

Labetalol (Trandate) ❑ An alpha and beta adrenergic blocker used to decrease blood pressure ❑ Place the patient in the supine position to administer if tolerated ❑ Route: SIVP, SIOP	❑ 0.2 mg/Kg IVP/IO ❑ If goal not reached after 5 minutes, 0.4 mg/Kg IVP/IO ❑ If goal not reached after 5 minutes, 0.8 mg/Kg IVP/IO ❑ If goal not reached after 5 minutes, may repeat 0.8 mg/Kg IVP/IO x 2	❑ Not established	❑ Contraindicated in patients with cardiogenic shock, pulmonary edema, bradycardia, AV block, uncompensated CHF, reactive airway disease, or higher heart blocks ❑ Use caution in patients with impaired hepatic function ❑ Bronchodilator effects may be blunted ❑ Nitroglycerin may augment hypotensive effects ❑ Patient should be continuously monitored for hypotension, bradycardia, ECG changes, CHF, or bronchospasm
Levophed (norepinephrine bitartrate) ❑ For blood pressure control in certain acute hypotensive states such as cardiogenic shock or septicemia.	❑ **INFUSION ONLY** ❑ 4mg in 250ml NS (16mcg/ml) ❑ 0.1-0.5 mcg/kg/min IV/IO and titrate to effective blood pressure	❑ **INFUSION ONLY** ❑ 4mg in 250ML NS (16mcg/ml) ❑ 0.1-0.5mcg/kg/min IV/IO and titrate to effective blood pressure	❑ Levophed can cause peripheral vasoconstriction and hypertension, this drug should be used with caution ❑ Infiltration of this drug leads to necrosis, therefore site should be marked and ED staff alerted

DRUG	Adult Dosage	Pediatric Dosage	Pearls
Lidocaine (Xylocaine) ❑ Antidysrhythmic used in the treatment of v-tach, v-fibrillation, wide complex tachycardia of unknown origin ❑ Anesthetic used to facilitate the placement of a nasal tracheal tube. ❑ Route: IV, IO, ET, Nebulizer, IV infusion	**Cardiac Arrest** ❑ 1-1.5 mg/Kg IVP/IO initially ❑ 0.5-0.75 mg/Kg IVP/IO for each subsequent dose to a total dose of 3 mg/Kg **Tachycardia** ❑ 1-1.5 mg/Kg IVP/IO initially ❑ 0.5-0.75 mg/Kg IVP/IO q10 minutes up to a total dose of 3 mg/Kg ❑ With conversion of rhythm initiate infusion, 1 gm in 250ml NS, start with 2 mg/min, titrate for further ectopy up to 4 mg/min **Nasal Tracheal Intubation** ❑ 4 ml of 2% Lidocaine nebulized	**Cardiac Arrest** ❑ 1 mg/Kg IVP/IO bolus ❑ Maximum dose of 50 mg IVP/IO **Tachycardia** ❑ 1 mg/Kg IVP/IO initially ❑ 0.5 mg/Kg IVP/IO for each subsequent dose up to a total dose of 3 mg/Kg ❑ With conversion of the rhythm initiate infusion, 200 mg in 250ml NS, start with 20 mcg/Kg/min and titrate for further ectopy up to 50 mcg/Kg/min **Nasal Tracheal Intubation** ❑ 4 ml of 2% Lidocaine nebulized **ET tube dose is 2-2.5 times the IV dose.**	❑ Contraindicated in patients with Wolff-Parkinson- White syndrome, severe SA, AV or intraventricular block if an artificial pacemaker is not in place ❑ Contraindicated in use with Amiodorone ❑ Lidocaine plasma concentrations can reach toxic levels when taken with beta-blockers. ❑ May increase the effects of succinylcholine ❑ High plasma concentrations can cause seizures, heart block and AV abnormalities ❑ Use caution in patients with hepatic disease, hypovolemia or shock, respiratory depression, incomplete heart blocks or bradycardia, or atrial fibrillation ❑ Decreased dose in the elderly due to increased risk for CNS and cardiac side effects

DRUG	Adult Dosage	Pediatric Dosage	Pearls
Magnesium Sulfate ❑ Electrolyte used to reduce muscle contractions and block peripheral neuromuscular transmission ❑ Route: SIVP, IV Infusion, SIOP	**Cardiac Arrest** **Vfib/Vtach, Torsades** ❑ 2 gm IVP/IO bolus **Torsades de Pointes With a Pulse** ❑ 1-2 gm in 100 ml of NS to run over 5-60 minutes ❑ 0.5-1 gm/hr, titrate to control of rhythm **Digoxin Toxicity** ❑ 2 gm **Pre-Eclampsia** ❑ 2-4 gm IV/IO bolus over 10-15 minutes **Eclampsia** ❑ 2 gm IV/IO bolus over 4 minutes ❑ 10 gm in 250ml of NS to run at 50 ml/hr ❑ If patient starts seizing during the infusion administer another 2 gm IV/IO bolus over 4 minutes	**Torsades de Pointes With a Pulse** ❑ 2 gm in 250ml NS to run at 25-50 mg/Kg over 10-20 minutes up to 2 gm **Pre-Eclampsia** ❑ 2-4 gm IV/IO bolus over 10-15 minutes **Eclampsia** ❑ 2 gm IV/IO bolus over 4 minutes ❑ 10 gm in 250ml of NS to run at 50 ml/hr **If patient starts seizing during the infusion administer another 2 gm IV/IO bolus over 4 minutes**	❑ Contraindicated in patients with myocardial damage, hepatitis, Addison disease, heart blocks, or significant renal impairment ❑ Use with caution in patients on digitalis, may cause heart blocks and renal impairment may lead to toxicity ❑ IV calcium chloride may be given to antagonize the effects of magnesium sulfate
Methyl-prednisolone (Solu-Medrol) ❑ A glucocorticoid that suppresses inflammation potentiates vascular smooth muscle relaxation and may alter airway hyperactivity. It is also known to reduce post-traumatic spinal cord edema. ❑ Route: IV, IO, IV infusion	**Anaphylaxis** ❑ 125 mg SIVP/IO over 2 minutes **Respiratory Distress** ❑ 125 mg IV/IO	❑ 1-2 mg/Kg/dose IV/IO	❑ Drug interactions include NSAIDs and live virus vaccines ❑ Hypoglycemic responses to insulin and oral hypoglycemic agents may be decreased ❑ Use caution in patients with GI bleeding, diabetes mellitus or severe infection
Midazolam (Versed) ❑ Benzodiazepine sedative hypnotic used for the control of seizures and/or induction agent to assist in endotracheal intubation ❑ Route: Slow IV, Slow IO, Slow IM, or intra nasally (atomized)	❑ 1-2 mg over 2 minutes. If desired effect not achieved after 2 minutes may repeat to a total dose of 10 mg ❑ 1-2 mg for sedation pre-cardioversion	❑ 0.05-0.1 mg/kg over 2 minutes. If desired effect not achieved after 2 minutes may repeat to a total dose of 5 mg ❑ ****CAUTION**** Broselow tape does not reflect accurate dosage for seizure patients. Dose shown is for Rapid sequence intubation.	❑ Monitor vital signs following administration. ❑ Be prepared for hemodynamic effects in hypovolemia patient. Treat as needed with volume replacement and trendelenberg. May require vasopressor to correct. ❑ Be prepared to assist ventilations and control airway with BVM and/or endotracheal intubation. ❑ Rapid administration may exacerbate side effects

DRUG	Adult Dosage	Pediatric Dosage	Pearls
Morphine Sulfate ❑ Opioid Analgesic used for controlling pain and anxiety ❑ Can also be used in the treatment of pulmonary edema due to its peripheral vasodilatation effects ❑ Route: SIVP, SIOP	❑ 1 - 5 mg IVP/IO initially ❑ May be repeated q5 minutes as needed to control pain or anxiety	❑ 0.1 mg/Kg IVP/IO initially ❑ May be repeated q5 minutes as needed to control pain or anxiety up to a maximum dose of 15 mg	❑ Contraindicated in patients with hypovolemia or shock, head injuries, increased ICP, nausea/vomiting or respiratory depression ❑ MAO inhibitors may potentiate adverse effects ❑ Use caution in patients with atrial flutter or other supraventricular tachycardias ❑ Use caution, may increase ventricular response
Naloxone (Narcan) ❑ Narcotic Antagonist used in the treatment of opiate overdoses ❑ Route: SIVP, SIOP, IM, ET, IN	❑ 0.4-2 mg IVP/IO/IM/IN q2 minutes, titrate to respiratory increase **ET tube dose is 2-2.5 times the IV dose**	❑ 0.1 mg/Kg IVP/IO/IM/IN q2 minutes, titrate to respiratory increase or to a maximum dose of 2 mg	❑ Use with caution in patients with cardiac disease due to the possibility of flash pulmonary edema ❑ Use with caution in patients with possible narcotic addiction due to the possibility of withdrawal ❑ Administration of naloxone may not reverse hypotension
Nasal Spray ❑ Vasoconstrictor to facilitate nasal intubation ❑ Route: Metered Dose Inhaler	❑ 2 sprays in the appropriate nare	❑ 1-2 sprays in the appropriate nare	
Nitro Paste (Nitro-Bid Paste) ❑ Vasodilator used for continued treatment for angina, CHF and hypertension ❑ Route: TD	❑ ½"-2", applied to the anterior chest wall	❑ Not Established	❑ Same as Nitroglycerin ❑ Monitor patients closely for hypotension
Nitroglycerin (Nitrostat) ❑ Vasodilator used in the treatment of angina, CHF, and hypertension ❑ Route: SL	❑ 0.4 mg SL q5, as long as systolic BP is >100 mm Hg, until desired effects	❑ Not Established	❑ Contraindicated in shock, severe bradycardia, severe tachycardia, Sexual Performance Drugs taken within 36 hours, head trauma and cerebral hemorrhage ❑ **DO NOT USE** in patients presenting with Inferior MI (Leads II, III, avF) ❑ Marked symptomatic orthostatic hypotension may occur when given with calcium channel blockers
Phenergan (Promethazine) ❑ Nausea, Vomiting ❑ IV, IM	❑ 12.5-25 mg SIVP, IM	❑ ❑ Not Established	❑ Use caution with patients who have glaucoma, liver impairment, seizure disorders and elderly patients ❑ Must dilute in at least 10 ml NS before administration ❑ May lead to alteration in mental status

Drug	Adult Dosage	Pediatric Dosage	Pearls
Sodium Bicarbonate ❑ Alkalinizing agent used in the treatment of tricyclic overdoses and stabilize cardiac membranes in a hyperkalemic state ❑ Route: SIVP, SIOP, IV Infusion	**Cardiac Arrest** ❑ 1 mEq/Kg IVP/IO initially ❑ 0.5 mEq/Kg IVP/IO q10 minutes **Tricyclic Overdose** ❑ 50-100 mEq IVP/IO initially ❑ Infusion of 100 mEq in 1000 ml of NS to run at 150 ml/hr	**Cardiac Arrest** ❑ 1 mEq/Kg IVP/IO of 4.2%, initially ❑ 0.5 mEq/Kg IVP/IO of 4.2% q10 minutes **Tricyclic Overdose** ❑ Contact MCP	❑ The use of Sodium Bicarbonate in Cardiac arrest is only indicated in patients with concerns of hyperkalemia or tricyclic overdose ❑ Contraindicated in patients with unknown abdominal pain or severe pulmonary edema ❑ Use caution in patients with CHF, edema, cirrhosis, corticosteriod use or renal failure due to possibility of electrolyte imbalances ❑ Extravasation during administration can cause tissue necrosis
Vasopressin (Pitressin) ❑ Vasopressor used in the treatment of hypotension in various situations. ❑ Route: IV, IO, ET	❑ 40 U IVP/IO single dose administration ❑ May repeat 40 U IVP/IO 1x after 15 minutes in cardiac arrest	❑ Not established	❑ May be useful in the treatment of vasodilatory shock ❑ May provoke cardiac ischemia and angina due to increased peripheral vascular resistance ❑ Helpful in patients with gastrointestinal bleed associated with varices
Zofran (Ondansetron hydrochloride) ❑ Prevention of nausea and vomiting	❑ 4mg IV/PO Q 10min PRN nausea, may repeat x 1	❑ >6mos-0.1mg/kg Q10min PRN nausea, may repeat x1 (max 4mg)	❑ Do not give to patients who have a known hypersensitivity to the drug. ❑ Contraindicated in patients with prolonged QT on ekg and liver disease

TECHNICAL RESCUE GUIDELINES

CHAPTER 25.1

Issued: 04/08 Revised: 09/09, January 2010

Submitted By: Ed Kennedy, District Chief Approved By: Ed Bailey, Chief

Purpose

The purpose of this program is to provide dedicated teams of individuals capable of performing rescue operations requiring specialized equipment and techniques. The areas of specialization include, but are not limited to, high angle rope rescue, confined space, trench rescue, building collapse, vehicle and machinery extrication.

Responsibility and Authority

Alachua County Department of Public Safety maintains a State of Florida recognized Type II Light Technical Rescue Team (LTRT). This team is considered a state wide resource and is deployable as a single unit or in conjunction with Florida Task Force 8 for urban search and rescue (USAR). As a Type II Light Technical Rescue Team the unit is capable of immediate response if needed and can, be deployed as part of a force USAR response within 3 hours.

Organization

The Team Manager is responsible for administration of the Type II Light Technical Rescue Team.

The LTRT vehicles and equipment will be located at Station 16. Every effort will be made to ensure that at least 6 members of the Team are on duty at all times. Requests for the LTRT) to respond to an incident may be made through the State of Florida or through Mutual Aide.

Member Qualifications

All members of the Type ll LTRT will be certified to the Operations Level in the five (5) disciplines as outlined by the State of Florida.

Team members who meet the Technician Level are encouraged to get additional training to the Specialist Level.

The Technical Branch of Alachua County Department of Public Safety will oversee all training and shall keep a separate training folder for each individual in the program.

All members of the LTRT are required to demonstrate proficiency appropriate of technical skills on a yearly basis as mandated by the State of Florida. The Technical Services Branch of ACDPS will assist the Team Manager to accomplish this objective.

Response

Response for a Catastrophic Event with no warning

The Team Manager will be notified of any event that requires a response within 3 hours. Once notified, the Manager will contact the on duty District Chiefs to assist in contacting individuals who are available for response. The response teams will be designated Red, White and Blue and will consist of 6 personnel. In the event that a team member cannot be deployed he/she is responsible for ensuring that an alternate has been selected. The name of the alternate shall be given to the team manager prior to any deployment actions.

The Team Manager will contact the Section Chief of Fire Rescue or designee to secure all necessary pre deployment information including but not limited to: Tasking number from State, names and contact information for deployed members.

The Team Manager will ensure that contact is made with the assigned Task Force leader and that an appropriate assembly place for the team is established.

Currently for a deployment north of Gainesville the Task Force assembly point is Station 16; for a deployment south of Gainesville the assembly point is Marion County Station 20.

The Task Force Manager or designee will ensure that the ACDPS component is self sufficient for at least 5 days. Supplies should include water, MRE's, cots and ATV's.

During deployment the Team Manager will, when possible, contact the Section Chief of Fire Rescue or designee to provide updates and expected demobilization dates. The Team Manager will have in their possession a Departmental issued phone.

Upon returning from deployment, the Team Manager or designee shall submit within a reasonable period of time the following: payroll records, injury reports if necessary and an after action report documenting all activities of the team during deployment. Team personnell will be paid in accordance with adopted deployment policies and procedures.

Response for an Anticipated Event

Incidents such as hurricanes, political gatherings and sporting events are usually anticipated and require a less urgent response of USAR personnel.

If possible the Team Manager will brief crews prior to the event providing information about the teams anticipated activities. Personnel on call for the event will be updated on the status of the pending event.

Necessary supplies (food, water, ATV's, transportation) will be inventoried and moved to Station 16.

Upon returning from deployment, the Team Manager or designee will complete all required paperwork as outlined previously.

Immediate Response

When notified of an event requiring the immediate response of the Type II Light Technical Rescue Team. The on duty District Chief shall contact the Team Manager and relay the need for urgent action. If possible the Team Manager will accompany the team to the incident. It will be the responsibility of the on duty District Chief to obtain all information prior to the deployment of the team. This information will include a task number, location of the event, type of event and anticipated length of deployment.

A response of the LTRT requires six (6) Operations Level trained personnel. In the event that ACDPS cannot immediately accommodate this provision, the on duty District Chief will contact the Gainesville Fire Rescue Department (District One) and request assistance. The decision to respond shall be based on the ability to provide the necessary personnel and equipment.

Apparatus utilized to transport the response team may include Squad 16, Quint 16, Rescue 16 and a Command vehicle. On extended operations the District Chief in charge of scheduling will immediately to backfill those personnel and apparatus committed as LTRT.

In the event that a complete response cannot be generated the requesting agency shall be informed of ACDPS's resources. It is possible that ACDPS's personnel might still respond if requested.

Equipment Inventory

An inventory of the LTRT equipment cache will be maintained by personnel assigned to Station 16 “B” shift. The operational status and location of this equipment will be determined monthly, commencing on the first “B” shift of each month. All deficiencies will be reported to the Team Manager.

See appendix for equipment inventory.

Training

All personnel assigned to the LTRT (all personnel certified to Operations Level) will be evaluated annually to ensure that skills are current. The document to be utilized for this review (Operations level only) will be the State “Member Readiness Evaluation“. The Training Officer assigned with the duties will ensure that all members meet or exceed all applicable skills as listed on the form.

At least two hours of technical rescue training will be conducted each week. A Company Officer or designee will supervise and document each session adhering to departmental guidelines. The Team Manager will review the Technical Rescue training documents monthly and report these activities to the Technical Services Branch by the 15th of each month.

Additional training activities may be initiated by the Team Manager.

Appendix 1

Training Calendar for Technical Rescue Team

January Collapse February Vehicle/Machinery Extrication March Confined Space April Trench May Ropes June Deployment readiness July USNG August Equipment Skills September Assigned by Company Officer October Field Operation Guide (FOG) November Assigned by Company Officer December Review and make up sessions if applicable

Appendix 2

Equipment Inventory

8-10 Lb Sledge Hammer 2 3-4 Lb. Sledge Hammer 2 Cold Chisel (1’’X 7 ? ”) 2 Pinch Point Pry Bar (60”) 4 Claw Wrecking Bar (3’) 2 Hacksaw (heavy duty Stanley) 2 Carbide Hacksaw Blade pkg. 3 Crosscut Hacksaw (26”) 2 Bolt Cutter (30”) HK Porter 1 Scoop Shovel “D” Handle 1 Axe (Flat Head) Nupla 1 Axe (Pick Head) Nupia 1 Shovel, Long Handle SQ. Pt. 1 Shovel, Long Handle Rd. Pt. 1 Chain set 1 ea 1’’.w/grab hook on each end Omaha Sling 1 1 ea. ? 5’ w/grab hook & slip hook 1 1 ea. ?10’ w/grab hook & slip hook 1 Come Along (3 ton)Little 404 wna 1 Air Bag Set 1 Tape Measure (25’) Stanley 33-600 2 Framing Hammer (24oz) Estwing 2 Tri or Speed Square Johnson RAS 1 2 Carpenter belts 2 Generator (5kw) Honda 1 Floodlight (500wt) Pro Series 6 Extension Cords (50’) 6 Wye Electrical adapter 1 5 ft X 1 in. Tubular Web Blue 6 12 ft X 1 in. Tubular Web Yellow 6 15 ft X 1 in. Tubular Web Orange 6 20 ft. X 1 in. Tubular web Red 6 CMC Rescue Pick-off Strap 1 CMC ProTech Fire-Rescue Harness L/XL 2 150 ft X ½ in CMC Rescue Lifeline Orange 1 150 ft X ½ in CMC Rescue Lifeline Red 1 6 ft X 8mm Prusik cord Teal 6 Ultra-Pro Edge protector 2 CMC Large Steel Carabiner, Gold 12 CMC Large Steel Carabiner,Gold (stretcher) 4 CMC Rescue ProSeries Single Pulley 3 CMC Rescue Aluminum 8 w/ears,black 2 CMC Rescue #2 Rope Bag, Orange 1 CMC Rescue #2 Rope bag, Red 1 CMC Proseries Rescue Harness 1 Traverse titan Rescue Stretcher (tapered) 1 Four Gas meter IST AIM 600 1 Electrical Detection Device 1 Lock Out/ Tag Out Kit 2 Chain Saw Stihl 1 Saw Circular 10 ¼ w/blades 1 Sawsall, Milwaukee 1 Technical Search Device, Snake Eye 1 Sawsall, Dewalt 1 Gibbs Ascenders 2 Ladder Rack 1 Carabiners, Red 2 Etrier 1 Load Release 2 Generator, Honda 1 Welding Kit 1 Replacement Parts for Generator/Welder 1

Appendix 3

Directive on the Usage of Alachua County Department of Public Safety's All Terrain Vehicles (ATV)

1. ATV's are to be utilized by members of either the USAR Team or Light Technical Rescue Team.

2. Currently the ATV's are stationed at Station 16. Maintenance and operational issues will be assigned to "C" Shift. All repairs will be conducted by Alachua County Fleet Management.

3. In the event of a deployment, the ACDPS Team Leader will secure all transportation requirements for the ATV's.

4. The following Safety requirements shall be followed at all times:

a) Helmets will be worn whenever the vehicle is moving.

b) Eye Protection to be worn at all times.

c) Long pants and boots are required whenever operating an ATV. During deployments a long sleeve shirt/jacket will be worn.

d) Ride within your abilities.

e) One rider per machine.

f) Check weather forecast, if lightening is present seek a safe shelter.

g) Obey all traffic and information signs.

h) If operating in nighttime conditions, a flashlight must be carried in case of an emergency.

i) During emergency operations, a two way radio must be carried by the operator.