Polk County Fire Rescue

Clinical Care Guideline

January 2015

Version A

Definitions/Acronyms

PEARLS	**Physical Evidence And Reasoned Logic (Scientific method)**
AICD	**Automated Internal Cardiac Defibrilator**
IRF	**Initial Receiveing Facility**
CSC	**Comprehensive Stroke Center**
PSC	**Primary Stroke Center**
LMP	**Last Menstrual Period**
BSI	**Body substance Isolation**
LBT	**Length Based Tape**

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SECTION ONE

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Introduction

I. AUTHORIZATION

A. The CLINICAL CARE GUIDELINES were developed and circulated under authorization of the below signed Medical Director for Polk County in accordance with Florida Statute 401 and Florida Administrative Code (FAC) 64J-1.

B. The information contained within this document is intended to provide and ensure uniform treatment for all patients who receive pre-hospital care by approved Polk County agencies. These GUIDELINES apply exclusively to the present and future ALS and BLS agencies responding to the activation of the 911 systems within Polk County who are working under the Medical Director. While attempts have been made to cover all patients who access our system, the Medical Director realizes that unforeseen scenarios or situations may arise. It is suggested that for those instances, medical personnel will follow the INITIAL MEDICAL CARE PROTOCOL (or other appropriate PROTOCOLS), exercise their own judgment, and contact Medical Control online should any questions or problems arise. Our goal is to provide care when appropriate, relieve pain and suffering and do no harm. The patient's best interest should be the final determinant for all decisions.

C. The CLINICAL CARE GUIDELINES contains the following sections:

1. ADMINISTRATIVE POLICIES
2. PROTOCOLS
3. FORMULARY
4. PROCEDURE GUIDELINES
5. APPENDICES
6. SPECIAL OPERATIONS TEAM PROTOCOLS

D. Changes in these GUIDELINES can only be made and promulgated by the Medical Director for Polk County. Any use or duplication of this document requires the written consent of the administration of Polk County Fire Rescue.

E. The following agencies have agreed to abide by the contents of these CLINICAL CARE GUIDELINES:

Auburndale Fire Department	Bartow Fire Department	Davenport Fire Department
Dundee Fire Department	Fort Meade Fire Department	Frostproof Fire Department
Haines City Fire Department	Lake Alfred Fire Department	Lake Wales Fire Department
Lakeland Fire Department	Winter Haven Fire Department	

F. Approved By:

Pushpal R. Banerjee, D.O.
Medical Director

Polk County Fire Rescue
Administrative Policies
Introduction

II. PURPOSE AND RATIONALE

A. The PCFR CLINICAL CARE GUIDELINES document is written as treatment parameters for the management of patient care. The Paramedic and EMT are given the authority through these GUIDELINES to function under the license and approval of the Medical Director. The intention of these GUIDELINES is to facilitate the rapid dispersal of adequate and acceptable measures aimed at stabilizing the afflicted and ensuring safe and comfortable delivery to an appropriate receiving facility.

B. These GUIDELINES shall not circumvent the need to establish radio contact with Medical Control but will provide a means to initiate care in a timely manner. They are to be used only when the Paramedic or EMT is on duty and is acting as a duly authorized representative of their particular agency under the direction of the Medical Director of Polk County.

C. Modification

1. Modification of these GUIDELINES may be required and such modifications will be dictated by patient assessment to customize the most appropriate treatment for each individual patient. These modifications will be done in conjunction with Medical Control. Personnel are encouraged to make early and frequent contact with Medical Control whenever a doubt exists as to the proper management of any individual patient.

2. Medical Control is defined as:

   a. PCFR Medical Director, Associates and OMD Medical Control Officer(s)

   b. Receiving facility physician where the patient will ultimately be transported.

III. TREATMENT ALGORITHMS

A. These GUIDELINES are designed to rely heavily on the training and good judgment of the individuals using them. APPENDICES are provided for reference and are considered a part of the PCFR CLINICAL CARE GUIDELINES**.** Several PROTOCOLS are divided between the care and treatment of the stable patient versus the unstable patient. Most of which revolve around the treatment of tachyarrhythmias and bradyarrhythmias. As a matter of definition, the **UNSTABLE** patient is one who presents with any of the following:

1. SIGNIFICANT DISCOMFORT OF SUSPECTED CARDIAC ORIGIN
2. SEVERE DYSPNEA
3. ACUTE ALTERED MENTAL STATUS
4. HYPOTENSION WITH SIGNS OF DECREASED TISSUE PERFUSION

Polk County Fire Rescue
Administrative Policies
General Measures

The following GENERAL MEASURES shall be applied to help promote speed and efficiency when rendering emergency medical care to the sick and injured. These measures provide general parameters for pre-hospital emergency care delivery in Polk County.

I. Life Safety: The overall safety of personnel is paramount to quality patient care.

A. Vehicle Operation Safety: All crews are expected to use knowledge, foresight, and judgment at all times while operating an emergency vehicle. This is vital to response, care, and delivery of the patient to an appropriate facility. Patients should be prioritized in such a manner as to send the most appropriate resource(s) in the most appropriate manner whether emergency or non-emergency based upon initial dispatch information.

B. Scene Safety: Each scene should be properly evaluated for hazardous materials, fire, violent patients, etc. The scene should be secured by appropriate agencies, if necessary, prior to arrival and before patient contact.

C. Body Substance Isolation (BSI): Proper Personal Protective Equipment MUST be utilized according to Exposure Control Plan Policies.

D. Medical Equipment: Only medical equipment / supplies approved by the Medical Director will be utilized for patient care. New equipment / supplies may be field tested (with specific parameters), but only after evaluation and approval by the Medical Director.

II. Incident Management

A. Resources: Assess the need for additional support and request appropriate resources as necessary. Additional resources should be requested to the scene as early as possible and response mode prioritized by the on scene incident commander.

B. Mass Casualty: The goal is to rapidly identify patient's injuries and sort them according to their severity and need for treatment. Refer to TRIAGE SYSTEM ADMINISTRATIVE POLICY for specific details.

Mutual Aid from Out of County Agencies: All requests for mutual aid transport must be approved by the PCFR Administrative Staff.

C. Incident Command: A dynamic organizational structure that expands and contracts as need to manage an event. Every effort will be utilized to follow the incident command structure.

D. Mutual Aid: In cases of out of county, mutual aid response, Polk County personnel are directed to utilize the PCFR CLINICAL CARE GUIDELINES for all facets of pre-hospital medical care.

III. Patient Care

A. Informed consent: Always attempt to obtain informed consent prior to treatment. Respect the patient's right to privacy and dignity. Courtesy, concern, and common sense will ensure the patient receives the best possible care.

B. Rapid initial assessment: A Paramedic should generally be able to decide within 3 minutes after patient contact if Advanced Life Support (ALS) will be needed and should be instituted simultaneously with the initial assessment.

1. Rapid stabilization should, in most cases, be done on scene (where the patient is encountered) prior to movement from the scene to the unit.

2. A comprehensive exam is appropriate after the patient has been stabilized.

C. Assessment and care: Generally, the assessment and initial therapy (including IV insertion[s]) should be completed within the first 15 minutes after patient contact. Except for extensive extrication, or other significantly atypical situations, the patient should be enroute to a receiving facility within this time frame. Additional treatment if indicated should be continued during transport.

D. Care level: The Paramedic is ultimately responsible for all patient care and will perform an assessment on all patients to determine their level of care.

1. Advanced Life Support (ALS): The Paramedic is required to attend all patients deemed ALS in the patient compartment during transport. As a general rule, an ALS patient is defined as one who portrays signs / symptoms that fit into 1 or more of the chief complaints as outlined in the PROTOCOL. Patients who have an intravenous line are NOT considered BLS patients, regardless of complaint, and must be tended to by a Paramedic.
2. Basic Life Support (BLS): The Paramedic may designate an EMT to attend BLS patients, but still remains ultimately responsible for patient care. The EMT must document on the run report that the Paramedic, stating name and credentials, initially assessed the BLS patient. An EMT may tend to patients with: a non-prehospital Heparin-lock or saline-lock (e. g. BLS transfer) provided the patient's chief complaint or diagnosis is not ALS in nature. Other examples include isolated upper extremity injury/ closed fracture, c-spine precaution/chronic back pain from traumatic injury/general ground level fall, generalized fever after R/O of possible Sepsis, etc. **Common sense plays a large role in these situations.**
3. Refusal of Transport: All patients who receive treatment are to be transported by appropriate means to an appropriate receiving facility for further evaluation. If the patient refuses transport, refer to the REFUSAL OF TREATMENT / TRANSPORT ADMINISTRATIVE POLICY.
4. Personnel with Paramedic priveledges: As noted in the ALS Intern Program, **IF** an intern successfully completes all phases of the program and there are no Paramedic positions available the Intern will continue to have full Paramedic privileges. **IF** an intern successfully completes all phases and elects not to take a Paramedic position then the Intern will have Paramedic privileges except the administration of narcotic substances or attending ALS patients during transport to the hospital for a period of no more than one year.

E. Medication dosing for Medicals: All medication dosages listed are for adults, unless otherwise specified.

1. Adult: An adult patient is one who is 8 years of age or older.
2. Pediatric: A pediatric patient is under 8 years of age and 80 lbs. or less according to Length-Based Tape.
3. Infant: An infant patient is from birth to 1 year of age.

F. Trauma: For traumatic situations, ages are defined by the State of Florida Trauma Transport criteria:

1. Adult: An adult patient is one who is 16 years of age or older.
2. Pediatric: A pediatric patient is one with the anatomical characteristics of a person fifteen (15) years or younger.

IV. Medical Control

A. Definition: An on-line emergency room physician who is willing to accept responsibility for the actions of EMS/Rescue personnel or the Medical Director and or his associates.

B. Contact: If needed to deviate from or modify the PCFR CLINICAL CARE GUIDELINES, the following will be utilized to receive orders:

1. PCFR Medical Director, Associates and OMD Medical Control Officer(s)

-OR-

2. Receiving facility physician where the patient will ultimately be transported.

C. PCFR MEDICAL DIRECTOR ORDERS: If the PCFR Medical Director has given an order, the Paramedic does not have to receive a signature for the EPCR. The Paramedic will make a notation in the report stating that orders were received and verified with the PCFR Medical Director.

D. Disclaimer: The above contact information is intended to be utilized to receive further information or orders from a physician. If a physician has been contacted and orders given contrary to the request, it is not prudent to contact another physician to attempt to countermand the previous orders.

E. Documentation: Provide contact name, time, orders requested, and orders received on the patient care report (PCR). Also document if unable to contact a particular resource, as justification for contacting the next appropriate medical control.

V. Transfer of Care

A. On scene

1. A two or three tier system is designed to provide minimum response times to the maximum area and/ or population. In order to be effective there must be a prompt initial assessment by the 1st response unit, a rapid but appropriate treatment, and a smooth transfer of patient care to the transport unit. This allows for the minimal scene time and the return of the 1st response unit to available status.

2. There will be occasions when the transport medic will need to change the initial assessment and/or treatment plan. This in no way indicates less than optimal assessment or care by the 1st responder, but recognizes that signs and symptoms are dynamic and will change during the course of patient care. Therefore, the following procedures will be applied to the transfer of patient care "on-scene":

   a. The 1st responder will perform an initial assessment and appropriate treatment will be initiated. Common sense, teamwork, and professionalism will be used to ensure optimal patient care.

   b. Transfer of patient care will occur upon arrival of the transport unit's Paramedic; **therefore the transport Paramedic is in charge and ultimately responsible for patient care**.

   c. If additional care is necessary due to the critical nature of the patient, the transporting Paramedic will request continued assistance enroute to receiving facility.

   d. If there is a significant difference of opinion as to proper patient care, it will be decided by online Medical Control or OMD Medical Control Officer(s). A review of the call may include a discussion at a later date by all involved parties and a mutual understanding reached.

B. At Destination

1. There may be difficulties in transferring patient care upon arrival at area hospitals due to the extreme overcrowding, the high volume of EMS calls, and the increased severity of illness of patients. It is therefore imperative that we all work together with a spirit of cooperation in order that the patients receive the best possible care.

2. The following procedures will be applied to the transfer of patient care at destination:

   a. Once on hospital property (ED, Cath Lab, ICU, etc.), the patient is the responsibility of the hospital and staff whether or not official patient transfer has occurred.

   b. Once in the hospital, the PCFR CLINICAL CARE GUIDELINES no longer governs patient care.

   c. Any medications or procedures in progress will be continued until finished unless discontinued by direction of an attending hospital physician. Any new or repeat medications or procedures will be done under the direction of the attending hospital physician using hospital supplies and medications.

   d. If there is a significant change (deterioration) in patient condition, the hospital medical staff must be informed immediately. Please document the person, title, and time contacted.

   e. If any conflict in the above procedure arises, please notify the appropriate Paramedic Battalion Chief or Medical Supervisor immediately.

C. Documentation

1. An Electronic PCR will be generated at the conclusion of each patient encounter. Reference Electronic Patient Care Report Policy 2009-003 dated September 2, 2009. You MUST enter the name of the person receiving the verbal report from you in the Electronic PCR signature section and if possible obtain their signature (Receiving RN/MD signature).

   a. If for a significant reason an EPCR is unable to be completed an abbreviated report, at a minimum shall sufficiently identify, in writing, the crew, patient, vitals signs, chief complaint, treatment, and the times observations were made or treatment was rendered.

2. No copies or patient information will be given to anyone other than the receiving facility. Law Enforcement agencies may be provided copies of reports and/or EKG strips from Refusals, pronouncement of death, Legal Blood Draws, etc, if the following circumstances exist: the officer is performing a death investigation, the patient is under arrest, or incarcerated.

3. In general, extra attention needs to be given for documentation of patient belongings including dentures, large sums of money, weapons, etc along with transfer to who/whom at hospital ER (name preferably). Remember current policy states we do not transport patient medications unless necessary.

D. Suspected Abuse and Neglect

1. INITIAL MEDICAL CARE as indicated.

2. Note environment, patient's interaction with caregivers, discrepancies in the history obtained from patient and caregivers, and any signs of obvious injury.

3. If parents / guardians refuse to let you transport the patient, leave scene and remain in a safe location until aid from law enforcement can be enlist.

4. Transport. It is mandatory to report your suspicions to the ER physician upon arrival.

5. Contact Department Of Children and Families (DCF) **(800) 96A-BUSE**. ALL Paramedics AND EMTs ARE LEGALLY BOUND TO CONTACT DCF IN ALL SITUATIONS THAT ARE SUSPECTED TO BE DUE TO CHILD AND ELDER ABUSE OR NEGLECT.

6. Carefully document history and physical exam findings as well as environmental / circumstantial data on the run report.

Polk County Fire Rescue
Administrative Policies
Radio Report

I. General Information:

A. Stable patients: The goal is to provide a quick synopsis of the patient's condition. Only pertinent information needs to be relayed to the receiving facility. This information should include:

1. Paramedic/EMT name, ALS agency and unit number.
2. Patient age, sex, personal physician if known, and approximate weight in kilograms.
3. Chief complaint.
4. Vital signs:
    a. Blood Pressure
    b. Pulse
    c. Respirations
5. Treatment initiated.
6. Estimated Time of Arrival (ETA).

B. Unstable patients: A radio report should be delivered at least 3 minutes prior to arrival at hospital and a "heads up call" for unstable patients should be given from the scene if warranted and time permits.

II. Physician's Orders (in addition to the above information):

A. State the need for physician's consult or a request for physician's orders.

B. State specific request upfront and provide all supporting information to justify the request (example: requesting orders for Cardizem…I have a 68 y/o male pt…).

C. Level of consciousness (A-V-P-U) and orientation to person, place, time, and incident.

D. Chief Complaint:

1. Pertinent positives: symptoms, and degree of distress.
2. Mechanism of injury / history of present illness / pertinent scene information.
3. Pertinent negatives.

E. Medical History, Medications, and Allergies.

F. Clinical Findings:

1. Assessment findings.
2. Basic and 12-lead ECG assessments.

3. Vital signs:
    a. Blood Pressure: auscultated or palpated.
    b. Pulse: rate, regularity, quality.
    c. Respirations: rate, depth, pattern.
    d. Skin: color, temperature, moisture, and turgor if indicated.
    e. Other pertinent observations.

G. Treatment initiated and patient response.

H. Confirm physician's orders received by repeating information and confirm physician's name or hospital ID number.

I. Update patient status to receiving facility if patient deteriorates.

Polk County Fire Rescue
Administrative Policies
Refusal of Treatment / Transport

I. General:

A. **In all cases, patients presenting with an illness or injury should be approached with the intent to transport. The option of refusal of treatment and/or transport should be a last resort.**

B. Any patient encountered, regardless of their transport status, must have a history and physical exam completed, this include at least one set of vital signs to rule out threats to life.

II. Patient:

A. The definition of a patient is any human that:

1. Has a complaint suggestive of potential illness or injury.
2. Requests evaluation for potential illness or injury.
3. Has obvious evidence of illness or injury.
4. Has experienced an acute event that could reasonably lead to illness or injury.
5. Is in a circumstance or situation that could reasonably lead to illness or injury.

B. All individuals meeting any of the above criteria are considered "patients" in the PCFR System. These criteria are intended to be considered in the widest sense. If there are any questions or doubts, the individual should be considered a patient.

III. Competency:

A. Competency shall be defined as one who is all of the following:

1. 18 years of age or older.
2. Awake, alert, and fully oriented to person, place, time, and incident.
3. Has no signs of injury or illness which may impair the ability to make an informed decision inclusive of the use of drugs and/or alcohol.
4. Has the mental capacity to understand and appreciate the nature and consequences of his/her condition and ability to make rational decisions.
5. Showing no current evidence of bizarre/psychotic thoughts and/or behavior or displaying behavior that is inconsistent with the circumstances of the situation.
6. Shows no current evidence of suicide ideations, suicide attempts, or any indication that they may be a danger to themselves or others.

B. Minors:

1. The following person(s) may consent, or refuse, the evaluation, treatment, and/or transportation of a minor:
   a. Parent
   b. Grandparent
   c. Adult (> 18) brother or sister
   d. Adult (> 18) aunt or uncle
   e. Educational institution in which the child is enrolled that has received written authorization to consent/refuse from a person having the right to consent/refuse

f. Adult who has actual care, control, and possession of the child and/or has written authorization to consent/refuse from a person having the right to consent/refuse (i.e., daycare camps, soccer moms, carpools, etc.)

g. Adult who has actual care, control, and possession of a child under the jurisdiction of a juvenile court

h. A court having jurisdiction over a suit affecting the parent-child relationship of which the child is the subject

i. A peace officer who has lawfully taken custody of minor, if the peace officer has reasonable grounds to believe the minor is in need of immediate medical treatment

j. A managing or possessory conservator or guardian

2. A Provider may be denied access to minor children by a parent or guardian if there is no obvious immediate life threat to the patient. However, in general, parents or guardians cannot refuse life-saving therapy for a child based on religious or other grounds.

3. In certain circumstances, a patient under 18 years of age who has the legal competency and present mental capacity to consent or refuse evaluation/treatment may do so. In such cases, the law states that a person under 18 years of age may consent to evaluation and/or treatment if the person:

   a. Is on active duty with the Armed Services of the United States of America

   b. Is 16 years of age or older and resides separate and apart from his/her parents, managing conservator (an individual appointed by the court, usually during divorce proceedings, to have custody of a minor, to make decisions for the minor and to make a home for the minor), or guardian, with or without the consent of the parents, managing conservator, or guardian regardless of the duration of the residence; and managing their own financial affairs, regardless of the source of the income

   c. Is consenting to the diagnosis and treatment of an infectious, contagious, or communicable disease that is required by law or rule to be reported by the licensed physician or dentist to a local health officer or the Florida Department of Health

   d. Is consenting to examination and treatment for drug or chemical addiction, drug or chemical dependency, or any other condition directly related to drug or chemical use

   e. Is unmarried, pregnant and consenting to evaluation and/or treatment related to the pregnancy

   f. Is unmarried, is the parent of a child, and has actual custody of the child, consenting to evaluation and/or treatment of the child

4. A pregnant minor must have adult consent unless she fits within one of the previously mentioned exceptions.

5. When treating minors, it is important that there be an interactive process between them and the provider. The interaction should involve developmentally appropriate disclosure about the illness/injury, the solicitation of the minor's willingness and preferences regarding treatment, and decision options. Although the intent of this interaction is to involve the child in decisions, the way in which the participation is framed is important. As with any patient, minors should be treated with respect.

C. When a patient is refusing treatment or transport and fails to meet the above competency criteria, law enforcement, field supervision, and/or medical control must be actively consulted and participate in determining the outcome. Medical Control and Field supervision must be contacted prior to any patient being treated and/or transported against their will.

Polk County Fire Rescue
Administrative Policies
Refusal of Treatment / Transport

IV. Consent:

A. With certain exceptions (see Implied Consent) all adult patients and select minor patients have a right to consent to medical evaluation and/or treatment. If they have the legal competency and present mental capacity to do so. There are three specific forms of consent that apply to EMS: Informed Consent, Implied Consent, and Substituted Consent.

B. Informed Consent:

1. Informed consent is more than a legality. It is a moral responsibility on the part of the Provider, based in the recognition of individual autonomy, dignity, and the present mental capacity for self-determination.
2. With informed consent, the patient is aware of, and understands, the risk(s) of any care provided, procedures performed, medications administered, and the consequences of refusing treatment and/or transport.
3. They should also be aware of the options available to them if they choose not to accept evaluation and/or treatment.

C. Implied Consent:

1. In potentially life-threatening emergency situations, consent for treatment is not required. The law presumes that if the individual with a real or potential life-threatening injury or illness were conscious and able to communicate, he/she would consent to emergency treatment.
2. In life-threatening emergency situations, consent for emergency care is not required if the individual meets any of the following criteria:
    a. Unable to communicate because of an injury, accident, illness, or unconsciousness and suffering from what reasonably appears to be a life-threatening injury or illness
    b. Suffering from impaired present mental capacity
    c. A minor who is suffering from what appears to be a life-threatening injury or illness and whose parents, managing or possessory conservator, or guardian is not present

D. Substituted Consent:

1. This is the situation in which another competent adult consents for the patient, as in minors, incapacitated patients, incarcerated patients, and those determined by courts to be legally incompetent.
2. Parents or guardians are entitled to provide permission because they have the legal responsibility. In the absence of abuse or neglect, it is assumed they act in the best interests of the child. However, there is a moral and ethical “need to respect the rights and autonomy of every individual, regardless of age.”
3. Incarcerated: Law Enforcement

Polk County Fire Rescue
Administrative Policies
Refusal of Treatment / Transport

V. Restraint / Transport Against Will:

A. If, based on Provider assessment, the patient is not capable of making an informed decision AND the patient has a potentially harmful illness or injury, the patient should be extensively counseled regarding the need for medical care.

B. If the patient STILL refuses further care/evaluation, or is a harm to (him/her) self or others, the patient should be physically restrained by EMS personnel with law enforcement assistance, if available.

1. PHYSICAL RESTRAINTS (Refer to PHYSICAL RESTRAINT PROCEDURE GUIDELINE) should be safe & humane. At NO TIME should a patient be struck or managed in such a way as to impose pain. Restrain in a position of comfort and safety.
2. Thoroughly document on the EPCR the reason for restraint, the mental status exam, options attempted, and method of restraint (no exceptions).
3. If CHEMICAL RESTRAINT is deemed necessary, refer to the PSYCHOLOGICAL & BEHAVIORAL EMERGENCIES PROTOCOL.
4. Patients should be monitored every 5-10 minutes during either, restraint period, and findings documented on EPCR. Never leave a patient alone after any form of restraint.

VI. Close call / cancelled enroute:

A. During mutual response to a scene, the first arriving unit will determine the need for treatment and/or transport. If conditions exist where the patient meets refusal criteria, the first arriving unit will cancel incoming units and must obtain refusal documentation.

B. No refusal needs be taken by the units that were cancelled. If there are any questions or concerns about the assessment or competency of the patient, the ALS unit should not be cancelled.

VII. Public Assist:

A. If a transport unit arrives on-scene of an incident in which a well-being check or assistance in moving is requested and other public safety units are on scene, only one unit is required to generate documentation of the call. If the transport unit is the sole unit on scene, a refusal of treatment/transport must be generated.

VIII. Hypoglycemia:

A. There may be times when patients are refusing further treatment or transport after a corrected hypoglycemic episode.

B. These patients will be allowed to refuse transport if all of the following criteria are met:

1. There is a documented low glucose reading pre-treatment and a normal glucose reading post treatment.
2. The patient is awake, alert, and oriented x 4 post treatment (understands current situation).
3. The patient is not going to operate any moving vehicle or equipment immediately following treatment.
4. There is another competent adult who will assume the responsibility of caring for the patient for the next 1-2 hours or no decrease in glucose reading (second normal reading) after 30 minute period.
5. There are no other underlying medical or trauma conditions requiring treatment at the time of service.

IX. Refusal of Treatment or Transport:

A. **IF THE PATIENT IS REFUSING ANY CARE OR TREATMENT DETERMINED TO BE BENEFICIAL AS PRESCRIBED IN THESE PROTOCOLS, MEDICAL CONTROL WILL BE NOTIFIED FOR DIRECTION AND THE PATIENT WILL BE INFORMED OF THE POSSIBLE CONSEQUENCES OF THIS WITHHOLDING OF CARE**. The patient must sign the PCR

acknowledging his/her understanding of the decision with complete documentation of the specific care refused.

B. If the competent patient refuses transport, a patient care report (PCR) must be completed, inclusive of the patients informed refusal signature. This will be done on all patients with an illness or injury that are refusing service, regardless of how the call was received (911 request, still-alarm, third party caller, etc.). If an incident occurred that prompted the 911 call and symptoms resolved prior to patient contact, a PCR must still be written to document the incident and the patient's refusal of service.

X. Rejection or inability to sign refusal

A. The patient (or parent or guardian) who is judged competent to refuse care and then refuses to sign the refusal form should prompt the crew to reassess the competency of the individual. If still considered competent to refuse care, such refusal must be documented on the PCR and preferably witnessed by law enforcement. Field supervision must be involved in the determination of this call.

B. If the patient (or parent or guardian) is unable to sign refusal paperwork, such inability must be documented on the PCR and witnessed by law enforcement or field supervision.

Polk County Fire Rescue
Administrative Policies
End of Life Issues

It is the goal of PCFR to provide the best possible care to all patients who are in need of service. For those patients who are found in cardiopulmonary arrest, the Paramedic should examine the circumstances surrounding the event and take appropriate action as determined by the situations listed below. If END OF LIFE is determined, further supportive care should be given to the family on scene so they are better able to cope with this event. Assistance might include, but not be limited to, notification of the patient's physician, Hospice if applicable, and funeral home. Patients who deteriorate into cardiopulmonary arrest in the presence of rescue personnel, or for whom cardiopulmonary resuscitation is in progress prior to the arrival of rescue personnel, will receive cardiopulmonary resuscitation.

I. Discontinue Cardiopulmonary resuscitation when:

A. Effective spontaneous ventilation and circulation have been restored.

B. Resuscitation efforts have been transferred to persons of no less skill than the initial providers.

II. Cardiopulmonary resuscitation may be <u>TERMINATED</u> in non-hypothermic adults provided all the following criteria have been met:

A. The patient was initially found asystolic in 2 or more leads.

B. No defibrillation was performed prior to arrival (AED use by first responders).

C. Secure airway (iGEL Supraglottic Airway) confirmed by capnography.

D. Vasopressor Agent (Vasopressin or Epinephrine) **x 2**.

E. If there is no response to the above treatment, the Paramedic may elect to discontinue resuscitative efforts without a physician's order provided all EMTs and Paramedics on scene agree; otherwise resuscitative efforts will continue.

F. If there are any deviations from the above criteria, CESSATION OF RESUSCITATION MUST BE MADE IN CONJUNCTION WITH MEDICAL CONTROL.

G. **IF IN DOUBT CONTINUE, ALL RESUSCITATIVE EFFORTS!**

III. Cardiopulmonary resuscitation may be <u>WITHHELD</u> provided all the following criteria are met:

1. Pulseless, apneic, no other signs of life **and**
2. Asystole verified in two leads **and**
3. Not exposed to an environment likely to promote hypothermia

OR

4. Pulseless, apneic, no other signs of life **and**

The presence of one or more of the following:

- Rigor Mortis
- Decomposition of body tissues
- Dependent lividity
- Incineration
- Evidence of massive blunt or penetrating head or torso trauma including decapitation (details of the events of the mechanism of injury, scene, and patient assessment must be completely documented).

Polk County Fire Rescue
Administrative Policies
End of Life Issues

IV. Cardiopulmonary resuscitation may be <u>WITHHELD</u> or <u>WITHDRAWN</u> from a patient:

A. When presented with a State of Florida DNR form or State of Florida Yellow DNR device which is a miniature copy of the DNR form. **NOTE: This Form Does Not Expire**.

1. The form must be properly completed, including physician signature.
2. This form shall be printed on yellow paper. A copy of this form may be made so long as rescue staff has witnessed the validity of the yellow original.

B. When presented with a DNR written by a physician (who is verifiably licensed in the State of Florida). **NOTE: These Form Expires 30 days from the day it is written and generally created in hospital.**

C. When a physician is on scene (who is verifiably licensed in the State of Florida) who is willing to write a DNR. The physician must provide a rationale for the DNR and state their relationship to the patient. This information must be recorded in the PCR along with the physician's signature.

During each transport, the DNR form shall accompany the patient. A DNR may be revoked at any time. The revocation may be in writing, by physical destruction, by failure to present the DNR form or by orally expressing a contrary intent. The DNR may be revoked by:

A. The patient (if signed by the patient)

B. The patient's healthcare surrogate

C. The patient's proxy, court appointed guardian, or Power of Attorney

Even with a DNR form, the patient shall be provided medically indicated care, comfort, or pain relief (i.e. oxygen administration, CPAP, etc.) unless the patient is in respiratory or cardiac arrest.

Pallitive Care parameters for time period prior to Respiratory Arrest and patient has DNR as noted above.
Based on SAO2% or Respiratory rate.

SAO2 %		RESPIRATORY RATE	TREATMENT
90-100		>9	NRBM
80-89	**OR**	7-8	BVM
<79		<6	INTUBATE

INTUBATION OF PATIENT SHOULD BE BASED ON THE MOST UNSTABLE CLINICAL SIGN

IF PATIENT BECOMES APNEIC AND PULSELESS HONOR DNR STATUS/CHOICE!!

V. **Document original body position and location,** Disposable supplies (i.e., EKG electrodes) will be left in place. Contact Law Enforcement regarding patient body care and removal.

Polk County Fire Rescue
Administrative Policies
Physician on Scene

Medical control of the scene of an emergency should be the responsibility of the individual in attendance who is the most appropriately trained in providing pre-hospital stabilization and transport. As an agent of the Medical Director the Paramedic represents that individual.

Occasions will arise when a physician on the scene will desire to direct pre-hospital care. A standardized plan for dealing with these contingencies will optimize the care given to the patient.

I. The physician desiring to assume care of the patient must:

   A. Provide documentation of his status as a physician (M.D. or D.O.)

   B. Be licensed to practice medicine in the State of Florida.

   C. Document his or her assumption of care on the patient care report (PCR).

II. Contact with Medical Control at the receiving facility must be established as soon as possible. The physician assuming responsibility at the scene should be placed in contact with the Medical Control Physician and acknowledgment of his or her acceptance of responsibility confirmed.

III. Orders provided by the physician assuming responsibility for the patient should be followed as long as they do not, in the judgment of the Paramedic, endanger the patient well-being. The Paramedic may request the physician to attend the patient during transport if the suggested treatment varies significantly from the PROTOCOLS.

IV. If the physician's care is judged by the Paramedic to be potentially harmful to the patient, the Paramedic should:

   A. Politely voice his or her objections.

   B. IMMEDIATELY place the physician on the scene in contact with Medical Control for resolution of the problem.

   C. When conflicts arise between the physician on the scene and Medical Control, rescue personnel should follow the directives of the Medical Control Physician. Offer no assistance in carrying out the order in question, but provide no resistance to the physician performing this care. If the physician on scene continues to carry out the order in question, offer no assistance and enlist aid from law enforcement.

V. All interactions with physicians on the scene must be completely documented in the patient care report (PCR).

Polk County Fire Rescue
Administrative Policies
General / Scene Transport

I. Routine Transport:

A. The receiving facility must be equipped with an Emergency Room unless arrangements have been cleared through the Field Supervisor and the receiving facility.

B. STABLE PATIENT:

1. Patients that verbally request ambulance transport to a facility that is not the closest and/or most appropriate facility to the scene location will be transported to their requested facility if the patient's medical condition is such that transport will be made without perceived untoward consequences to the patient. In order for a patient to verbally request such transport, the patient will need to indicate to PCFR that a physician-patient relationship exists by providing the name of their (PCP) primary care physician OR Specialist. A patient's (PCP) is not an Emergency Department physician or a hospitalist.
Common sense plays a large role in these situations, if discussion fails transport to patient choice.

2. If the selected hospital is outside Polk County Fire Rescue' coverage area, notify the Field Supervisor of the request and destination. The coverage area is defined by the following hospitals:

Hospital Name:	Address:	City:
Bartow Regional Medical Center	2200 Osprey Blvd.	Bartow
Brandon Regional Medical Ctr	119 Oakfield Dr	Brandon
Celebration	400 Celebration Pl.	Celebration
Heart of Florida Regional Medical Ctr	40100 US Highway 27	Davenport
Florida Hospital Heartland	4200 Sun n Lake Blvd	Sebring
Lake Wales Medical Center	410 11th St S	Lake Wales
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland
Osceola Regional Medical Center	700 West Oak Street	Kissimmee
Poinciana	325 Cypress Parkway	Poinciana
South Florida Baptist Hospital	301 N Alexander St	Plant City
Winter Haven Hospital	200 Ave F NE	Winter Haven

Polk County Fire Rescue
Administrative Policies
General / Scene Transport

Emergency Transport:

C. UNSTABLE PATIENT:

1. All patients whose condition meets the definition of UNSTABLE will be transported to the closest appropriate receiving facility. If several hospitals are within the same approximate distance from the scene (regardless if the hospital is within the catchment area), allow the patient and/or patient's family to select the closest appropriate receiving facility of their choice.
2. Refer to TRAUMA TRANSPORT, CARDIAC TRANSPORT or STROKE TRANSPORT ADMINISTRATIVE POLICIES where an appropriate facility is necessary for these specific circumstances.
3. Rapid transport may be indicated if circumstances demand for definitive hospital care. If the situation warrants, DO NOT delay at the scene. If there is a delay each case will be unique and a compelling reason MUST be documented.
4. EXAMPLES OF EMERGENCY TRANSPORT SITUATIONS INCLUDE BUT ARE NOT LIMITED TO:
    a. Inability to establish or maintain a patent airway or effective ventilations.
    b. Complicated obstetrical.
    c. Respiratory arrest.
    d. Cardiac Arrest, if patient may significantly benefit from rapid transport.
    e. Massive internal / external hemorrhage with shock.
    f. Unstable pediatric
5. Note:
    a. The use of emergency transport must be weighed against the potential injury to both the patient and rescue personnel and the possible benefit to the patients' condition. The few minutes that this type of transport may gain must be significantly more beneficial than the added stress and potential for injury to both the patient and rescue personnel.
    b. If the patient and/or patient's family refuses transport to the closest hospital(s), notify Medical Control and Field Supervisor of the situation.

D. Walking of patients to transport unit or stretcher

As a general rule transportation is expected when 911 is summoned. With this in mind, patients should not walk/be assisted to the transporting unit or stretcher (any further than absolutely necessary). Certain exceptions may apply such as the patient meeting unit at roadside, mass casualty incidents with walking wounded and the patient's insistence of walking (must be documented thoroughly). Instances where the patient should never walk include but are not limited to respiratory difficulty or history of such, cardiac event or history, inability or claim of inability and any time at which a patient should not exert themself.
Common sense plays a large role in these situations, if in doubt don't walk or exert the patient.

Polk County Fire Rescue
Administrative Policies
Interfacility Transport

The PCFR Interfacility Transport Policy has been created to assure that all ambulance transfers between acute care hospitals and other facilities, as approved by the PCFR Medical Director, are arranged in a manner that maximizes patient safety. ***At the current time PCFR only commits resources to Emergency Transfers as approved by Medical Supervision but all are listed here as a guide for information.***

DEFINITIONS:

1. **Advanced Life Support (ALS)** – pre-hospital emergency medical care rendered by a professional with an EMT-Paramedic (EMT-P) licensure.

2. **Basic Life Support (BLS)** – pre-hospital emergency medical care rendered by a professional with an EMT-Basic (EMT-B) licensure or an EMT-Paramedic licensure.

3. **Hospital Personnel** – licensed professionals whose skill sets may be necessary to complete particular transfers (i.e. registered nurses, respiratory therapists, and physicians).

4. **Interfacility Transport** – the prearranged transportation of emergent or non-emergent patients between health care facilities.

5. **PCFR Clinical Care Guidelines** – policies, procedures, and protocols set forth by the PCFR Medical Director for which all EMTs and Paramedics employed by PCFR must abide by.

6. **Medical Direction** – any one of the "sending facility," "receiving facility," or "transporting agency" physicians designated to approve the activities of an EMT or Paramedic performing skills in the pre-hospital setting or during interfacility transportation.

7. **Pre-Interfacility Transport** – the time in which the "Sending" facility physician determines the need for patient transport. The "Receiving" facility must be contacted and arrangements are made. Upon confirmation of the transfer between the two hospitals, the sending physician should then determine the "Mode of Transport" either ALS or BLS in nature and emergent or non-emergent.

8. **Receiving Facility** – the facility that will ultimately accept the patient once the interfacility transport is complete.

9. **Sending Facility** – the facility that initiates the patient interfacility transport.

10. **Transferring Agency** – the service responsible for the interfacility transport of the patient from the Sending facility to the Receiving facility. (i.e. Polk County Fire Rescue)

11. **Transfer Agreement** – a written understanding between a facility and a private interfacility transport service that holds a current COPCN to conduct business in Polk County with regards to the service's specific scope of practice, the level of care available, and the responsibility for medical direction.

SENDING FACILITY RESPONSIBILITIES

The sending facility is responsible for initializing safe interfacility patient transfer. It is also the sending facility's responsibility to select the appropriate level of patient transfer (i.e. BLS or ALS). The sending facility will also provide the PCFR Paramedic a report and all pertinent patient records including a complete medical history, current treatments in progress, and medication being administered. The sending facility will also provide any necessary equipment, medication, and/or qualified **APPROPRIATE** personnel in the event that patient care dictates it for transport. (*See Hospital Personnel*)

TRANSFERRING AGENCY (PCFR)

Upon patient contact the lead ALS provider/Paramedic will complete a thorough patient assessment. From this evaluation the Paramedic will make the determination as to whether the patient meets criteria for either emergent or non-emergent transport.

Polk County Fire Rescue
Administrative Policies
Interfacility Transport

On the occasion that the sending facility physician and the transporting Paramedic disagree on the transport status of the patient, the PCFR Medical Director or designee will make the final decision utilizing information provided by the sending facility physician and the Paramedic.

AMBULANCE TRANSPORT OPTIONS
Two transporting options are available for patient transfer between acute care facilities:

1) Non-Emergency Interfacility Transfers
2) Emergency Interfacility Transfers

Non-Emergency Interfacility Transfer patients may be attended to by either an EMT-Basic (EMT-B) or an EMT-Paramedic (EMT-P) depending on the status of the patient. All PCFR ambulances maintain a staff of at least one (1) EMT-P and one (1) EMT-B crew. On occasion, two (2) Paramedics may be staffed on a transport unit. On all non-emergency transports, the Paramedic will ultimately make the decision as to who will tend to the patient during transport. Transport decisions will be based on the report given by the sending facility staff, the findings of the Paramedic's assessment, and the scope of practice for each of the PCFR crew members.

Emergency Interfacility Transfer patients will always be attended to by a PCFR Paramedic. Hospital personnel may be asked to assist in the emergent transport if deemed necessary by the sending facility and/or the PCFR transporting crew.
The scope of practices of EMT-Basics and EMT-Paramedics are limited and structured by Florida State Statute, Florida Administrative Code and by the PCFR Clinical Care Guidelines.

BLS NON-EMERGENT INTERFACILITY TRANSFERS
This form of transport is for any patient for whom the sending facility physician deems care to be BLS appropriate. This level of service is appropriate for stable patients who fall within the scope of practice of an EMT-B per the State of Florida and the PCFR Clinical Care Guidelines. If the Paramedic's assessment also deems the patient to be within the scope of practice for an EMT-B, then the EMT-B will tend to the patient during transport. Prior to transport the EMT-B will complete the following:

- Obtain the patient's face sheet
- Obtain the Certificate of Transport
- Obtain permission to transport from the sending facility
- Obtain and document a set of vital signs prior to leaving the facility or if unable to record a set of vital signs, document why they were unattainable
- Obtain and document all patient belongings including medications
- Document patient condition during transport and if the condition deteriorates or a significant change takes place, consider ALS intervention
- Call report to the appropriate receiving facility if not already completed by sending facility staff

ALS NON-EMERGENCY INTERFACILITY TRANSFERS
This form of transport is for any patient for whom the sending facility physician deems care to be ALS appropriate. This level of service is appropriate for stable patients that fall within the scope of practice of an EMT-P per the State of Florida and the PCFR Clinical Care Guidelines. If the Paramedic's assessment also deems the patient to be within the scope of practice for an EMT-P then the Paramedic will tend to the patient during transport. For all ALS interfacility transports the EMT-P will:

- Conduct a complete ALS assessment prior to accepting the patient transfer
- Obtain a complete verbal report from the sending facility staff to include:
  - Age and sex of the patient
  - Diagnosis of the patient
  - Reason for transfer
  - Any advanced procedures completed
  - Document all medications and equipment necessary

Polk County Fire Rescue
Administrative Policies
Interfacility Transport

- Level of consciousness and vital signs
- Brief history and sending facility patient assessment
- Complete steps listed under BLS transfers above

For all non-emergency transfers, the sending facility physician should keep in mind that the minimum staffing level of all PCFR ambulances is one (1) Paramedic and one (1) EMT. This level of transport may not be appropriate for patients with complex monitoring and/or treatment requirements (i.e. balloon pumps, imminent neonatal births, simultaneous administration of multiple critical care medications).

EMERGENCY INTERFACILITY TRANSFERS
This form of transport should be utilized for the IMMEDIATE transfer of patients requiring emergency care not available at the sending facility AND where time to definitive care is critical. It is the intent to transport patients to the nearest most appropriate medical facility for the timely care of the patient in a medical facility staffed, equipped, and prepared to administer care for the patient. (Examples are ER to ER and ER to Cath Lab/Surgical Unit but never ER to Room.)

At no time should the sending facility upgrade a patient's status to EMERGENT in order to hasten the arrival of the PCFR transport vehicle if the situation does not warrant. Patients must meet emergent transfer criteria after the lead Paramedic completes his/her patient assessment. If the lead Paramedic does not agree with the transport status of the patient then he/she will contact the PCFR Chain of Command, up to and including the PCFR Medical Director, for further direction on how to proceed with the transfer.

PCFR transporting units awaiting an emergency transfer should not be expected to wait at the sending facility for more than 10 minutes while a patient is being prepared for transport. After 10 minutes, the crew may elect to contact PCFR Communications and return their unit to 9-1-1 service.

Paramedic / HOSPITAL PERSONNEL TRANPORTS
The sending facility should be prepared to send APPROPRIATE personnel and equipment if patient care required during transport is beyond the scope of practice of the transporting Paramedic.

On occasion in the best interest of patient care, it may be necessary for the PCFR crew to request additional personnel to accompany the patient during an interfacility transport (i.e. RN, RT, Dr. or as directed by the sending or receiving facility). Responsibility for the patient during transport rests primarily with the PCFR Paramedic while the hospital personnel maintain responsibility within their individual scopes of practice.

If a physician accompanies the patient during transport, any orders received during transport must be written, dated, and signed by the physician prior to transfer of care at the receiving facility. The physician is responsible for overall patient care and the PCFR Paramedic is responsible for their own care within their scope of practice.

MEDICAL DIRECTION
The responsibility of medical direction during transport should be established prior to the interfacility transport. The sending and receiving facility physicians should direct what care needs to be continued during transport via standing orders. If unforeseen life threatening issues arise during transport (i.e. imminent cardiac arrest, cardiac arrest, seizures, anaphylaxis, etc.), then the transporting Paramedic should consult the PCFR Clinical Care Guidelines for treatment options and consultation with the PCFR Medical Supervisor should be utilized if necessary. PCFR crews have the ability to abort the interfacility transfer in this situation and transport the patient to the nearest acute care hospital.

FAMILY TRANPORT
During emergency transport, it is highly recommended that family should travel separately when a patient is being transported emergently. Family should be cautioned not to follow the ambulance as this can be hazardous to both the family and the PCFR ambulance occupants especially when the ambulance is utilizing lights and sirens. It should be further explained that families must obey all traffic laws if in fact they choose to follow a PCFR ambulance during lights and sirens transport.

Polk County Fire Rescue
Administrative Policies
Interfacility Transport

On occasion exceptions are made for particular family members. If a single family member does accompany the patient on an emergent transport, the individual must be seat belted in the front driver's compartment along with the driver. No family members should be transported in the patient compartment area unless warranted by the lead Paramedic for patient care purposes (i.e. parent of child, interpreter, etc.). It is the lead Paramedic's discretion to approve/deny transport of patient family.

ENDANGERMENT OF TRANSPORTING CREW

In the event that the PCFR crew feels that it would be unsafe to perform the interfacility transfer (i.e. lack of qualified personnel, inadequate equipment, violent patient, weather conditions, etc.) they should immediately notify the PCFR Chain of Command (i.e. Medical Supervisor, Battalion Chief (Paramedic), Medical Training Officer) and the sending physician about their concerns.

All personnel should work together to find an acceptable solution prior to taking the transfer. The PCFR Medical Director or designee has the definitive say as to whether or not the PCFR crew is permitted to take the interfacility transport. If this situation were to occur, it would be the responsibility of the sending and/or receiving facilities to arrange transport of the patient by other means (i.e. Critical Care Transport (CCT), NICU transport, Flight transport, etc.).

DOCUMENTATION

All interfacility transfers involving PCFR crews are subject to PCFR Quality Assurance review. PCFR crew members are expected to maintain an accurate transport record on the patient to include: patient demographics, medical history, assessment findings, medications, allergies, physical exam, vital sign trends, and treatment. Crews should also include sending physician orders as well as any other orders given by other physicians (i.e. PCFR Medical Director, receiving facility physician).

REQUESTS FOR INTERFACILITY TRANSPORTS

NON-EMERGENCY INTERFACILITY TRANSPORT

Scheduled or pre-arranged interfacility transports should be made by contacting the PCFR Communications Center. Due to the high demand of calls local hospitals are asked forecast the number of possible non-emergency interfacility transports for the day. This allows the PCFR Communications Center the ability to properly schedule and manage these forecasted transports in an effort to minimize interfacility transport delays and maximize PCFR 9-1-1 area coverage.

EMERGENCY INTERFACILITY TRANSPORT

Emergency interfacility transports will be assigned to a PCFR transport vehicle regardless of time. It is important to understand that with a high call volume system there may be delays getting the transport vehicle to the hospital. PCFR will attempt to make these delays as minimal of an impact on the sending facility and the patient as possible. If these circumstances arise, PCFR will advise the sending facility of the situation.

Requests for PCFR service from all other facilities including physician's offices, clinics, urgent care centers, nursing homes, etc. will be considered either "**EMERGENCY**" or "**NON-EMERGENCY**" transport calls but not "**INTERFACILITY TRANPORTS.**" These facilities must utilize the 9-1-1 system or the PCFR non-emergency phone number should they require emergent or non-emergent transport services.

Polk County Fire Rescue
Administrative Policies
Aeromedical Transport

I. Determine potential need for aeromedical transport of the patient.

II. Criteria that suggest the need for aeromedical transport may include, but are not limited to:

A. Need for ALS services where none are available or will be significantly delayed.

B. Mass casualty incidents.

C. Prolonged extrication.

D. Insufficient numbers of rescue personnel, equipment, or vehicles to manage a multiple casualty incident or single patient encounter.

E. Traffic conditions or geographic terrain that prohibits adequate ground access to the victim.

F. Patient has suffered:

1. Crushing or maiming injuries to the hand or foot
2. Injuries that may require significant neurovascular surgery
3. Injuries that may require extensive cosmetic surgical procedures

G. Situations in which the time differential between air and ground transport may substantially impact the outcome of the patient (Cardiac Alert, STEMI Alert, SAH or Stroke Alert).

H. Patients who meet the "Trauma Alert" criteria as specified by the Florida Administrative Code 64J-2 and in whom the time differential between air and ground transport may substantially impact the outcome of the patient.

III. The Paramedic in charge of the patient is responsible for determining if aeromedical transport is warranted. The Paramedic should notify the Communications Center of the need for aeromedical transport as soon as possible in order to minimize response and transport times. The Paramedic in charge should also request for assistance from other agencies as needed to help secure the incident site and landing zone. The Communications Center will advise the priority channel on which ground to air communications will occur.

IV. If initial indications are that air transport may be required, the air transport should be allowed to progress towards the scene in order to decrease response times.

V. Through an agreement by PCFR and the Polk County Fire Chief's Association, an incident command system shall be used on all air support situations. In the event no fire personnel are available for a given incident, rescue personnel will assume command. Once both agencies are on scene, a Unified Command shall be established. The Incident Commander/ Manager shall be responsible for the following: initiating the request for Air Support to dispatch, designating a LZ Safety Officer, determining the necessary additional resources and terminating the incident.

VI. Guidelines for Landing Zone Preparation are as follows:

A. Area should be at least 125 ft. X 125 ft. (day or night), on fairly solid ground, level, free of overhead obstruction, ground obstructions, people and any material which might fly loose. If there are obstructions, inform helicopter crew via radio. THE HELICOPTER PILOT MAKES THE FINAL DETERMINATION FOR A SAFE LANDING ZONE, (LZ).

B. The LZ should be at least 100 ft. away from any patient care activities if the patient is not in the back of an ambulance.

C. The maximum acceptable ground slope is 5 degrees.

D. Mark the four corners of the LZ with lights or EZ-LZ Landing kits.

E. The best way to mark the landing position in the LZ at night is to use two vehicles with low headlights ON, shining across the LZ with the intersection of the beams at the landing point. Turn headlights OFF after landing.

F. Do not shine lights directly at the aircraft.

G. Keep spectators at least 200 feet from the touchdown area and emergency personnel at least 100 feet away. Do not allow anyone to approach the helicopter after landing.

H. The LZ Safety Officer should be clearly identified day or night with either an orange vest or traffic control flashlight and must be wearing eye protection. The LZ Safety Officer should have radio contact with the helicopter via the LZ channel when applicable and is responsible for directional information.

I. Once the patient is packaged and ready to load, the helicopter crew may request up to 4 personnel to assist loading. When approaching or departing the helicopter, be aware of the tail rotor. Remain low at all times and follow the crew's directions for safety.

J. **ALL patients transported under this Administrative Policy will be transported to the closest appropriate and capable facility with consideration only given to weather for exceptions.**

Refer to specific **time consideration** in each protocol for fly/no-fly and destination determination.

Written boundary for fly/no-fly zone in reference to Trauma Alerts (flight map on pg 5-41) is as follows:

• The South boundary will remain Highway 60 from County Line Rd. to Highway 17 in Bartow; Highway 17 North to the Peace River Bridge;

• The East boundary will be Thornhill Rd. one mile South of C.R. 540 / Winter Lake Rd.; C.R. 540 / Winter Lake Rd. one mile East of Thornhill Rd.; North from 42nd street and Recker Hwy along 42nd Street to Old Lake Alfred Road (Five Points) along the East side of Lake Ariana and North along C.R. 559 until it crosses over C.R. 557- A;

• The North boundary is north of Polk City (north of Yamaha Lane) and will then turn to the Northwest East of Moore Road to the western boundary of Polk and Pasco County on Highway 471.

Polk County Fire Rescue
Administrative Policies
Trauma Transport

I. Dispatch Procedures

Communications Centers: Polk County Fire Rescue Communications Center is located in Polk County. All EMS calls for the county are received by and dispatched by this center along with several fire departments in Polk County. Enhanced 911 is being utilized in county and are processed by using a computer aided dispatch system.

A. The list of information to be obtained from caller

1. Location and phone number of patient.
2. Type of injury; Trauma
3. Age of patient.
4. Is patient conscious? Is patient breathing?
5. Is there any serious bleeding? Is he/she completely alert?
6. What part of the body was injured? Chest or neck; is he/she having difficulty breathing? Amputation; have the parts been found? When did this happen?
7. Fall; how far did he/she fall? What caused the fall?
8. Vehicle accidents; is anyone pinned? Was anyone thrown from the vehicle? Obvious injuries or serious bleeding?
9. GSW – explosive to head; do you think patient is beyond any help (resuscitation/CPR)? Is assailant still nearby?
10. Scene safety verification for patient and responding unit

B. **Method used to identify and dispatch the most readily available unit**

1. The Emergency Medical Services dispatcher will dispatch the closest available unit(s).
2. Prior to the first unit's arrival, multiple response units may be dispatched by request of the Communications Supervisor or Field Supervisor based on information received from caller(s). The first unit arriving on scene can request multiple response units.
3. The Field Supervisor will be dispatched to any trauma alert or possible trauma alert and vehicle accident.

C. **Process used to request assistance from emergency response agency**

1. It is recommended that the fire departments respond to all vehicle accidents, trauma alerts and unconfirmed trauma alerts.
2. Law enforcement is requested to respond to all vehicle accidents, and violent or potential violent crimes.
3. Air support is requested by the Paramedic or on scene Fire Department Officer where a Paramedic is not yet on scene. In addition, the Communications Supervisor or Field Supervisor can request air support prior to an EMS unit's arrival based on information received from caller(s).
4. Public utility agencies are requested when need is identified.

D. **Polk County Fire Rescue Advanced Life Support units and Field Supervisors will be dispatched on recorded medical and fire channels. All other requests for an emergency response agency will be made on recorded phone lines.**

E. **THE CLOSEST AVAILABLE HELICOPTER WILL BE DISPATCHED TO THE SCENE IN ACCORDANCE WITH ESTABLISHED DISPATCH PROTOCOLS.**

Polk County Fire Rescue
Administrative Policies
Trauma Transport

II. Adult Trauma Triage Criteria:

Upon arrival at the scene, the crew will initiate Initial Trauma Care and a Primary Survey to assess the patient(s) using the following methodology as outlined in 64J-2.017 Florida Administrative Code. Those patients with anatomical and physiological characteristics of a person sixteen (16) years of age or older that meet the following criteria will be classified as a "trauma alert" patient and will be transported according to Section IV of this TTP.

A. **Patient presenting with:**

RED = any one (1) - transport as a trauma alert; BLUE = any two (2) - transport as a trauma alert; GREY = Ground transport to trauma center ("Trauma Grey")

	RED	BLUE	GREY
AIRWAY	ACTIVE AIRWAY ASSISTANCE[1] or RESPIRATORY RATE <10 or >29 BPM		
CIRCULATION	LACK OF RADIAL PULSE or BP <90 mmHg BP<110 IN PATIENT OVER 65 YEARS		
DISABILITY	GCS ≤ 13 or PRESENCE OF PARALYSIS, or SUSPICION OF SPINAL CORD INJURY or LOSS OF SENSATION	HEAD INJURY WITH LOSS OF CONSCIOUSNESS, AMNESIA or NEW ALTERED MENTAL STATUS	
SOFT TISSUE	2ND OR 3rd DEGREE BURNS TO 15% or MORE TBSA AMPUTATION PROXIMAL TO THE WRIST or ANKLE ANY PENETRATING INJURY TO HEAD, NECK, or TORSO[3] CHEST WALL INSTABILITY or DEFORMITY (FLAIL CHEST)	SOFT TISSUE LOSS[2] or PENETRATING INJURY TO THE EXTREMITIES DISTAL TO THE ELBOW or DISTAL TO THE KNEE	
LONG BONE FRACTURE/ SKELETAL[4]	FRACTURE OF TWO or MORE LONG BONES[4]	SINGLE LONG BONE FX SITE DUE TO MVC[4]	
AGE			55 YEARS or OLDER
MECHANISM OF INJURY	PENETRATING INJURY TO THE EXTREMITY AT or PROXIMAL TO ELBOW or KNEE	EJECTION (PARTIAL or COMPLETE) FROM AUTOMOBILE DEATH IN SAME PASSENGER COMPARTMENT INTRUSION INCLUDING ROOF >12 INCHES OCCUPANT SITE; >18 INCHES ANY SITE INTO THE PASSENGER COMPARTMENT VEHICLE TELEMETRY DATA CONSISTENT WITH HIGH RISK OF INJURY[5] FALL 20 FT or MORE AUTO VS. PEDESTRIAN/BICYCIST THROWN, RUN OVER or WITH IMPACT GREATER THAN 20 MPH MOTORCYCYLE CRASH >20mph PREGNANCY >20wks WITH ABDOMINAL PAIN AND BLUNT TRAUMA	BLUNT HEAD, CHEST, ABDOMINAL, MUSCULAR SKELETAL TRAUMA IN PATIENT ON ANTICOAGULANTS OR BLEEDING DISORDERS BLUNT ABDOMINAL or CHEST TRAUMA IN PATIENT WITH HISTORY OF PARALYSIS (PARAPLEGIA or QUADRIPLEGIA) EITHER ELECTROCUTION or LIGHTNING WITH LOSS OF CONSCIOUSNESS or VISIBLE SIGNS OF INJURY SEATBELT MARK ON TORSO

1. Airway assistance includes manual jaw thrust, continuous suctioning, or use of other adjuncts to assist ventilatory efforts.
2. Crushed, Major de-gloving injures, mangled extremity or deep flap avulsion (>5 in.)
3. Excluding superficial wounds in which the depth of the wound can be determined.
4. Long bone fracture sites are defined as the (1) shaft of the humerus, (2) radius and ulna, (3) femur, (4) tibia and fibula.
5. Vehicle Telemetry Data when available will be relayed to dispatch; the data can assist in predicting potential serious injuries from the data collected at the time of the crash.

B. **Paramedic's Judgment:** If the patient does not meet any of the criteria listed above and the on scene Paramedic (or Paramedic Supervisor) believes the patient may benefit from Trauma Alert criteria due to extenuating circumstances surrounding the incident, the patient may be classified as a "Trauma Alert" and therefore transported according to section IV of this TTP. It shall be documented in the patient care report as required in section 64J-2.013, F.A.C.

Polk County Fire Rescue
Administrative Policies
Trauma Transport

III. Pediatric Trauma Triage Criteria:

Upon arrival at the scene, the crew will initiate Initial Trauma Care and a Primary Survey to assess the patient(s) using the following methodology as outlined in 64J-2.0175 Florida Administrative Code. Those injured individuals with anatomical and physiological characteristics of a person fifteen (15) years of age or younger that meet the following criteria will be classified as a pediatric trauma alert patient and will be transported according to Section IV of this TTP.

A. **Pediatric Trauma Triage Checklist:** The individual is assessed based on each of the physiologic components listed below (left column). The single, most appropriate criterion for each component is selected (along the row to the right). Refer to the color-coding of each criteria and legend on the subsequent page to determine the transport destination:

RED = any one (1) - transport as a trauma alert; BLUE = any two (2) - trauma alert; GREY = Ground transport to trauma center ("Trauma Grey")

	RED	BLUE	GREY
SIZE			WEIGHT ≤ 11 Kg
AIRWAY	ACTIVE AIRWAY ASSISTANCE[1] RESP RATE < 20 IN INFANT < 1 YR RESP RATE < 10 IN CHILDREN 1YR – 15 YR		
CIRCULATION	FAINT or NON-PALPABLE CAROTID or FEMORAL PULSE or SBP < 50 mmHg	CAROTID or FEMORAL PULSES PALPABLE, BUT THE RADIAL OR PEDAL PULSE NOT PALPABLE or SBP < 90-mmHg	
DISABILITY	ALTERED MENTAL STATUS[2] or PRESENCE OF PARALYSIS or SUSPICION OF SPINAL CORD INJURY or LOSS OF SENSATION	AMNESIA or LOSS OF CONSCIOUSNESS	
SOFT TISSUE	MAJOR SOFT TISSUE DISRUPTION[6] or MAJOR FLAP AVULSION 2^{O} or 3^{O} BURNS TO ≥10% TBSA AMPUTATION PROXIMAL TO THE WRIST or ANKLE MAJOR DE-GLOVING INJURY		
LONG BONE FRACTURE/ SKELETAL	DISLOCATION(S), or MULTIPLE FRACTURE SITES[4]	SINGLE LONG BONE[3] FRACTURE SITE[4]	
MECHANISM OF INJURY	ANY PENETRATING INJURY TO HEAD, NECK, or TORSO[7] PENETRATING INJURY TO THE EXTREMITY AT or PROXIMAL TO ELBOW or KNEE	EJECTION (PARTIAL or COMPLETE) FROM AUTOMOBILE DEATH IN SAME PASSENGER COMPARTMENT INTRUSION INCLUDING ROOF >12 INCHES OCCUPANT SITE; >18 INCHES ANY SITE INTO THE PASSENGER COMPARTMENT VEHICLE TELEMETRY DATA CONSISTENT WITH HIGH RISK OF INJURY[5] FALL > 10 FT OR 2-3 TIMES THE HEIGHT OF THE CHILD AUTO VS. PEDESTRIAN/BICYCIST THROWN, RUN OVER or WITH IMPACT GREATER THAN 20 MPH	BLUNT HEAD, CHEST, ABDOMINAL, MUSCULAR SKELETAL TRAUMA IN PATIENT ON ANTICOAGULANTS OR BLEEDING DISORDERS BLUNT ABDOMINAL or CHEST TRAUMA IN PATIENT WITH HISTORY OF PARALYSIS (PARAPLEGIA or QUADRIPLEGIA) EITHER ELECTROCUTION or LIGHTNING WITH LOSS OF CONSCIOUSNESS or VISIBLE SIGNS OF INJURY SEATBELT MARK ON TORSO

1. Airway assistance includes manual jaw thrust, continuous suctioning, or use of other adjuncts to assist ventilatory efforts.
2. Crushed, Major de-gloving injures, mangled extremity or deep flap avulsion (>5 in.)
3. Excluding superficial wounds in which the depth of the wound can be determined.
4. Long bone fracture sites are defined as the (1) shaft of the humerus, (2) radius and ulna, (3) femur, (4) tibia and fibula.
5. Vehicle Telemetry Data when available will be relayed to dispatch; the data can assist in predicting potential serious injuries from the data

B. **Paramedic's Judgment:** If the patient does not meet any of the above listed criteria and the on scene Paramedic or Paramedic Supervisor believes (based on their judgment) the patient may benefit from Pediatric Trauma Alert criteria due to extenuating circumstances surrounding the incident, the patient may be classified as a Pediatric Trauma Alert and therefore transported according to section IV of this TTP. It shall be documented in the patient care record as required in section 64J-2.013, F.A.C.

IV. Transport Destination Procedures

A. All trauma alert patients will be transported to the closest appropriate facility, being either a State Approved Trauma Center (SATC), or an Initial Receiving Hospital (IRH).

B. Initial efforts are to direct transportation of the trauma alert patient to the closest appropriate State Approved Trauma Center.

C. The Paramedic or Paramedic Officer (Lt. BC, MS, etc) that finds any trauma patient that meets the criteria using the appropriate Trauma Scorecard Methodology, as required in sections 64J-2.017 or 2.0175, F.A.C shall immediately notify their Communications Center and issue a Trauma Alert using the words “Trauma Alert”.

D. Refer to AEROMEDICAL TRANSPORT ADMINISTRATIVE POLICY for those patients who may benefit from helicopter transport that aren’t considered a “trauma alert”.

E. The Paramedic will advise the Communications Center of the following information about the trauma alert scene:

1. Total number of patients
2. The total number of trauma alert patients
3. The criteria by which the alert was called
4. The mechanism of injury
5. Any additional resources needed

V. Guidelines for transportation are as follows:

A. **AIR TRANSPORT to a State Approved Trauma Center (SATC):** Transport via Air if helicopter response time is less than 30 minutes.

B. **GROUND TRANSPORT to a State Approved Trauma Center (SATC):** Transport via Ground if drive time is less than 30 minutes.

C. **AIR TRANSPORT to an IRH**

1. The Trauma Transport Protocol of the Air Agency indicates diversion (e.g. Cardiac arrest etc.).
2. MCI situations. *

D. **GROUND TRANSPORT to an IRH nearest the scene of the incident.**

1. With Physician’s Orders from Medical Control when:
   a) Air transport is not available or helicopter response time is greater than 30 minutes and,
   b) Ground transport to SATC is greater than 30 minutes,
2. Cardiac arrest secondary to trauma.
3. Lack of patent airway.
4. MCI situation.

*For situations with multiple trauma patients, not meeting trauma alert criteria, the non-critical patients should be ground transported to initial receiving hospitals nearest the scene of incident. There may be instances in mass casualty situations when the ground units will be overburdened and need air transport to facilitate movement of multiple patients to initial receiving hospitals. If a SATC or an IRH

notifies dispatch that it is temporarily unable to provide adequate care for the trauma patient, resuce personnel, under the direction of Medical Control, will determine the transport method and destination.

VI. Procedures for Emergency Interfacility Transfers

A. Emergency interfacility transfers will be dispatched with the closest available ALS unit, and handled as any other emergency call. The Communication Supervisor will make any unit diversions on a case-by-case basis. Communications will attempt to secure the name of the accepting physician at the receiving facility to relay to the transporting unit. Refer to the Administrative Policy for further information concerning interfacility transports.

VII. List of Hospitals

A. The following is a list of trauma centers and initial receiving hospitals to where Polk County Fire Rescue will routinely transport trauma alert patients. Initial receiving hospitals are indicated by written documentation.

Trauma Centers:

Hospital Name:	Address:	City:	Level:
Bayfront Medical Center	700 Sixth Street South	St. Petersburg	2
Halifax Medical Center	303 North Clyde Morris Blvd.	Daytona Beach	2
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland	2
Orlando Regional Medical Center	1414 South Kuhl Ave.	Orlando	1
Saint Joseph's Hospital	3001 Martin Luther King Blvd.	Tampa	2
Shands at University of Florida	1600 SW Archer Rd.	Gainesville	1
Tampa General Hospital	1 Tampa General Cir	Tampa	1
Ocala Regional Medical Center	1431 SW First Avenue	Ocala	2

A. Initial Receiving Hospitals:

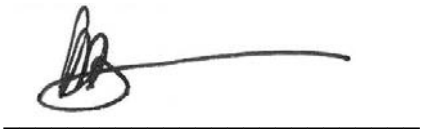
Hospital Name:	Address:	City:
Bartow Regional Medical Center	2200 Osprey Blvd	Bartow
Celebration Health	400 Celebration Pl.	Celebration
Heart of Florida Regional Medical Center	40100 US Highway 27	Davenport
Florida Hospital Heartland	4200 Sun n Lake Blvd	Sebring
Lake Wales Medical Center	410 11th St S	Lake Wales
Poinciana Medical Center	325 Cypress Parkway	Poinciana
South Florida Baptist Hospital	301 N Alexander St	Plant City
Winter Haven Hospital	200 Ave F NE	Winter Haven

Any deviation from these protocols will be documented and justified on the patient care report (PCR).

* In all cases, regardless of the method of transportation or the destination of the Trauma Alert patient, a PCFR run report will be completed for each patient as required in sections 64J-2.013(2) and (3), F.A.C. The patient care report (PCR) will be delivered to the receiving facility and/or EMS agency via "exchanger".

Polk County Fire Rescue
Administrative Policies
Trauma Transport

I, Dr. Pushpal Banerjee hereby approve the PCFR Trauma Transport Protocols as of this date January 1, 2015.



Dr. Pushpal Banerjee

Polk County Fire Rescue
Administrative Policies
Cardiac Transport

I. Dispatch Procedures:

A. Communications Center:

Polk County Fire Rescue Communications Center is located in Polk County. All EMS calls are received and dispatched by this center along with multiple fire departments in Polk County. Enhanced 911 is being utilized and is processed by using a computer aided dispatch system.

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B. List of information to be obtained from caller:

1. Address of the emergency.
2. Telephone number.
3. Illness; Chest pain (non traumatic)
4. Age of patient
5. Is patient conscious and breathing?
6. Is patient completely awake? Is patient breathing normally? Is patient changing color? Is patient clammy? Has the patient ever had a heart attack or angina? Did the patient take any drugs or medications in the past 12 hours?
7. The call taker will utilize the Aspirin Diagnostic & Instruction Tool if the patient has chest pain, is alert and > 16 years old.

C. Method used to identify and dispatch the most readily available unit: The Emergency Medical Services dispatcher will dispatch the closest available unit(s). The closest unit may include a fire department unit, ambulance or other EMS type vehicle. The goal is to deliver a first responder or Paramedic to the scene as quickly as possible to determine care level, stabilization, and treatment.

II. Recognition:

Identification of the ACS patient requires a high index of suspicion. Typical ischemic chest pain qualifies any adult for inclusion in this PROTOCOL. Patients with atypical pain or anginal equivalents should be included, especially if they have a history of coronary artery disease or multiple risk factors. Females, diabetics, and the elderly often present with atypical pain or anginal equivalents and require special attention.

Transmission of 12 Leads:
Crews should transmit 12 Lead EKGs to the hospital when there is a detected abnormality (i.e. elevation, depression, T-wave inversion) or when a physician interpretation is required.

III. Classification:

Acute Coronary Syndromes include Unstable Angina (UA), Non-ST-Elevation MI (NSTEMI), and ST-Elevation MI (STEMI).

A. **Unstable Angina**: Patients who possess normal or non-diagnostic changes in the ST segment or T-wave on a 12 lead EKG. These patients are classified by AHA as intermediate / low-risk unstable angina.

B. **Non-ST Elevation MI (NSTEMI)**: Patients who possess ST segment depression or dynamic T-wave inversion on a 12 lead EKG. These patients are strongly suspicious for ischemia and are classified by AHA as high-risk unstable angina / non-ST-elevation MI.

C. **ST-Elevation MI (STEMI)**: Patients who possess ST segment elevation on a 12 lead EKG. These patients are strongly suspicious for injury and are classified by AHA as ST-Elevation MI.

Polk County Fire Rescue
Administrative Policies
Cardiac Transport

IV. CARDIAC ALERT:

Upon arrival at the scene, the Paramedic will initiate Initial Medical Care and assess the patient using the following methodology as outlined. Those patients that meet the following criteria will be classified as a "CARDIAC ALERT".

A. Patient presents with one or more ACS signs/symptoms including anginal equivalents AND

B. ST elevation of 1.0mm in 2 or more contiguous leads or new (or presumed new) Left Bundle Branch Block (LBBB).

V. Transportation:

A. For patients who are suspected of having an acute MI as evidenced by Paramedic assessment findings, it is important to make contact with the receiving hospital (on-line medical control) as early as possible with transmission of the 12 lead EKG by telemetry (if available). Additional instructions or orders may include, but are not limited to:

1. Specific destination at the receiving facility such as catheterization lab, cardiac holding area, etc.
2. Additional treatments, interventions, or medications.

B. Patients who meet the above CARDIAC ALERT criteria as determined by the on scene Paramedic shall be transported to the nearest PCI center.

1. If the transporting Paramedic deems the patient too unstable for transport to the nearest PCI center, the patient should be transported to the closest receiving facility.
2. Aeromedical transport may be utilized provided the following criteria are met:

A. Ground transport time is greater than 45 minutes to appropriate receiving facility **and**

B. Air support response time is less than 30 minutes.

VI. ICE ALERT:

Upon successful Return of Spontaneous Circulation (ROSC), the Paramedic will initiate an "ICE ALERT". ROSC patients will be transported to the nearest Hypothermia Center listed in the PCFR CLINICAL CARE GUIDELINES. If the nearest Hypothermia Center is unavailable for whatever reason, the Paramedic should transport the patient to the next closest Hypothermia Center.

Polk County Fire Rescue
Administrative Policies
Cardiac Transport

List of Hospitals

The following is a list of initial receiving hospitals, PCI centers, and Hypothermia centers to where Polk County Fire Rescue will routinely transport cardiac alert patients.

Initial Receiving Hospitals:

Hospital Name:	Address:	City:
Bartow Regional Medical Center	2200 Osprey Blvd	Bartow
Celebration Health	400 Celebration Pl.	Celebration
Heart of Florida Regional Medical Center	40100 US Highway 27	Davenport
Florida Hospital Heartland	4200 Sun n Lake Blvd	Sebring
Lake Wales Medical Center	410 11th St S	Lake Wales
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland
Poinciana Medical Center	325 Cypress Parkway	Poinciana
South Florida Baptist Hospital	301 N Alexander St	Plant City
Winter Haven Hospital	200 Ave F NE	Winter Haven

PCI Centers:

Hospital Name:	Address:	City:
Florida Hospital Orlando	601 East Rollins St.	Orlando
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland
Orlando Regional Medical Center	1414 South Kuhl Ave.	Orlando
Osceola Regional Medical Center	700 W. Oak St.	Kissimmee
South Lake Hospital	1900 Don Wickham Dr.	Clermont
Winter Haven Hospital	200 Ave F NE	Winter Haven

Polk County Fire Rescue
Administrative Policies
Cardiac Transport

Hypothermia Centers:

Hospital Name:	Address:	City:
Florida Hospital Orlando	601 East Rollins St.	Orlando
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland
Orlando Regional Medical Center	1414 South Kuhl Ave.	Orlando
Osceola Regional Medical Center	700 W. Oak St.	Kissimmee
South Lake Hospital	1900 Don Wickham Dr.	Clermont
Winter Haven Hospital	200 Ave F NE	Winter Haven

Polk County Fire Rescue
Administrative Policies
Stroke Transport

I. Recognition:

A. All patients that present as a potential acute CVA will be evaluated utilizing the FAST criteria.

1. The FAST criteria includes the Cincinnati Stroke Scale and the Time Last Seen Normal.

B. Patients found to be positive for any of the FAST criteria will be categorized by completing the PCFR Stroke Alert Checklist which includes the Los Angeles Motor Screen (LAMS).

C. Stroke Alert status and destination decision will be based upon the findings of the PCFR Stroke Alert Checklist and LAMS.

1. Non-Stroke Alert: if a patient is excluded by the criterion checklist**, they are not a Stroke Alert** and will be transported to an IRH.

2. Stroke Alert: if a patient meets the Stroke Alert criteria as set forth by the checklist, the on-scene Paramedic will contact the Communications Center, and issue a "Stroke Alert".

- The Paramedic will decide whether the patient requires a Primary Stroke Center or a Comprehensive Stroke Center based on the finding of the PCFR Stroke Alert Checklist.

II. Destination Procedures:

A. The on-scene Paramedic will determine the closest appropriate receiving facility and method of transportation for the destination. This decision will be made according to the guidelines for transportation that follow.

1. The patient and family will be informed of the patient's need for specialized care and the facility to which the patient is being transported.

2. The PCFR Stroke Alert Checklist and LAMS forms **will be completed and given** to the receiving facility or air transport agency.

3. The treating Paramedic will document on the patient care report his / her findings and a justification for transportation to a Stroke Center.

B. When determining appropriate facility, a higher level of care should not be bypassed to transport to a lower level. Comprehensive Stroke Centers can perform Primary Stroke Center care; therefore, if a patient meets the criteria for a Primary Stroke Center and a Comprehensive Stroke Center is closer, the patient will be transported to the comprehensive center.

C. Patients who meet the above STROKE ALERT criteria as determined by the on scene Paramedic shall be transported to the nearest appropriate Stroke Center.

1. If the transporting Paramedic deems the patient too unstable for transport to the nearest Stroke Center, the patient should be transported to the closest receiving facility.

2. All strokes meeting criteria for transport to a Primary Stroke Center should be transported by **GROUND**.

3. All strokes meeting criteria for transport to a Comprehensive Stroke Center will be transported utilizing the following criteria:

a. If time last seen normal is greater than 5 hours but less than 7 hours – **FLY** to Comprehensive Stroke Center.

b. If time last seen normal is less than 5 hours – **GROUND** to Comprehensive Stroke Center.

Polk County Fire Rescue
Administrative Policies
Stroke Transport

The following is a list of Stroke centers and initial receiving hospitals to where Polk County Fire Rescue will routinely transport Stroke Alert patients.

D. Primary Stroke Centers:

Hospital Name:	Address:	City:
Bartow Regional Medical Center	2200 Osprey Blvd	Bartow
Celebration Health	400 Celebration Pl.	Celebration
Heart of Florida Regional Medical Center	40100 US Highway 27	Davenport
Florida Hospital Heartland	4200 Sun n Lake Blvd	Sebring
Lake Wales Medical Center	410 11th St S	Lake Wales
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland
Poinciana Medical Center	325 Cypress Parkway	Poinciana
South Florida Baptist Hospital	301 N Alexander St	Plant City
Winter Haven Hospital	200 Ave F NE	Winter Haven

E. Comprehensive Stroke Centers:

Hospital Name:	Address:	City:
Halifax Medical Center	303 North Clyde Morris Blvd.	Daytona Beach
St. Joseph's Hospital	3001 W. Martin Luther King Blvd	Tampa
Tampa General Hospital	1 Tampa General Cir	Tampa
Shands Gainesville (UF Health)	1600 SW Archer Road	Gainesville
Florida Hospital Orlando	601 E Rollins Street	Orlando
Bayfront Medical Center	701 6th St S	St. Petersburg

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Polk County Fire Rescue
Administrative Policies
Triage System

I. ENROUTE

While you are responding to the scene, you should prepare yourself mentally for what you may find. Perhaps you've been to the same location before. Where might additional resources come from? How long may they take to arrive?

II. INITIAL ASSESSMENT

The first thing is to stay calm and get an overview of the scene. This initial "size-up" will give you an impression of the situation, including the potential number of patients, and possibly the mechanism and severity of their injury. This "size-up" may clue you as to additional resources that may be needed.

III. INITIAL REPORT As you prepare to give the first initial report, use clear and concise information. The key points to communicate are:

A. Location of the incident

B. Type of incident

C. Any hazards

D. Approximate number of victims

E. Type of additional resources needed

IV. SORTING THE PATIENTS

A. It is important not to become involved with the treatment of the first or second patient you initially encounter on scene. Your job is to get to each and every patient as quickly as possible. Each patient should receive a rapid assessment and assigned to broad categories based on their need for treatment.

B. You must not stop during this survey, except to correct airway and severe bleeding problem PCFR quickly. Other rescuers will provide follow-up treatment.

C. Patients are sorted into 4 categories and color classifications:

1. **IMMEDIATE** (Red): Those patients who at risk for early death who need urgent treatment and transport.

2. **DELAYED** (Yellow):

3. **MINOR** (Green): walking wounded identified by verbal instructions

4. **DEAD** (Black):

V. THE S.T.A.R.T. SYSTEM-

This system is based upon 3 observations: R.P.M. defined as RESPIRATIONS, PERFUSION and MENTAL STATUS.

A. **RESPIRATIONS**- If the patient is breathing, you need to determine the respiratory rate. Patients with respiratory rates greater than 30 per minute are triaged as "IMMEDIATE". These patients are showing one of the signs of shock and need immediate care. If the patient is breathing less than 30 times per minute, move on to step # 2. If the patient is not breathing, quickly clear the mouth of foreign matter. Use a head tilt or jaw-thrust (as applicable) to open the airway (You may have to initially ignore cervical spine guidelines when opening the airway in a triage process. This is the only time in emergency care when there may not be time to properly stabilize every injured patient's spine). If the patient begins to breathe, they are categorized as IMMEDIATE. If they don't spontaneously begin to breathe, the patient should be categorized as "DEAD".

B. **PERFUSION**- The best field method for checking circulation and distal perfusion is to check the patient's radial pulse. If the radial pulse is absent, weak or irregular, the patient is categorized as "IMMEDIATE".

C. **MENTAL STATUS**- The last part of the initial triage tests is to assess the patient's mental status. This assessment is done on patients who have adequate breathing and circulation. Test the patient's mental status by having the patient follow a simple command such as "open your eyes", "close your eyes", or "squeeze my hand". Patients who can follow these simple commands are tagged as "DELAYED". A patient who is unresponsive or cannot follow these simple commands is categorized as "IMMEDIATE".

The S.T.A.R.T. system is designed to assist rescuers to find the most seriously injured. The initial triage should take 30 seconds or less. As more rescuers arrive on scene, the remaining patients will be re-triaged for further evaluation, treatment, stabilization, and transportation. A patient may be re-triaged multiple times during the course of the incident.

When resources are limited or the number of injured patients is greater than the number of rescue personnel (patient to Paramedic ratio), the Paramedic must focus treatment and stabilization efforts on the "IMMEDIATE" patient and assign supportive personnel to care for the "DELAYED" patients. In the event of more than one "IMMEDIATE" patient, the initial rescuer must choose the most viable of the "IMMEDIATE" patients to focus their care efforts. Other patients can be cared for by assisting personnel until additional resources arrive. If circumstances permit, the other patients can be moved to a central location by which the Paramedic can monitor care efforts, so long as it doesn't interfere with care of the primary "IMMEDIATE" patient selected.

SECTION TWO

PROTOCOLS

Polk County Fire Rescue
PROTOCOLS
Initial Medical Care

I. GENERAL

A. Assess and secure scene safety.

B. Use universal blood and body substance precautions while treating all patients.

C. Identify and treat immediate life threats per specific PROTOCOLS.

D. Attempt to limit on-scene time to 10 minutes.

E. Apply INITIAL TRAUMA CARE as applicable.

II. INITIAL ASSESSMENT

A. General Impression of the patient's condition including severity of distress.

B. Determine Responsiveness / Level of Consciousness (LOC)[1]

1. A-Alert
2. V- Verbal
3. P- Painful
4. U- Unresponsive

III. The ABCDE

A. CARDIAC ARREST: If patient is found in arrest, initiate CPR, place cardiac monitor's combo/ defibrillation pads on patient and perform a "quick look". Defibrillate as applicable.

B. AIRWAY / C-SPINE: Establish and maintain airway. Utilize cervical spine precautions when indicated. If unable to secure airway by other means and airway is not patent, perform Cricothyrotomy- refer to FOREIGN BODY AIRWAY OBSTRUCTION PROTOCOLS for specifics.

C. Breathing: Check for inadequate breath sounds, JVD, tracheal deviation, and the use of accessory muscles for respirations.

1. Administer the appropriate dosage and route of supplemental O2 as necessary to alleviate the patient's chief complaint, keep O2 sats > 94% and keep the patient's skin condition pink, warm, and dry. All ALS patients will have pulse oximetry monitored and documented.
2. If indicated by ineffective breathing pattern / impaired gas-exchange, assist ventilations, provide an airway and suction as necessary. Following intubation, confirm proper tube placement by auscultating the gastric area and the lungs bilaterally, and noting positive waveform on $EtCo_2$ reading.

D. CIRCULATION: Evaluate peripheral pulses for presence, quality and equality. CPR as indicated. Treat severe external hemorrhage with direct pressure.

1. Establish IV of Normal Saline with macro-drip tubing at KVO or IV Lock system as indicated by patient condition. Micro-drip tubing shall be used for IV infusions for pediatric patients. Attempt X 2 unless situation demands further repeated attempts. Failure to obtain IV access does not preclude the intervention of other definitive therapy.

IMMEDIATE HUMERAL EZ-IO ACCESS FOR ALL CARDIAC ARREST PATIENTS (Asystole/PEA or V-FIB/Pulseless V-TACH)

2. INADEQUATE PERFUSION: Refer to SHOCK PROTOCOLS (2-36).

E. DISABILITY: Assess distal CSM impairment

1. C-Circulation
2. S- Sensory
3. M- Motor

F. EXPOSE: Remove clothing as applicable to assess for hidden illnesses or injuries while protecting the patient's modesty.

Polk County Fire Rescue
PROTOCOLS
Initial Medical Care

IV. ORIENTATION[1]

A. 4/4- Person, Place, Time and Event

B. 3/4- Indicates 1 faculty absent

C. 2/4- Indicates 2 faculties absent

D. 1/4- Indicates 3 faculties absent

E. 0/4- Indicates all faculties absent

[1] An Altered Mental Status (AMS) is defined as an alteration in either the patient's LOC or orientation.

V. FOCUSED AND DETAILED HISTORY AND PHYSICAL EXAM

A. History of present illness or injury

B. Past medical history, drugs, and allergies

C. Systematic head-to-toe assessment

VI. PERFORM INITIAL MEDICAL CARE SIMULTANEOUSLY WITH THERAPIES

A. Place patient in position of comfort if not contraindicated.

B. Paramedic should decide within three (3) minutes after patient contact whether the patient requires ALS.

C. Once a medication route has been established, administer medication as indicated per PROTOCOLS (e.g., IO vs. IV, IM OR IN).

D. Use the cardiac monitor to observe rhythm. Confirm assessment in another lead if necessary to correctly identify rhythm. Record strips every 5 minutes (unstable) to 15 minutes (stable), and to document intervention necessities and outcome. Perform a 12 lead EKG on all patients with suspected cardiac or respiratory problems including associated complaints of syncope, near syncope or general weakness.

E. Assess vital signs and patient condition every 5 minutes (unstable) to 15 minutes (stable) and before and after medication administration.

If there is no response to the appropriate treatment, consider contacting Medical Control.

Polk County Fire Rescue
PROTOCOLS
Initial Trauma Care

I. GENERAL

A. Assess and secure scene safety.

B. Use universal blood and body substance precautions while treating all patients.

C. Assess for potential injuries based on mechanism of energy transfer.

D. Refer to TRIAGE SYSTEM ADMINISTRATIVE POLICY for multiple patients and injuries.

E. Identify and treat immediate life threats per specific PROTOCOL.

F. Initiate Trauma Alert if applicable.

G. Attempt to limit on-scene time to 10 minutes.

H. Apply INITIAL MEDICAL CARE as applicable.

II. INITIAL ASSESSMENT

A. General Impression of the patient's condition including severity of distress.

B. Determine Responsiveness / Level of Consciousness (LOC)[1]

1. A- Alert
2. V- Verbal
3. P- Painful
4. U- Unresponsive

C. The ABCDE

1. CARDIAC ARREST: If patient is found in arrest initiate CPR and place cardiac monitor's paddles or combo/ defibrillation pads on patient and perform a "quick look". Defibrillate as applicable.
2. AIRWAY / C-SPINE: Manual C-spine immobilization may be indicated in patients with significant injury above clavicles, head injury resulting in AMS, or mechanism of injury that suggests sudden or violent movement of the spine. Position airway and suction as needed. If intubation required, utilize in-line or neutral technique unless contraindicated. If unable to secure airway by other means and airway not patent, perform Cricothyrotomy.
3. BREATHING: Check for inadequate breath sounds, JVD, tracheal deviation, and the use of accessory muscles for respirations. Assess for tension pneumothorax and treat as per PLEURAL DECOMPRESSION PROCEDURE.
    a. Administer the appropriate dosage and route of supplemental O2 as necessary to alleviate the patient's chief complaint, keep O2 sats > 94% and keep the patient's skin condition pink, warm and dry. All ALS patients will have pulse oximetry monitored and documented.
    b. If indicated by ineffective breathing pattern / impaired gas-exchange, assist ventilations, intubate or provide an airway and suction as necessary. Following intubation, confirm proper tube placement by auscultating the gastric area and the lungs bilaterally, and noting positive waveform $EtCo_2$ reading.

Polk County Fire Rescue
PROTOCOLS
Initial Trauma Care

4. CIRCULATION: Evaluate peripheral pulses for presence, quality, and equality. CPR as indicated. Treat severe external hemorrhage with direct pressure.
    a. ADEQUATE PERFUSION: Establish IV of normal saline large bore @ KVO with macro-drip tubing at KVO. Micro-drip tubing shall be used for IV infusions for pediatric patients. If assessment indicates possible deterioration, refer to SHOCK PROTOCOL. Attempt X 2 unless situation demands further repeated attempts. Failure to obtain IV access does not preclude the intervention of other definitive therapy.
    b. INADEQUATE PERFUSION: Refer to SHOCK PROTOCOL and initiate enroute unless delayed by extrication.
5. DISABILITY: Assess distal CSM impairment
    a. C-Circulation
    b. S- Sensory
    c. M- Motor
6. EXPOSE: Remove clothing as applicable to assess for hidden injuries while protecting the patient's modesty.

III. ORIENTATION[1]

A. 4/4- Person, Place, Time, and Event

B. 3/4- Indicates 1 faculty absent

C. 2/4- Indicates 2 faculties absent

D. 1/4- Indicates 3 faculties absent

E. 0/4- Indicates all faculties absent

[1] An Altered Mental Status (AMS) is defined as an alteration in either the patient's LOC or orientation.

IV. FOCUSED AND DETAILED HISTORY AND PHYSICAL EXAM

A. History of present illness or injury

B. Past medical history, drugs, allergies

C. Systematic head-to-toe assessment

V. PERFORM INITIAL TRAUMA CARE SIMULTANEOUSLY WITH THERAPIES

A. Place patient in position of comfort unless contraindicated.

B. Paramedic should decide within three (3) minutes after patient contact whether the patient requires ALS.

C. Once a medication route has been established, administer medication as indicated per PROTOCOL (e.g., IO vs. IV).

D. Use cardiac monitor to observe rhythm. Confirm assessment in another lead if necessary to correctly identify rhythm. Record strips every 5 minutes (unstable) to 15 minutes (stable), and to document intervention necessities and outcome.

E. Assess vital signs and patient condition every 5 minutes (unstable) to 15 minutes (stable) and before and after medication administration.

If there is no response to the appropriate treatment, consider contacting Medical Control.

Acute Coronary Syndrome

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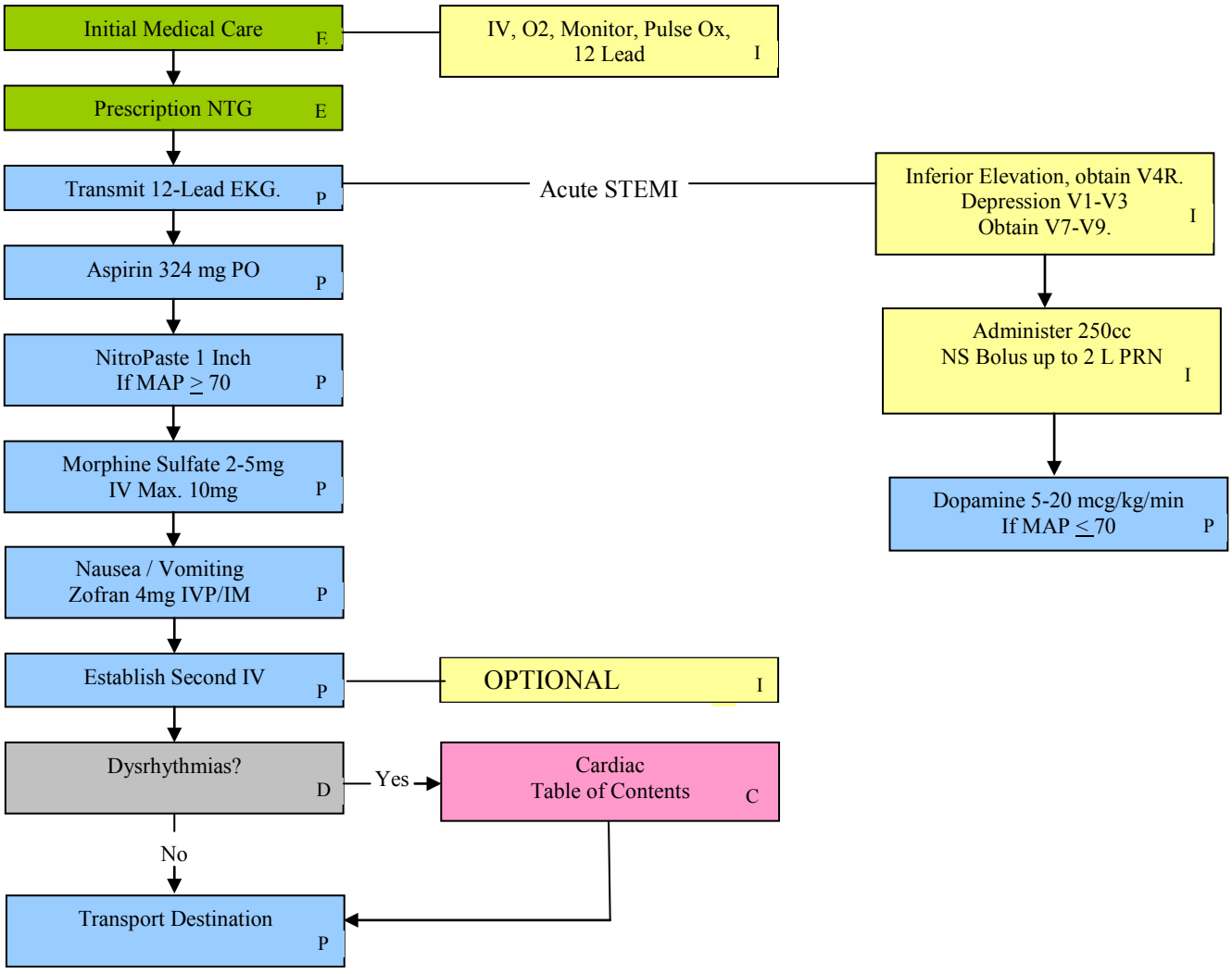
Acute Coronary Syndrome – Pearls

- If ST elevation in inferior leads (II, III, aVF) obtain V4R. If ST depression in early V leads (V1-V3) obtain V7-V9. Triage EKG into one of the three following categories.
    - **Non-diagnostic – No ST abnormalities.**
    - **Suspicious for Ischemia – ST depression (without elevation). If patient has ST depression in 2 or more contiguous leads**
    - **Suspicious for injury – ST elevation. If patient has ST elevation in 2 or more contiguous leads**
- Withhold **ASA** if patient self administered 324 mg or more ASA in last 8 hours.
- EMTs may assist with the patient's ASA.
- Do not administer **NTG-Paste** if the patient has taken: Viagra, Levitra, or Cialis within the last 24 hours. Remember that although not typically prescribed to women they may have handled the medication, use caution.
- NitroPaste: 1 inch = 14mg
- **NTG: Use caution in patients with possible Right Ventricular Infarct**
- Relieve pain and discomfort with **MORPHINE SULFATE**. Allow 5 minutes between doses and reassess vital signs and discomfort level.
- **ZOFRAN** may be given IM (undiluted) in absence of an IV.
- **Currently the AHA recognizes 1 mm of elevation in 2 contiguous leads as a STEMI. Depression of ½ mm is significant for ischemia.**
- **According to the 2010 AHA Guidelines you should consider a STEMI for ST Elevation in V2 & V3 for the following patients:**
    - **Women with 1.5 mm of elevation**
    - **Men ≥ 40 with 2 mm of elevation**
    - **Men < 40 with 2.5 mm of elevation**

Acute Coronary Syndrome

History:	Signs and Symptoms	Differential:
• Age • Medications • Viagra, Levitra, Cialis • Past Medical history • Allergies • Recent physical exertion • Onset • Palliation / Provocation • Quality (crampy, constant, sharp, dull, etc.) • Region / Radiation / Referred • Severity (0-10) • Time (duration, repetition)	• Chest Pain (pressure, aching, vice-like tightness, discomfort) • Location (substernal, epigastric, arm, jaw, neck, shoulder) • Radiation of pain • Pale, diaphoresis • Shortness of breath • Nausea, vomiting • Weakness • Syncope/Near Syncope • Dizziness	• Trauma vs. Medical • Angina vs. Myocardial Infarction • Pericarditis • Pulmonary embolism • Asthma / COPD • Pneumothorax • Aortic dissection or aneurysm • GE reflux or Hiatal hernia • Esophageal spasm • Chest wall injury or pain • Pleural pain • Overdose (Cocaine) • Anginal equivalents



Asystole / PEA

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Asystole/PEA – Pearls

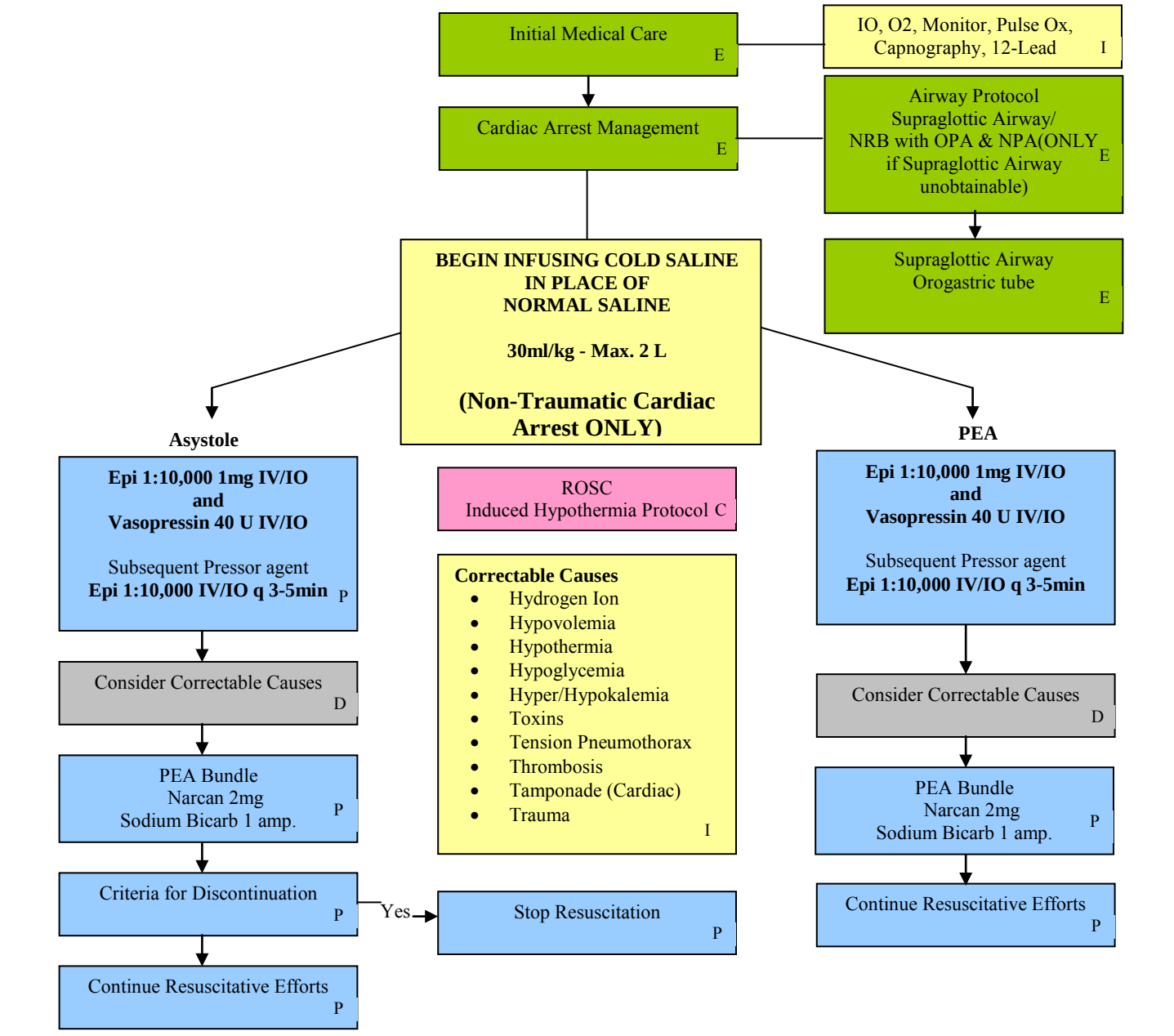
- If using an AED, follow the manufacture's prompts for cardiac arrest management
- Treatment sequence: Prepare next drug prior to rhythm check. Administer drug during CPR, as soon as possible after the rhythm check confirms no VF/Pulseless VTach. Continue good quality compressions while drugs are prepared and administered. Ideally, chest compressions should be interrupted only for ventilation (until advanced airway placed) and rhythm check. Search for and treat possible contributing factors.
- **VASOPRESSIN**: 40 U IV/IO and **EPINEPHRINE**: 1mg 1:10,000 IV/IO **to be given sequentially in first administration ONLY!**
- **Subsequent Pressor administrations will be Epinephrine**: 1mg 1:10,000 IV/IO **ONLY!**
- **EPINEPHRINE 1:1,000**: Mix 1mg in 9cc NS IVP can be used as an alternative to Epinephrine 1:10,000.
- IV drugs should be followed with an immediate 20ml bolus of NS and raising the arm for 15-20 seconds.
- PEA Bundle consists of BGL check, fluid, Narcan, and Sodium Bicarb to treat reversible causes.
- iGEL Supraglottic Airway: Reconfirm placement after repositioning or moving patient. Administer 6 breaths per minute avoiding hyperventilation.
- **ET TUBES WILL NO LONGER BE UTILIZED IN CARDIAC ARREST PATIENTS**
- iGEL Supraglottic Airway is a higher priority in a PEA/ Asystole cardiac arrest.
- Airway management will be comprised of NRBM with oral or nasal adjunct when a Supraglottic Airway cannot be successfully obtained.
- Priority should be given to good quality compressions with minimal interruptions.
- Orogastric tubes shall be utilized in cardiac arrest patients to assist in the decompression of the abdomen
- Post resuscitation: Use **VERSED** with caution in the presence of hypotension (SBP < 100mmHg).

Cardiac Arrest Management:

- Application of Lucas 2 (optional).
- Assess patient using primary ABCD Survey and perform appropriate action following 2010 American Heart Association CPR Guideline.
- Follow END OF LIFE POLICY as necessary.
- If arrest ≥ 4 minutes, perform 2 minutes of CPR prior to accessing the rhythm.
- If arrest ≤ 4 minutes or witnessed, assess rhythm
- Reassess rhythm after every 2 minute period of CPR, assess carotid pulse if organized rhythm, do not exceed 10 seconds. If no pulse or unsure, resume CPR.
- **ATROPINE IS NO LONGER TO BE UTILIZED IN CARDIAC ARREST PATIENTS**

Asystole/PEA

History:	Signs and Symptoms	Differential:
• Past medical history • Medications • Events leading to arrest • End stage renal disease • Estimated downtime • Suspected hypothermia • Suspected overdose • DNR	• Pulseless • Apneic • No auscultated heart tones	• Medical or Trauma • Hypoxia • Potassium (hypo / hyper) • Drug overdose • Acidosis • Hypothermia • Device (lead) error • Death



Bradycardia

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Bradycardia – Pearls

- Milli-amps should be rapidly increased to an initial target of 85mA.
- **TCP** should be administered when HR < 50bpm and patient unstable
- **ATROPINE** should be administered when HR < 50bpm and patient stable
    - Use shorter dosing intervals (3 minutes) and higher doses of **ATROPINE** in severe clinical conditions, especially with Organophosphate Poisoning where 2 to 4 mg doses may be required.
- DO NOT administer **ATROPINE** to patients in 2nd degree type II or 3rd degree AV blocks. **ATROPINE** administration should not delay implementation of TCP for patients with inadequate perfusion. AVOID **ATROPINE** in the presence of **Acute Coronary Ischemia** or **Myocardial Infarction**.
- **DOPAMINE:** Increase in 5 mcg/kg/min increments q 5minutes until you reach a MAP of 70 or greater. Max dose 20mcg/kg/min

  (2 x Diastolic) + Systolic / 3 = MAP (MAP can also be found next to the BP on the MRX monitor)

Dopamine drip: 400mg in 250ml D5W: 1600mcg/ml solution.

Weight (kg)	5mcg/kg/min	10mcg/kg/min	15mcg/kg/min	20mcg/kg/min
40	8	15	23	30
50	9	19	28	38
60	11	23	34	45
70	13	26	39	53
80	15	30	45	60
90	17	34	51	68
100	19	38	56	75
110	21	41	62	83
120	23	45	68	90

IF MAX DOSE OF DOPAMINE REACHED AND MAP STILL <70mmHg

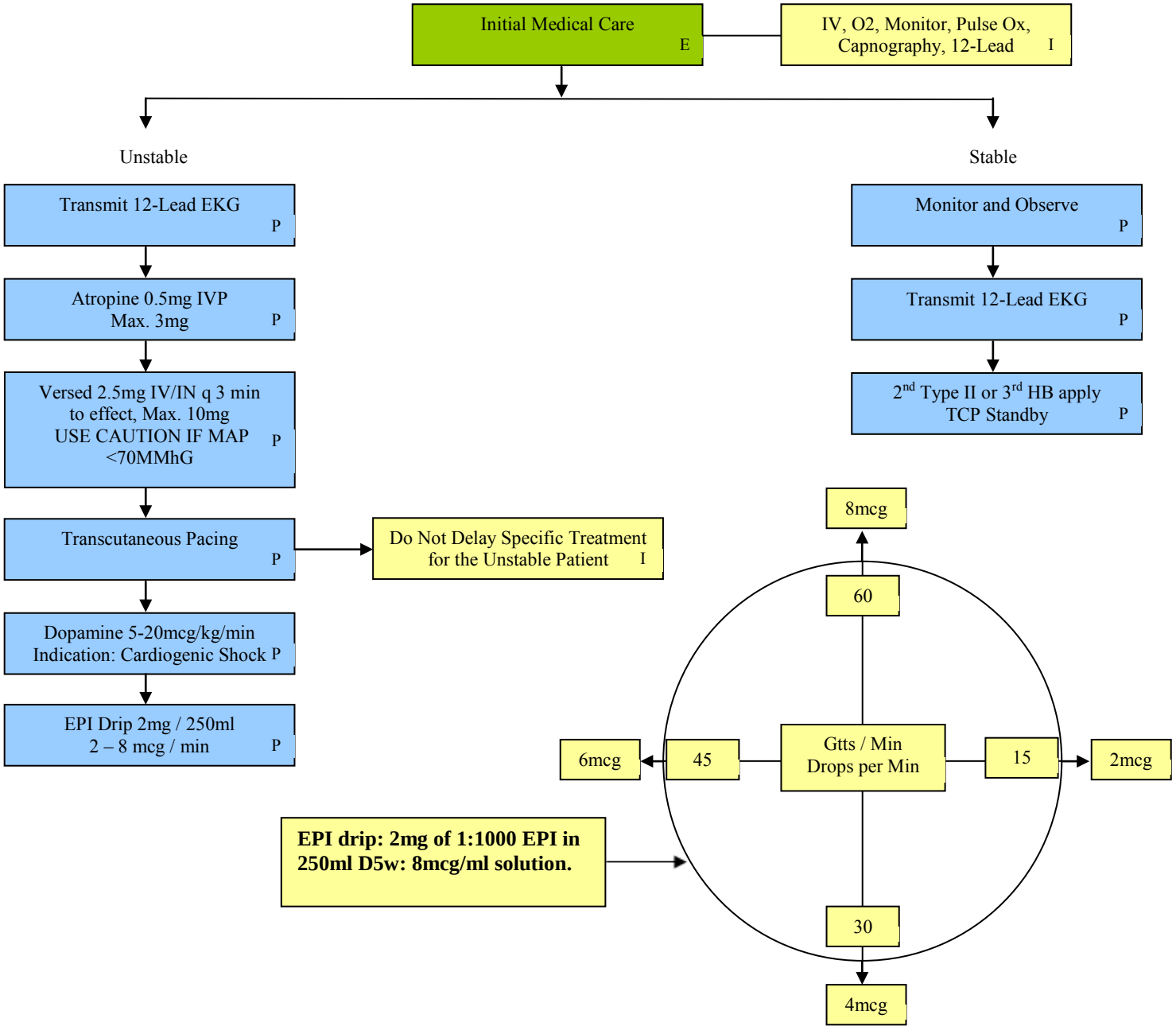
- **EPI Drip**: Initial dose 2mcg/min; increase by increments of 2mcg Q5 minutes to max dose of 8mcg/min.

EPI drip: 2mg of 1:1000 EPI in 250ml D5w: 8mcg/ml solution.

15 drips per min	1 drip per 4 seconds	2 mcg
30 drips per min	1 drip per 2 seconds	4 mcg
45 drips per min	3 drips per 4 seconds	6 mcg
60 drips per min	1 drip per second	8 mcg

Bradycardia

History:	Signs and Symptoms	Differential:
• Medical history • Medications • Beta blockers (Toprol, Atenolol) • Calcium channel blockers (Verapamil, Calan) • Clonidine • Digitalis • Pacemaker	• Heart rate < 50 • Chest pain • Respiratory distress • Hypotensive or shock • Altered mental status • Syncope	• Acute MI • Hypoxia • Hypothermia • Sinus Bradycardia • Athletes • Head injury (elevated ICP or stroke) • Spinal cord lesion • Sick sinus syndrome • AV blocks (1°, 2°, or 3°) • Overdose



Induced Hypothermia

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Induced Hypothermia – Pearls

- **BEGIN COOLING PATIENTS WITH COLD SALINE IMMEDIATELY!**

- **Criteria for Induced Hypothermia:**
  - Age greater than 18
  - Patient has an advanced airway in place and remains comatose (no purposeful response to pain)
  - Non-Traumatic Cardiac Arrest
- **Exclusion Criteria for Induce Hypothermia:**
  - Trauma Cardiac Arrest
  - Awake and responsive to verbal commands after cardiac arrest (D/C cold fluids)
- If patient meets criteria for induced hypothermia and does not have an advanced airway in place, then place either an ET Tube or Supraglottic Airway according to protocol.
- When exposing patient for purpose of cooling undergarments may remain in place. Be mindful of your environment and take steps to preserve the patient's modesty.
- Do not delay transport for the purpose of cooling.
- Reassess airway frequently and with every patient move.
- Patients develop metabolic alkalosis with cooling. Do not hyperventilate.
- GOAL is to drop body temperature 1 degree C.
- **DOPAMINE:** Increase in 5 mcg/kg/min increments q 5minutes until you reach a MAP of 70 or greater.

  (2 x Diastolic) + Systolic = MAP (MAP can also be found next to the BP on the MRX monitor)

  3

  DOPAMINE MAXIMUM 20 mcg/kg/min.

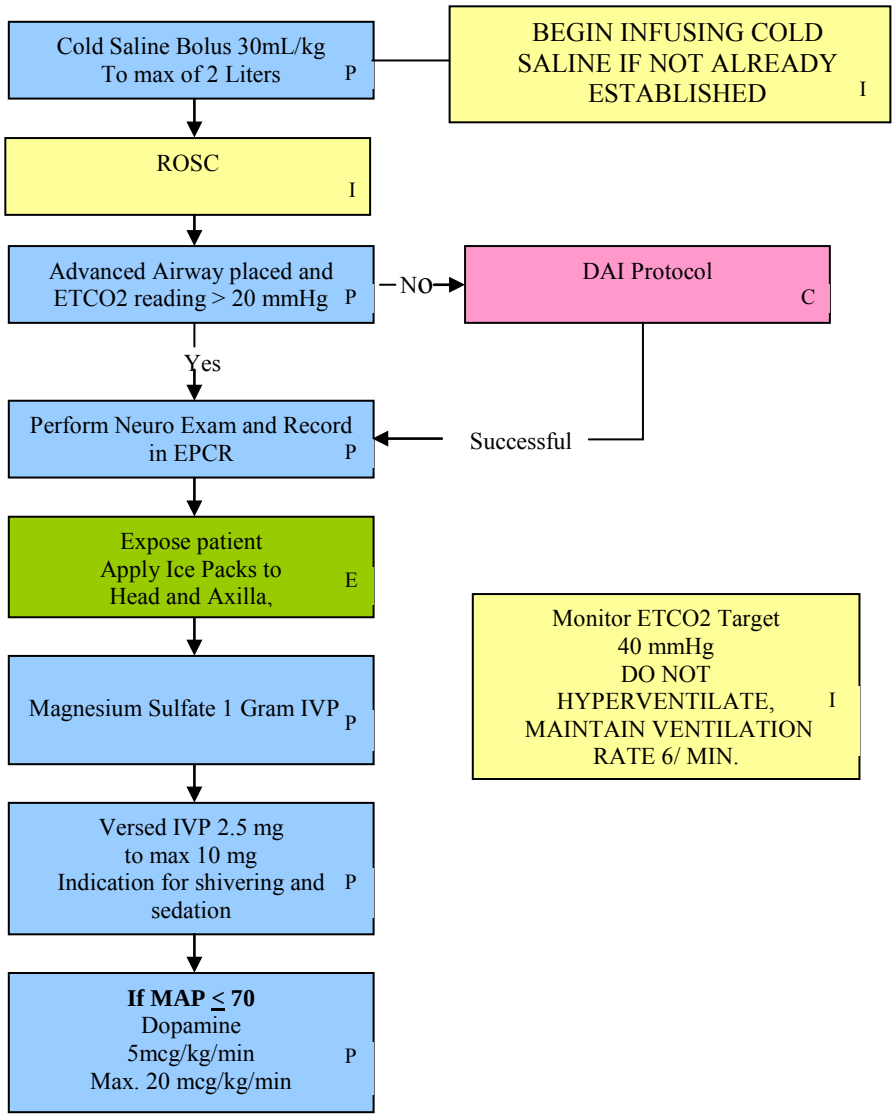
Hospitals That Are Continuing Induced Hypothermia

Hospital Name:	Address:	City:
Florida Hospital Orlando	601 East Rollins St.	Orlando
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland
Orlando Regional Medical Center	1414 South Kuhl Ave.	Orlando
Osceola Regional Medical Center	700 W. Oak St.	Kissimmee
South Lake Hospital	1900 Don Wickham Dr.	Clermont
Winter Haven Hospital	200 Ave F NE	Winter Haven

Induced Hypothermia

History:	Signs and Symptoms	Differential:
• Non-Traumatic Cardiac Arrest	• Return of Pulse	• Continue to address specific differentials associated with the original dysrhythmia

Celsius	Fahrenheit
42	107.6
41	105.8
40	104
39	102.2
38	100.4
37	98.6
36	96.8
35	95
34	93.2
33	91.4
32	89.6
31	87.8
30	86
29	84.2
28	82.4



Narrow Complex Tachycardia

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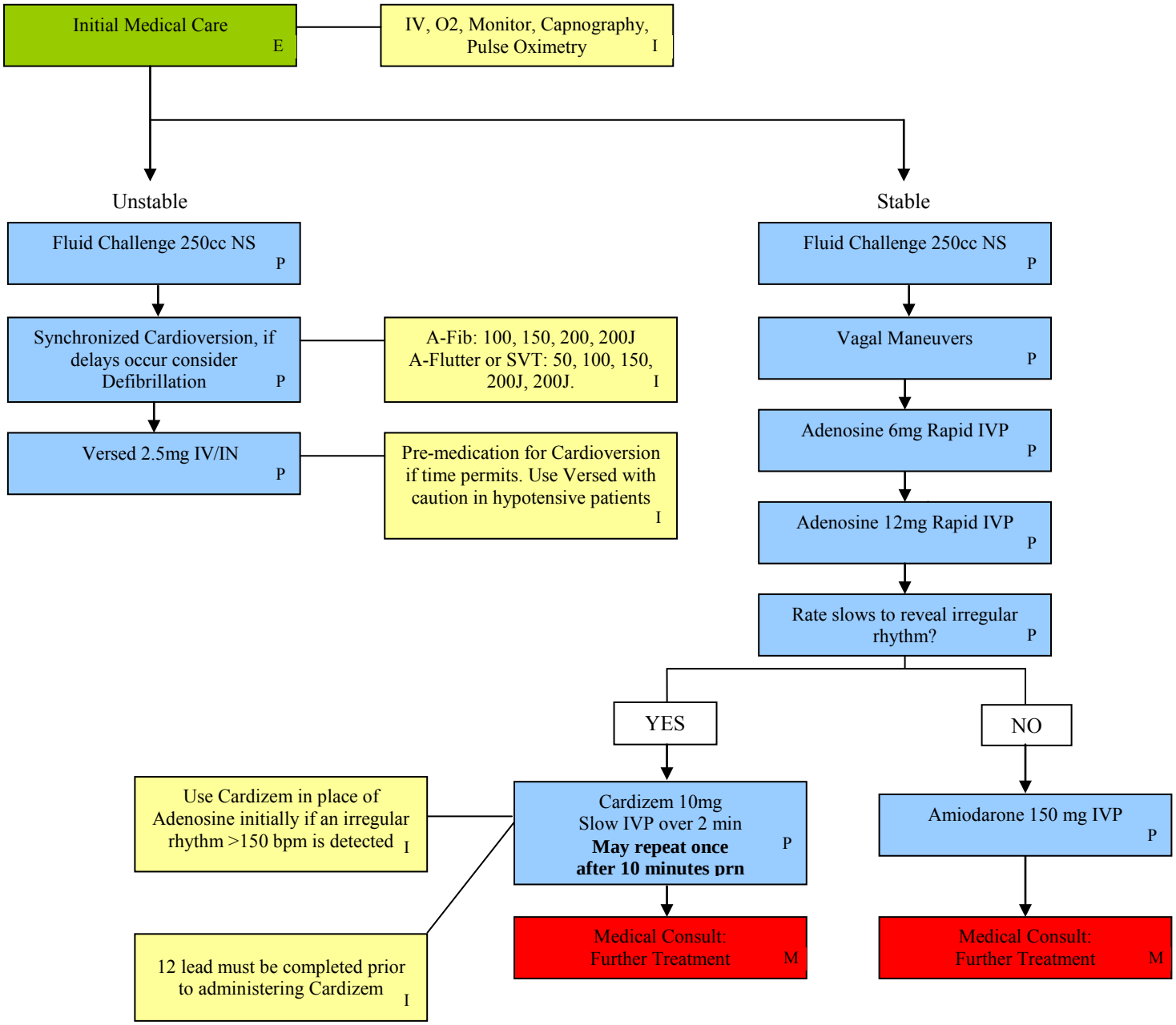
Narrow Complex Tachycardia – Pearls

- If rhythm does not convert with one or more doses of **ADENOSINE,** reconfirm rhythm and consider alternate treatment.
- **NOTE:** ONLY administer two doses of **ADENOSINE (6mg followed by only <u>one</u> dose of 12mg)**
- **ADENOSINE** administration or **VAGAL** attempts.
    - **EXAMPLE: SVT rhythm slows momentarily with ADENOSINE administration then speeds up again. CARDIZEM may be used in this situation as long as MAP ≥ 70.**
    - **DO NOT USE CARDIZEM** if rate and/or rhythm does not change with VAGAL attempts, ADENOSINE or if DELTA WAVES are noted. This may indicate accessory pathway issues (i.e. Wolfe Parkinson White).
- **CARDIZEM** should be administered when there is a recognized change in the rhythm (to irregular i.e. A-FIB)
- **CARDIZEM** should be the primary drug administered when an irregular rhythm is detected (A-Fib RVR >150)
- **CARDIZEM** is contraindicated when MAP ≤ 70
- **CARDIZEM slow IVP over 2 minutes**
- Consider pre-medication with **VERSED**: 2.5mg IV/IN, repeat every 3 – 5 minutes until adequate relaxation/ sedation is achieved prior to cardioversion (max total dosage 10mg). Use **VERSED** with caution in the presence of **hypotension MAP <u>≤ 70</u>**
- If rhythm does not convert, escalate energy level for subsequent SYNCHRONIZED CARDIOVERSION:
    - Atrial Fibrillation: Start at 100J, 150J, 200J, 200J.
    - SVT & Atrial Flutter: Start at 50J, 100J, 150J, 200J, 200J.
- If delays in synchronization occur and clinical condition is critical, proceed immediately to unsynchronized shocks, i.e. defibrillation.

Narrow Complex Tachycardias

History:	Signs and Symptoms	Differential:

• Medications (Aminophylline, Diet pills, Thyroid, decongestants, Digoxin)
• Diet (Caffeine, Chocolate)
• Drugs (Nicotine, Cocaine)
• Medical History
• History of Palpitations / heart racing
• Syncope / Near Syncope
	• HR > 150
	• QRS < 0.12 sec
	• Dizziness, C/P, Dyspnea
	• Potential presenting rhythm
	  • Sinus Tachycardia
	  • Atrial Fib / Flutter
	  • Multifocal Atrial Tachycardia
		• Heart disease (WPW, Valvular)
		• Sick Sinus Syndrome
		• Myocardial Infarction
		• Electrolyte Imbalance
		• Exertion, Pain, Stress
		• Fever
		• Hypoxia
		• Hypovolemia or Anemia
		• Drug effect
		• Hyperthyroidism
		• Pulmonary Embolus



V-Fib – Pulseless V-Tach

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V-Fib / Pulseless V-Tach – Pearls

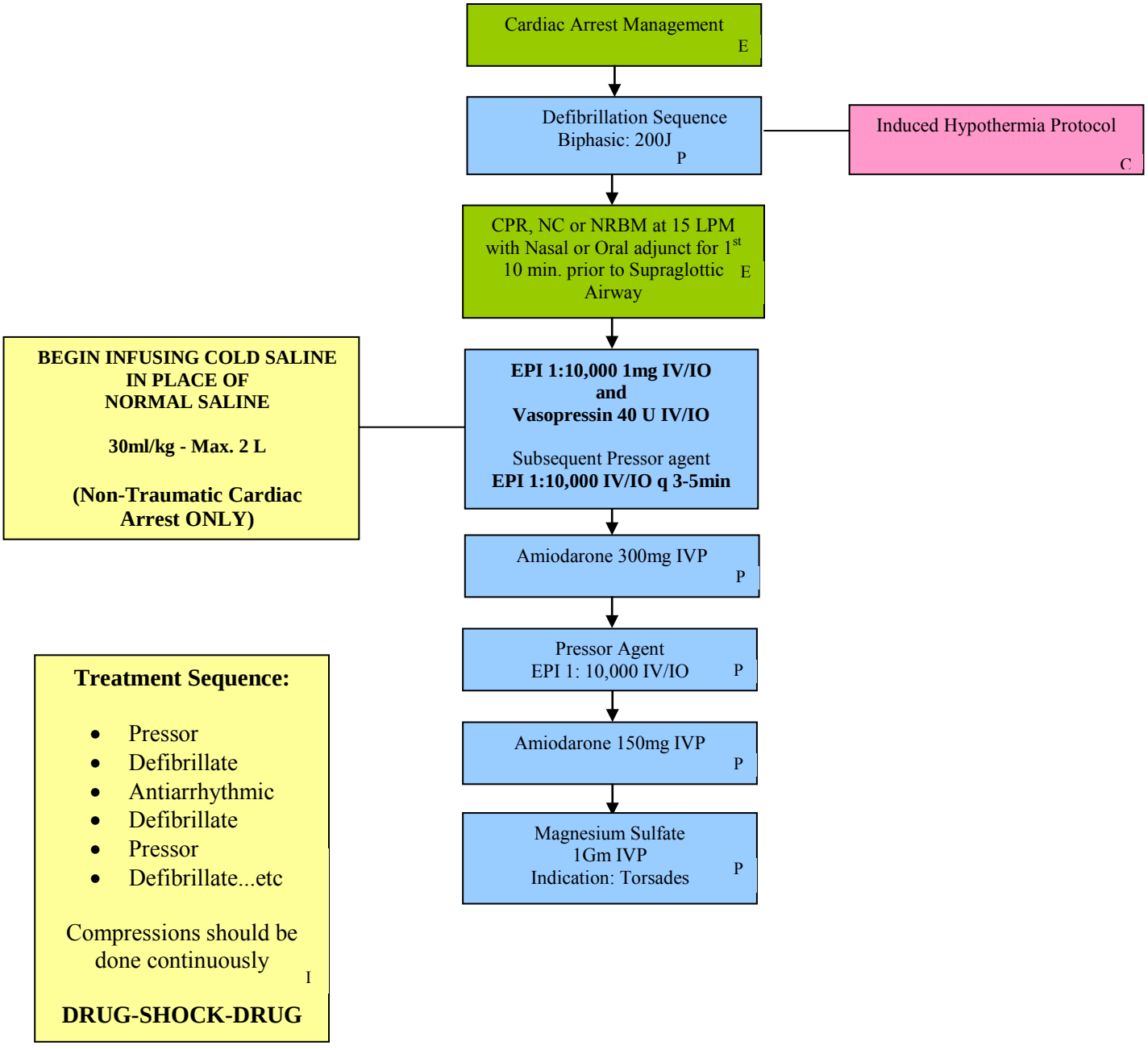
- **ET TUBES WILL NO LONGER BE UTILIZED IN CARDIAC ARREST PATIENTS**
- If using an AED, follow the manufacturer's prompts for cardiac arrest management
- Treatment sequence: Prepare next drug prior to rhythm check. Administer drug during CPR, as soon as possible after the rhythm check confirms VF/Pulseless V-Tach. Do not delay shock. Continue good quality compressions while drugs are prepared and administered. Ideally, chest compressions should be interrupted only for ventilation (until advanced airway placed) and rhythm check and actual shock delivery.
- **Continuous, high quality chest compressions.**
  - Nasal Cannula OR Non Rebreather Mask (NRBM) at 15 lpm with Nasal or Oral adjuncts for first 10 min of CPR
  - 5 (2 min cycles) with 5 second pauses for pulse and rhythm checks between each cycle.
  - At end of 5 (2min. cycles) or 10 min. place a Supraglottic Airway.
    - Administer 1 breath every 10 seconds via BVM; avoiding hyperventilation.
    - Reconfirm placement of Supraglottic Airway after repositioning or moving patient.
- Orogastric tubes shall be utilized in cardiac arrest patients to assist in the decompression of the abdomen
- IV drugs should be followed with an immediate 10ml bolus of NS and raising the arm for 15-20 seconds.
- **VASOPRESSIN**: 40 U IV/IO and **EPINEPHRINE**: 1mg 1:10,000 IV/IO **to be given Back to Back in first dose ONLY!**
- **Subsequent Pressor administrations will be Epinephrine**: 1mg 1:10,000 IV/IO **ONLY!**
- **AMIODARONE:** If a bolus of Amiodarone has been given (i.e. 300mg or 150mg in a code) a maintenance drip should not be administered. Use a drip when conversion occurs without an initial bolus.
- **AMIODARONE Drip** (150mg/10 minutes):
  - Mix 150mg in 50ml NS = 300ml/hr via IV pump or 50gtts/min via 10gtt IV set (if pump unavailable).
- **MAGNESIUM SULFATE**
  - Mix 1gm in 10ml NS IVP. Administer over 5 minutes. May repeat once for total of 2gm.
- Post resuscitation: Use **VERSED** with caution in the presence of hypotension MAP $\leq$ 70

Cardiac Arrest Management:

- Consider Application of Lucas 2 Chest Compression System if available.
- Assess patient using primary ABCD Survey and perform appropriate action following 2010 AHA CPR Guideline.
- Follow END OF LIFE POLICY as necessary.
- If arrest $\geq$ 4 minutes or unwitnessed by crew, perform 2 minutes of High Quality CPR with NC or NRBM prior to assessing the rhythm. Defibrilate 200J if shockable rhythm and place Supraglottic airway then initiate Humeral IO, medication therapy and continue efforts.
- If arrest $\leq$ 4 minutes or witnessed by crew, assess rhythm and defibrilate 200J if needed. Perform 10 minutes of High Quality CPR with NC or NRBM and initiate Humeral IO with medication therapy. At the end of 10 minutes place Supraglottic airway and continue efforts.
- Reassess rhythm after every 2 minute period of CPR, assess radial pulse if organized rhythm, do not exceed 10 seconds. If no radial pulse or unsure, resume CPR.
- **DOUBLE SEQUENTIAL DEFIBRILLATION:** utilized for patients in refractory V-fib or V-tach after 3 defibrillation combination MRX or AEDs. Combo pads will be placed anterior/posterior as well as the normal right and left placements.
  - **Any combination of MRX or AED can be used for this procedure**

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

History:	Signs and Symptoms	Differential:
• Estimated down time • Past medical history • Medications • Events leading to arrest • Renal failure / dialysis • DNR	• Unresponsive, apneic, pulseless • Ventricular fibrillation or ventricular tachycardia on ECG	• Asystole • Artifact / Device failure • Cardiac • Endocrine / Metabolic • Drugs • Pulmonary



Wide Complex Tachycardia

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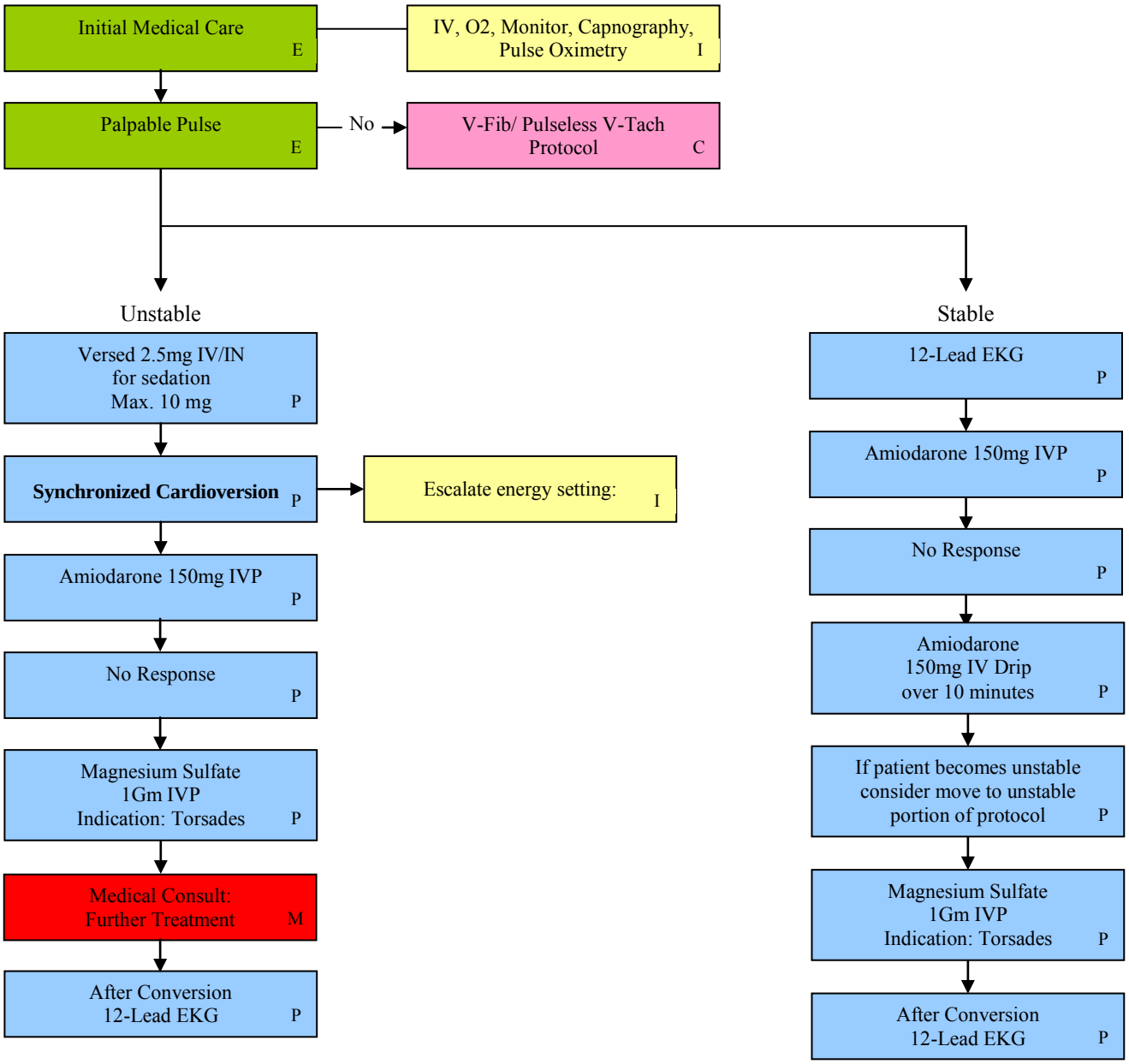
Wide Complex Tachycardia – Pearls

- For witnessed/monitored ventricular tachycardia, try having patient cough.
- Only treat sustained wide complex tachycardia with Amiodarone/Cardioversion. Sustained wide complex tachycardia is considered to be runs of 6 or more wide complexes. Patients with shorter runs or extensive ectopy should receive high flow O2 and be monitored closely.
- **AMIODARONE:** If a bolus of Amiodarone has been given (ie 300mg or 150mg in a code) a maintenance drip should not be administered. Use a drip when conversion occurs without an initial bolus.
- **AMIODARONE:** A stable patient in a Wide Complex Tach rhythm should receive IVP of 150mg. If No response administered 150mg IV drip over 10min.
- **AMIODARONE Drip** (150mg/10 minutes):
    - Mix 150mg in 50ml NS = 300ml/hr via IV pump or 50gtts/min via 10gtt IV set (if pump unavailable).
- **AICD**: **Amiodarone drip** may be administered provided that 6 or more wide complexes were witnessed and the patient converts. If an AICD fires and complexes were not witnessed **DO NOT** administer Amiodarone Drip.
- Consider pre-medication with **VERSED**: 2.5mg IV/IN, repeat every 3 – 5 minutes until adequate relaxation/ sedation is achieved prior to cardioversion (max total dosage 10mg). Use VERSED with caution in the presence of hypotension (SBP < 100mmHg).
- If rhythm does not convert, escalate energy level for subsequent SYNCHRONIZED CARDIOVERSION:
    - Wide Complex: Start at 100J, 150J, 150J, 150J.
    - Atrial Fibrillation: Start at 100J, 150J, 200J, 200J.
- If delays in synchronization occur and clinical condition is critical, proceed immediately to unsynchronized shocks, i.e. defibrillation.
- **MAGNESIUM SULFATE.**
    - Mix 1gm in 10ml NS Slow IVP. Administer over 5 minutes. May repeat once for total of 2gm

Wide Complex Tachycardia

History:	Signs and Symptoms	Differential:
• Past medical history • Medications, diet, drugs • Syncope / near syncope • Palpitations • Pacemaker • Allergies: Lidocaine / Novocain	• Ventricular tachycardia on ECG (Runs or sustained) • Conscious, rapid pulse • Chest pain, shortness of breath • Dizziness • Rate usually 150 - 180 bpm for sustained V-Tach • QRS > .12 Sec	• Artifact / Device failure • Cardiac • Endocrine / Metabolic • Hyperkalemia • Drugs • Pulmonary



Ventricular Assist Device

(VAD)

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Ventricular Assist Device – Pearls

- **IF A PATIENT IS EXPERIENCING ISSUES WITH THEIR VAD, BEGIN BY ATTEMPTING TO CONTACT THE HOSPITAL WHERE THE VAD WAS INSTALLED.**
    - Most patients will have this contact information attached to the VAD itself or in the VAD carrying case.
    - Ask family members about the contact information and call for instructions for the VAD Coordinator.
    - Some VADs are equipped with a manual pump, follow VAD Coordinator instructions.
- There may not be a measurable blood pressure because the VAD is a continuous flow pump.
- The patient may be pulseless while the device is functioning.
- In some cases, if the patient's heart still has some function, you may feel thready pulse.
- The Pump is connected to an electric line exiting the patient's abdominal area which is attached to a computer that runs the pump.
- The Pump should not affect the EKG reading.
- All ACLS drugs may be administered.
- Patients can be defibrillated while connected to the device and nothing needs to be disconnected in order to defibrillate.
- Battery life is generally about 10 to 14 hours (bring extra batteries for transport)
- Any emergency mode of transport is acceptable.
- These patients are permitted to fly if need and the VAD hospital recommends that mode of transport
- Be sure to bring ALL of the patient's VAD equipment with them and follow the VAD Coordinators instruction if contact is made.
- Approved VAD Hospitals are Hospitals that can implant and maintain the VAD

Approved VAD Hospitals		
Florida Hospital Orlando	601 East Rollins St.	Orlando
Shands at University Of Florida	1600 SW Archer Rd.	Gainesville
Tampa General Hospital	1 Tampa General Cir	Tampa

- "Shared Care Center" and not an implanting center. They do not have a VAD certified cardiac surgeon however they have a VAD trained heart failure Cardiology team.

Approved Shared Care Centers		
Orlando Regional Medical Center	1414 South Kuhl Ave.	Orlando

Ventricular Assist Device

History:	Signs and Symptoms	Differential:
• Past medical history • Medications, diet, drugs • Syncope / near syncope • Palpitations • Pacemaker • Heart Failure • Patient awaiting heart transplant	• Ventricular tachycardia on ECG (Runs or sustained) • Conscious, no pulse • Shortness of breath • Dizziness • May not have a palpable BP	• Artifact / Device failure • Cardiac Arrest • Pump not functioning • Pump functioning – patient issue is unrelated to VAD

Patient NOT responsive to pain
AND
Capillary refill is > 3 seconds = inadequate perfusion

Patient may not have a palpable pulse or measurable BP even when pump is providing adequate circulation.
Pulse Oximetry may NOT be accurate.

Is Pump Operating?
1. Check controller screen for alarms
2. Auscultate LUQ of abdomen for a whirling sound.

NO

Controller Alarming!
Means "No Pump"
"Pump Stopped"

CONTACT VAD COORDINATOR if not already contacted

Commence CPR or follow the instruction of the VAD Coordinator

YES

ECG
Treat rhythms as per standard procedure

Asystole / PEA treat per protocol

VT/VF or Cardiovertable Rhythm

Stable Rhythm

Ensure controller is on battery power only

DEFIBRILLATE Using anterior/posterior pad placement

Continue code per cardiac arrest protocol

If patient converts

Normal Saline Up to 1L

Treat for Cardiogenic Shock per protocol prn

Types of VAD Systems

TRANSPORT TO ED

If feasible, transport the patient to their implant hospital. If not, transport to nearest hospital and contact the implant hospital for further advice.

Carbon Monoxide/Cyanide Exposure

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Carbon Monoxide – Pearls

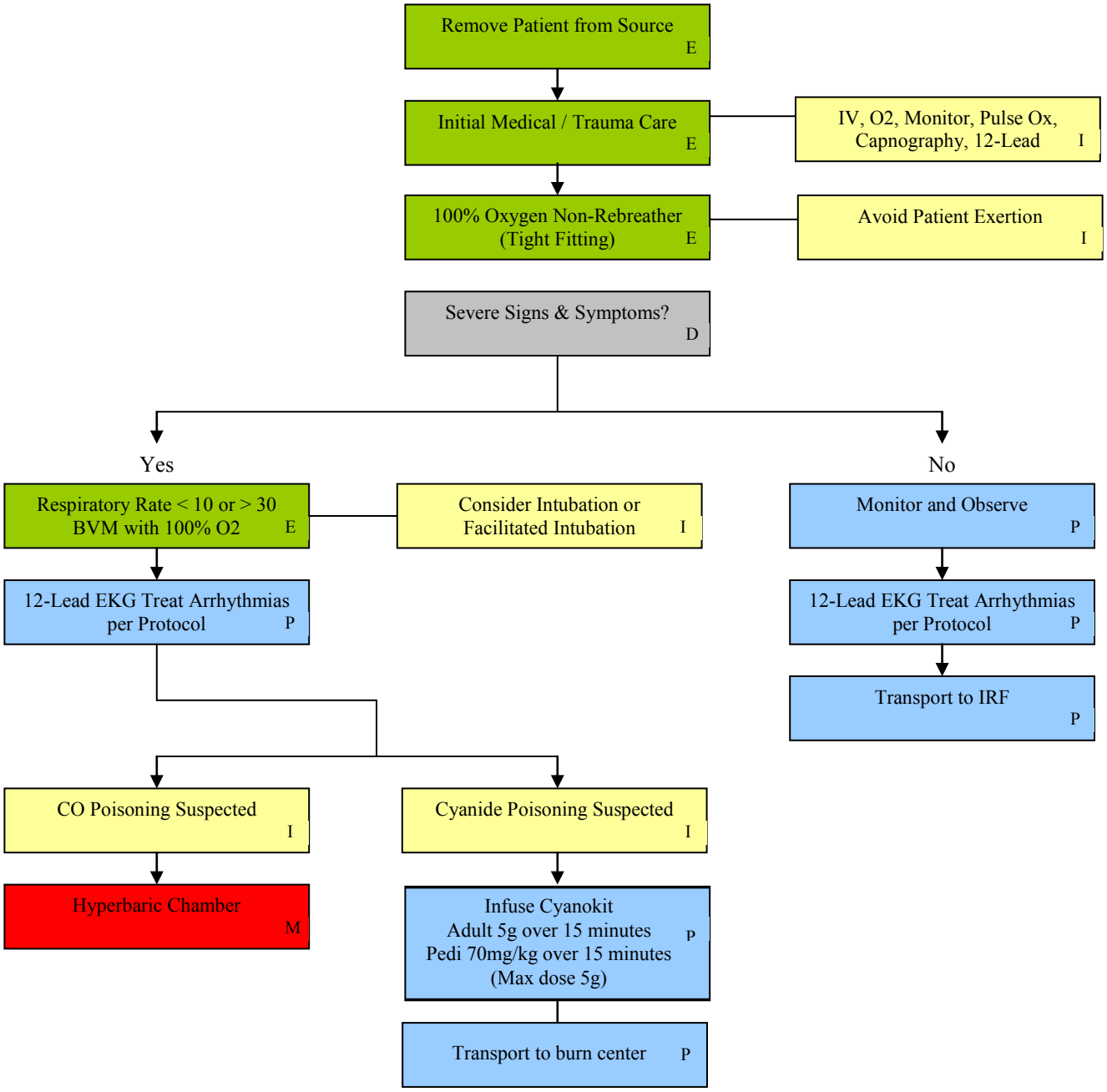
- PULSE OXIMETRY MAY INDICATE A FALSE POSITIVE.
- Document exact time oxygen was initiated and relay to receiving facility.
- Apply CAPNOGRAPHY before any medication administration.
- Due to cerebral edema caused by CO poisoning, IV fluids should be kept to a minimum unless warranted by hypotension.
- Transport arrangements will be made in conjunction with Medical Control. Consider air transport if ground transport to a HYPERBARIC CHAMBER is greater than 45 minutes.
    - **Central Florida Regional ER, Sanford (CO Poisoning Only)**
    - **Florida Hospital South ER, Orlando**
    - **Shands Hospital ER, Gainesville**
- Indications for Hyperbaric Oxygen Therapy
    - Coma
    - Period Unconsciousness

Cyanide – Pearls

- PULSE OXIMETRY MAY INDICATE A FALSE POSITIVE.
- Document exact time oxygen was initiated and relay to receiving facility.
- Apply CAPNOGRAPHY before any medication administration.
- Establish ALS and advanced airway management procedures
- Record and monitor SPCO (Carboxyhemoglobin)
- For patients with S/S of Cyanide poisoning to include exposure to an enclosed space of smoke/fire AND soot around mouth or nose AND confusion/disorientation/altered mental status
- ADULT DOSE: Infuse 5g reconstituted Cyanokit vial over 15 minutes
  PEDIATRIC DOSE: Infuse 70mg/kg reconstituted Cyanokit vial over 15 minutes (Max dose 5g)
- Transport via ground or air to closest appropriate burn center
- **Precaution: consider seperate IV line/site as Cyanokit is incompatible with Diazepam, Dopamine and Fentanyl.**
- Consider measurement of SPCO **if available** (SPCO>10 = confirmation of Cyanide poisoning)

Carbon Monoxide/Cyanide Poisoning

History:	Signs and Symptoms	Differential:
• Exposure Time	• Headache • Nausea/Vomiting • Syncope • Chest Pain • Dyspnea • Weakness • Coma/AMS • Seizures	• Acute Respiratory • Depression • Diabetes • Migraines • Meningitis • Toxicity – Alcohol – Drugs



Drug Assisted Intubation

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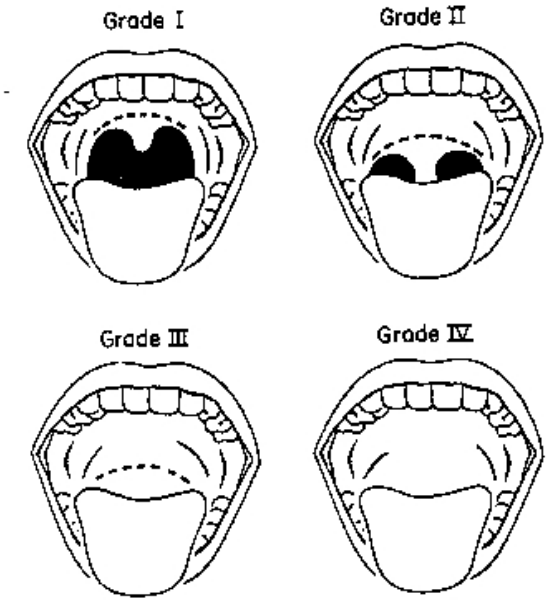
Drug Assisted Intubation – Pearls

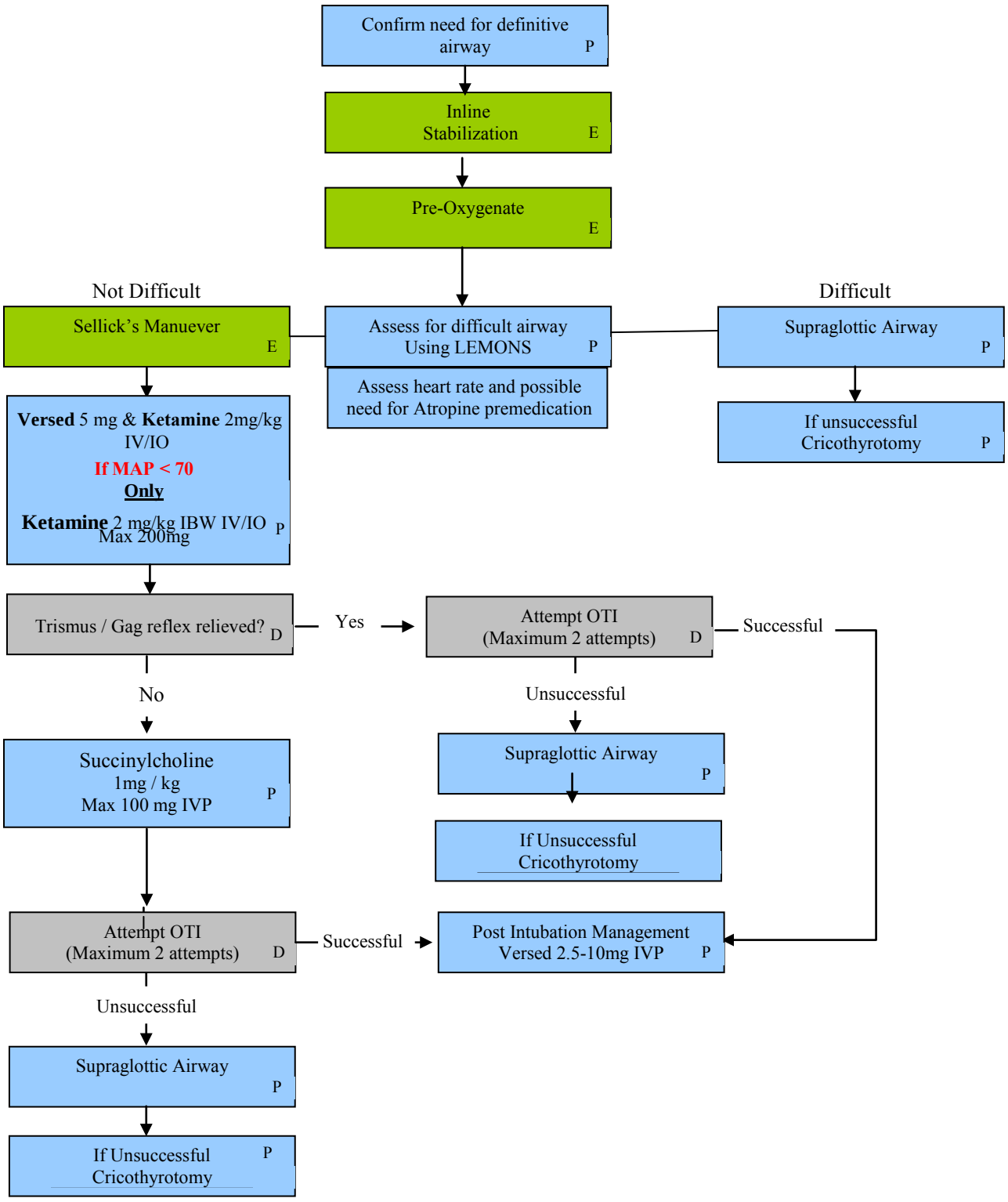
- **IBW** – Ideal Body Weight
- **VERSED** and **KETAMINE** together unless MAP is < 70.
- **If MAP is < 70 Ketamine only**
- If sedation is achieved with the use of **Versed** and **Ketamine** (i.e. the jaw relaxes and the cords are visible) then **withhold Succinylcholine**. Make a maximum of 2 attempts; if unsuccessful use the Supraglottic Airway.
- **ATROPINE:** Premedicate with Atropine 0.5 mg if HR < 50 bpm.

- **L – Look Externally**
- **E – Evaluate 3-3-2 Rule**
- **M – Mallampati Score**
- **O – Obstruction (tumor, abscess, etc.)**
- **N – Neck Mobility**



Mallampati Score Class 1-4

Drug Assisted Intubation



Esophageal Foreign Body Obstruction

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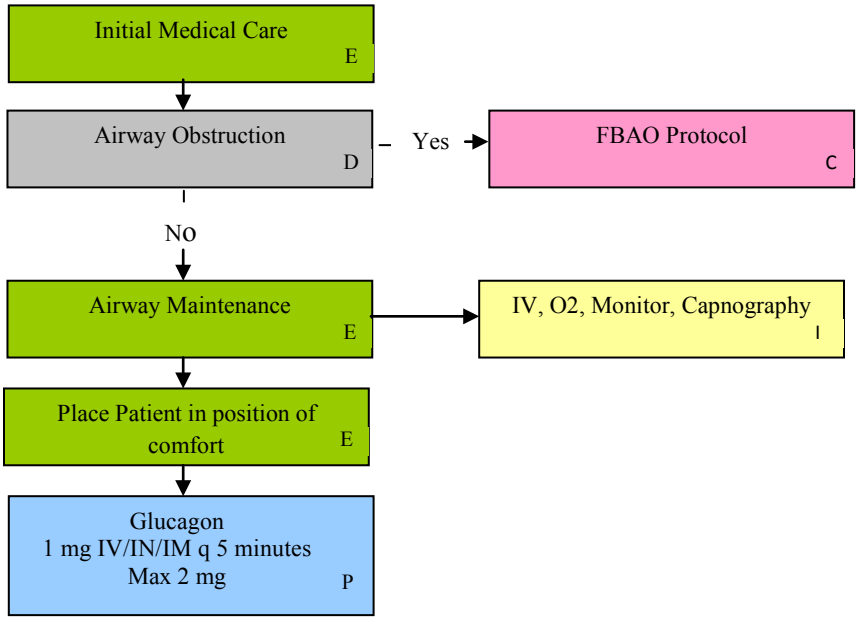
Esophageal Foreign Body Obstruction – Pearls

- Establish INITIAL MEDICAL CARE including Capnography after airway is secured. All patients should be encouraged to seek medical attention.
- Glucagon decreases lower esophageal sphincter tone without interfering with esophageal contractions (acts as a smooth muscle relaxer).
- Usually caused by food and/or bones.
- Most common obstruction among children is a coin (80%).

Esophageal Foreign Body Obstruction

History:	Signs and Symptoms	Differential:
• Partial obstruction • Complete obstruction • Esophageal CA • Esophageal strictures • Esophageal disease	• Coughing • Difficulty or inability to swallow • Drooling • Apparent distress • Anxiety/Stress • Throat pain • Gagging • Blood-stained saliva • Chest Pain	• Globus hystericus (“lump in throat”) • Esophagitits • Croup • Epiglottitis • Upper respiratory tract infection



Foreign Body Airway Obstruction

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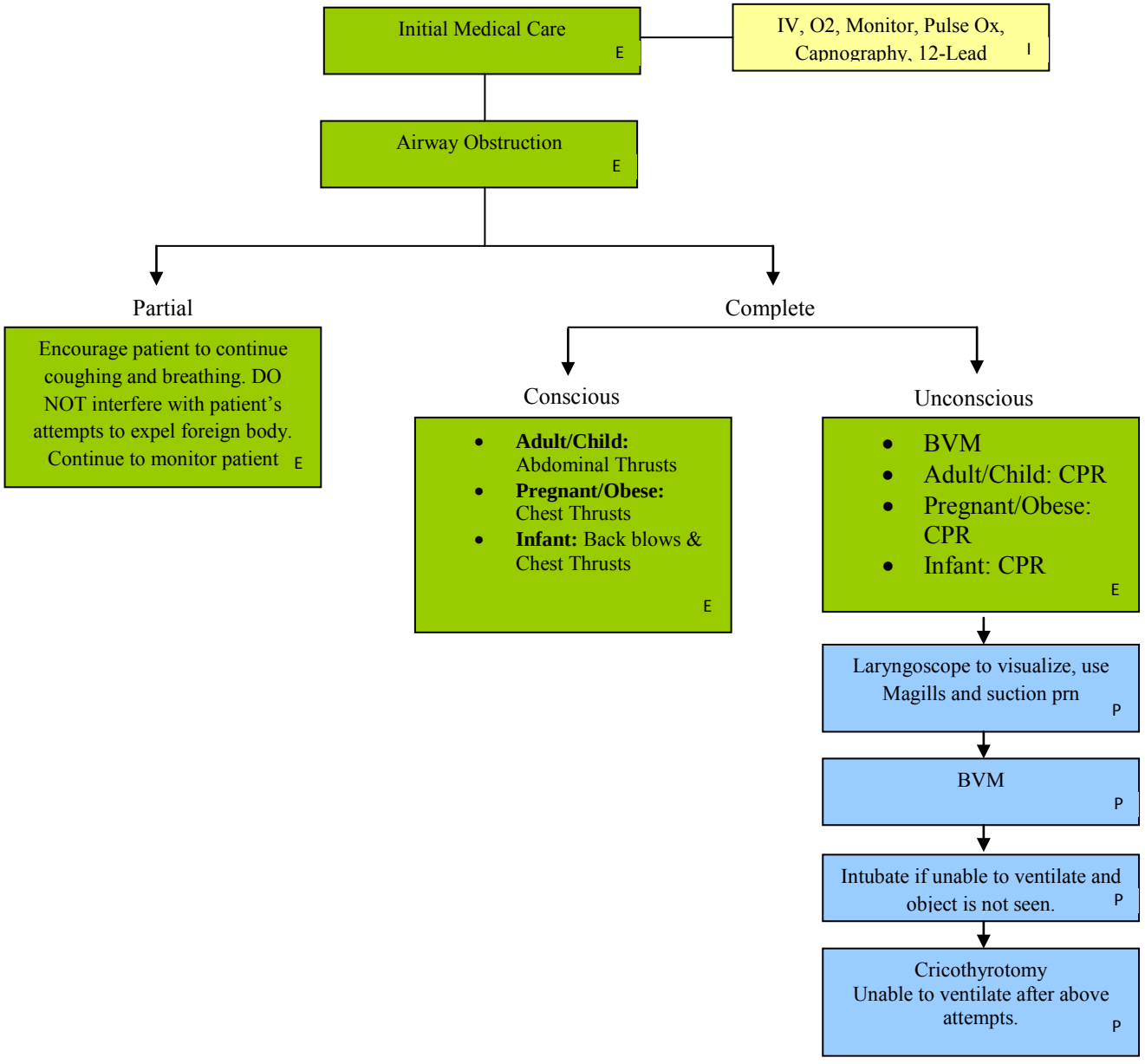
Foreign Body Airway Obstruction – Pearls

- Establish INITIAL MEDICAL CARE including Capnography after airway is secured. All patients should be encouraged to seek medical attention.
- Repeat Abdominal/Chest thrusts and/or back blows until foreign object expelled and airway is cleared or patient becomes unconscious.
- Alternate attempts to ventilate with airway clearing techniques. Once airway is cleared, support ventilations as needed with 100% oxygen.
- Monitor for signs of hypoxia and/or cardiac dysrhythmias.
- If the patient is physiologically difficult to intubate (severe anxiety, etc.) refer to DIFFICULT AIRWAY – FACILITATED INTUBATION PROCEDURE GUIDELINE.

Foreign Body Airway Obstruction

History:	Signs and Symptoms	Differential:
• Partial obstruction • Complete obstruction • Tracheal stenosis	• Coughing • Cyanosis • Choking sign (hands around neck) • Drooling • Inability to speak or cough • Apparent distress • Anxiety/Stress	• Epiglotitis • Anaphylaxis • Tonsil abscess • Fracture larynx



Respiratory Distress

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Respiratory Distress – Pearls

- If time, circumstances, and patient severity permit, apply capnography and record capnographic strip, before any medications. Continue to monitor and record strips as treatment progresses. Do not treat solely on waveform findings.
- Combine **ALBUTEROL / ATROVENT** when HR <120 and no significant ventricular ectopy. Indication: wheezing

OR

- Combine **XOPENEX / ATROVENT** when HR > 120 or if patient relates use of home nebulized medicine/prescription inhaler >3 times in the past two hours with no improvement and no significant ventricular ectopy. Indication: wheezing
- If patient presents with mild ventricular ectopy that is unresolved with aggressive oxygen therapy, **XOPENEX** is the preferred medication. If ventricular ectopy is unresolved or worsens discontinue updraft immediately.
- **ATROVENT** (500mcg) is contraindicated in patients < 12 years of age
- **XOPENEX** (0.63 mg) is contraindicated for children < 6 years of age.
- **ALBUTEROL** (2.5 mg) is indicated for all ages when given solely.
- CPAP all COPD patients with 5 - 7.5 PEEP valve.
- If patient is unable to tolerate CPAP mask, coach patient, hold mask approximately 10-20 inches away from face and slowly advance to proper placement and continue to coach patient; if all else fails remove mask.

Asthma – Pearls

- If no significant clinical improvement continue with the following:
- **MAGNESIUM SULFATE:** Indications: Acute Severe Asthma. Administered Slow IVP over 5 minutes.
- **MAGNESIUM SULFATE.**
  - Mix 1gm in 10ml NS Slow IVP. Administer over 5 minutes.
- **If still no improvement: Consider .3mg IM of EPINEPHRINE 1:1000 in an unstable patient.**

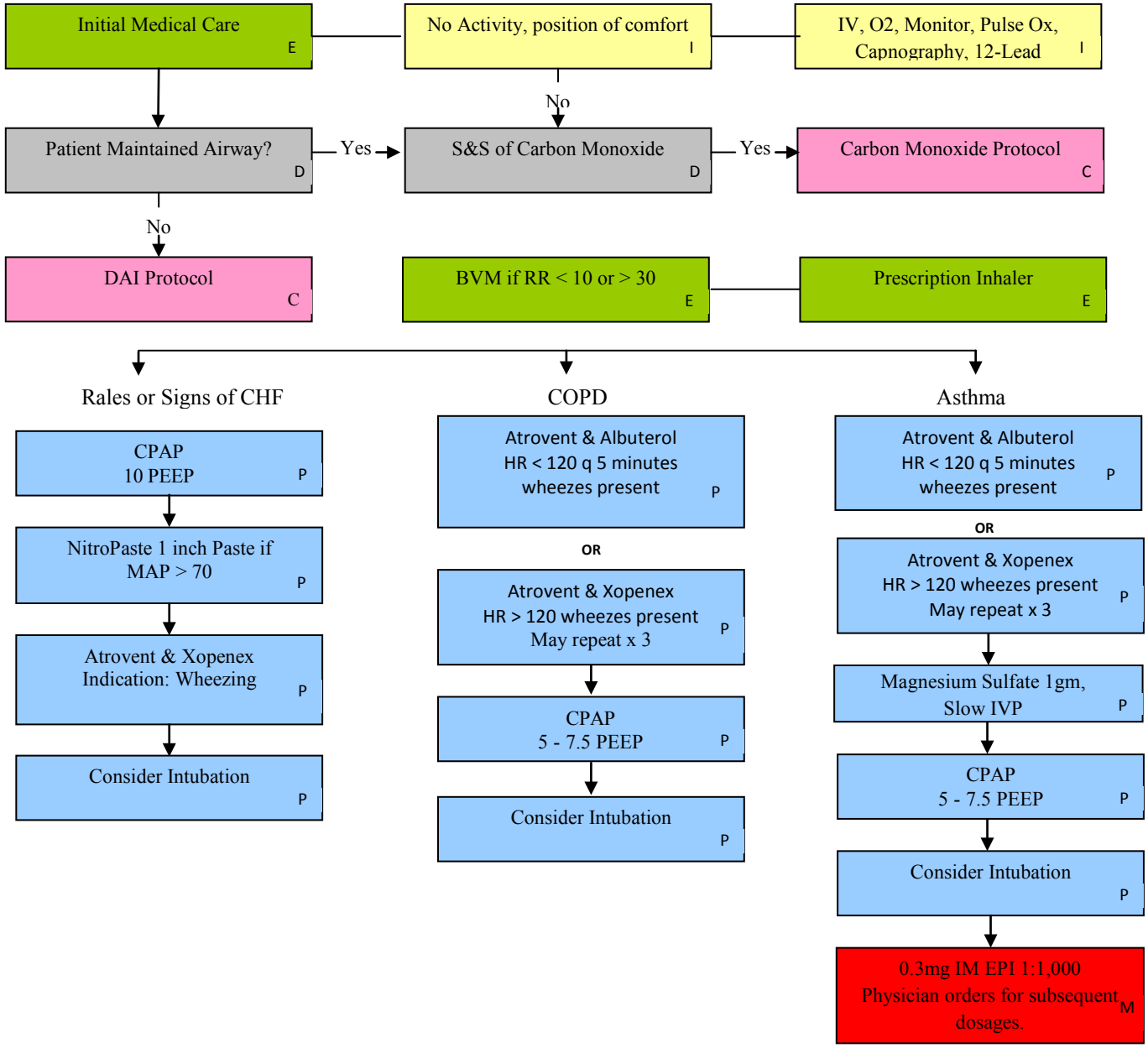
  EPI should be administered in the thigh.

Pulmonary Edema – Pearls

- Do not administer **NTG Paste** if the patient has taken phosphodiesterase (PDE) inhibitors including: Viagra, Levitra, or Cialis within the past 24 hours.
- NitroPaste: 1 inch = 14 mg
- CPAP all CHF patients with 10 PEEP valve.

Respiratory Distress

History:	Signs and Symptoms	Differential:
• Asthma; COPD – chronic bronchitis, emphysema, congestive heart failure • Home treatment (oxygen, nebulizer) • Medications (theophylline, steroids, inhalers) • Toxic exposure, smoke inhalation	• Shortness of breath • Pursed lip breathing • Decreased ability to speak • Increased resp. rate and effort • Wheezing, rhonchi, rales, stridor • Accessory muscle use • Fever, cough • Tachycardia	• Asthma • Anaphylaxis • Aspiration • COPD • Pleural effusion • Pneumonia • Pulmonary embolus • Pneumothorax • Cardiac (MI or CHF) • Pericardial tamponade • Hyperventilation • Inhaled toxin (Carbon monoxide)



Abdominal Disorder

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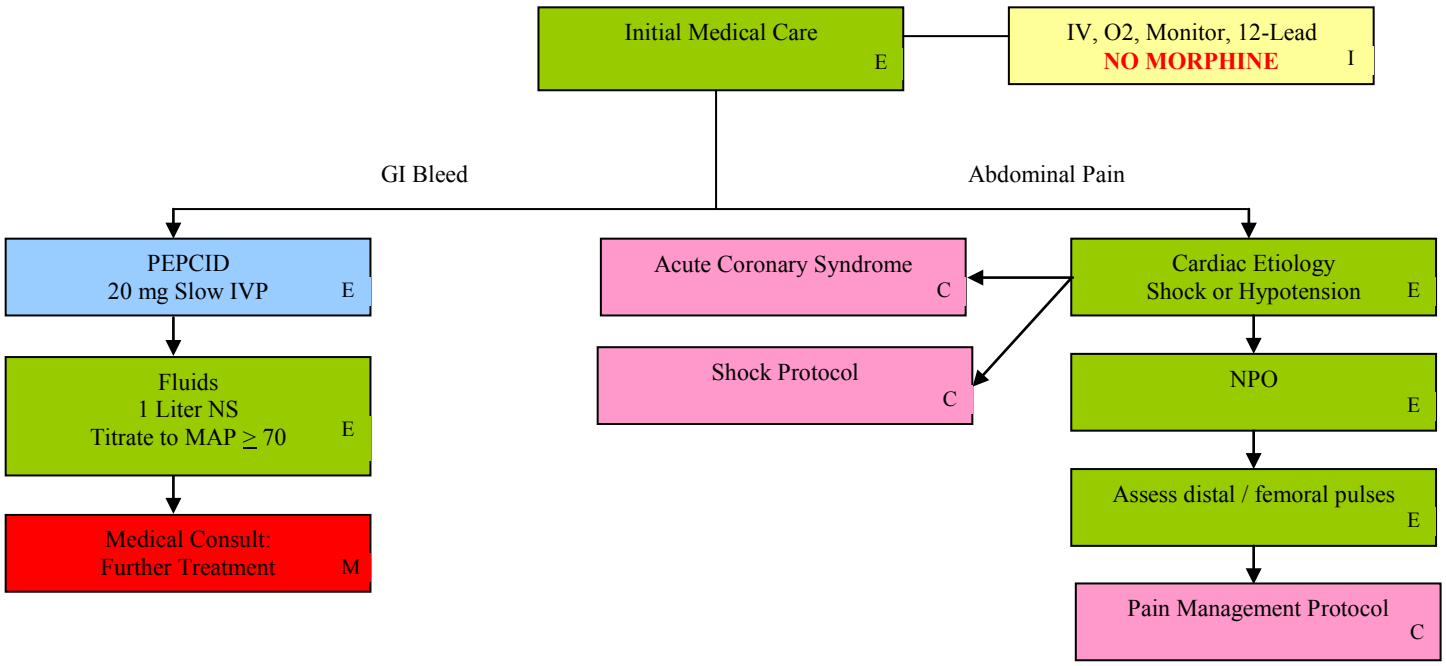
Abdominal Pain – Pearls

- Required Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neurological
- Abdominal pain in women of child bearing age should be treated as an ectopic pregnancy until proven otherwise.
- Antacids should be avoided in patients with renal disease
- Flank pain radiating to the area of the groin may represent kidney stones.
- The diagnosis of abdominal aneurysm should be considered with abdominal or flank pain in patients over 50.
- Appendicitis presents with vague, periumbilical pain, which migrates, to the RLQ over time.
- Repeat vital signs after each bolus. May give fluid bolus PRN based on vitals and patient condition.
- **NO MORPHINE FOR ABDOMINAL PAIN INSTEAD USE DILAUDID**
- **PEPCID** (20 mg IVP) a histamine H2-receptor antagonist that inhibits stomach acid production, commonly used in the treatment of peptic ulcer disease (PUD) and gastroesophageal reflux disease (GERD)
    - Rare instances of arrythmias and hypotension have been reported following rapid IV bolus
    - SLOW IVP – over 2 minutes
    - Famotidine is indicated even in the presence if hypotension

Abdominal Disorder

History:	Signs and Symptoms	Differential:
• Age • Past medical/surgical history • Medications • Onset • Palliation/Provocation • Quality (crampy, constant, sharp, dull, etc) • Region/Radiation/Referred • Pain severity (0-10) • Time (duration, repetition) • Fever • Last meal • Last BM/Urination • Menstrual history	• Pain (location/migration) • Tenderness • Nausea • Vomiting • Diarrhea • Dysuria • Constipation • Vaginal bleeding/discharge	• Abdominal aneurysm • Appendicitis • Pneumonia, pulmonary embolus • Peptic ulcer disease • Gallbladder • GERD • Myocardial infarction or Chest Pain • Liver (hepatitis) • Pancreatitis • Kidney stone • Bladder/prostrate disorder • Pelvic (PID, Ectopic pregnancy, Ovarian cyst) • Spleen enlargement • Diverticulitis • Bowel obstruction • Gastroenteritis



Allergic Reaction

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Allergic Reaction – Pearls

- Exam: Mental Status, Skin, Heart, Lungs
- Epinephrine may precipitate cardiac ischemia. These patients should receive a 12 lead ECG.
- Scrape away and remove any stingers and/or flush any contaminated skin

KNOWN ALLERGY TO: FOOD, MEDICATION, INSECT OR LATEX

Confirmed ingestion OR envenomation OR Significant signs and symptoms:

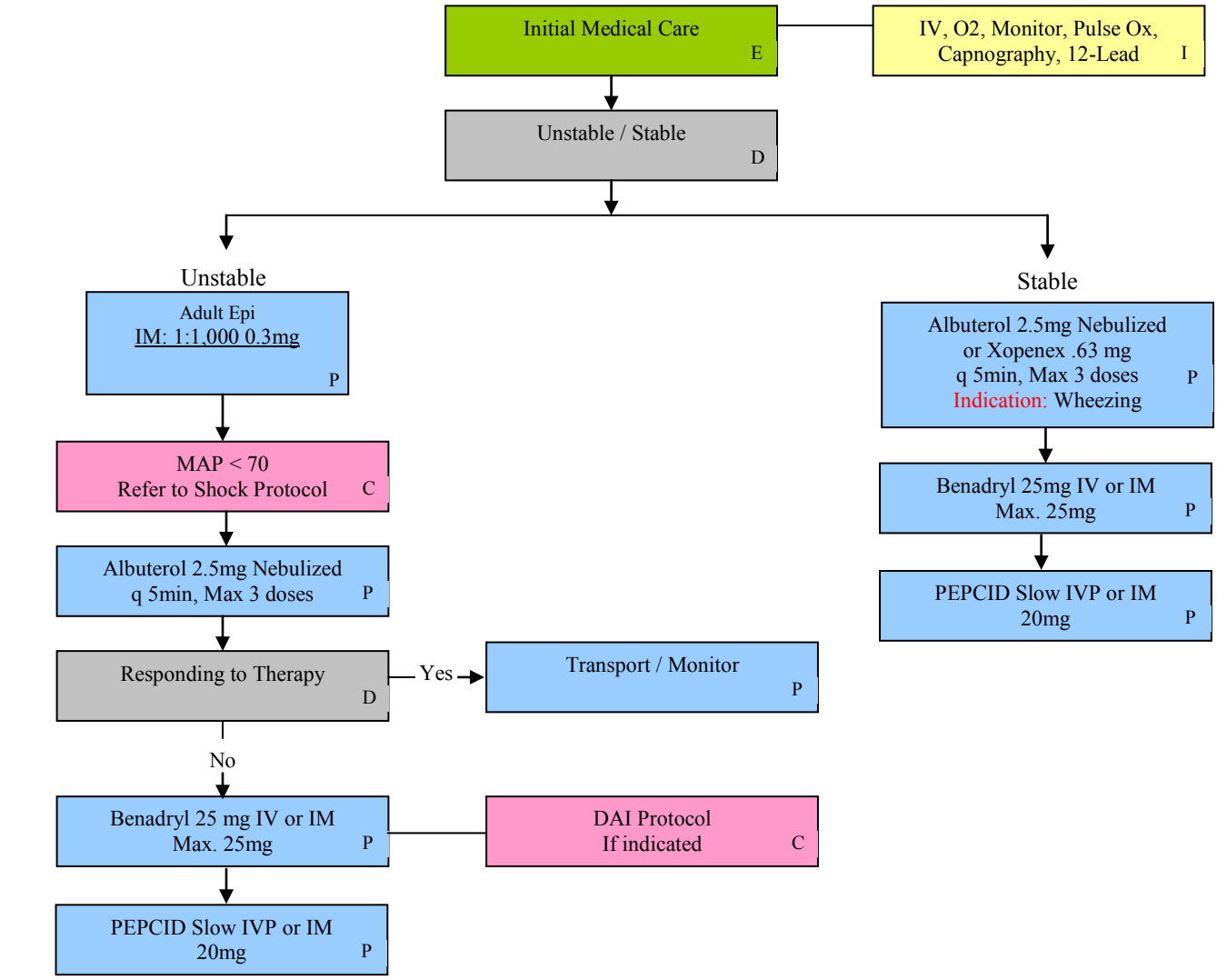
Epinephrine 1:1,000 0.3 mg SQ

Stable	Unstable
Usually longer onset (one hour or days)	Usually rapid onset 30-60 seconds
Normal vitals	Signs of Shock (MAP < 70)
Urticaria (Hives)/Rash/ Itching	Urticaria (Hives)/Rash/ Itching
Sense/Feeling of Dyspnea (Anxiety)	Objective Signs of Respiratory Distress: such as Stridor
Sense/Feeling of Orpharyngeal Swelling	Objective signs of Airway Compromise
Sense/Feeling of Throat Tightness	

- Any patient with respiratory symptoms or extensive reaction (uticaria) should receive IV or IM **BENADRYL** ***(Max Dose: 25mg if <50kg OR 50mg if >50kg).***
- The shorter the onset from symptoms to contact, the more severe the reaction.
- **PEPCID (20mg IVP)** Famotidine can be used in combination with an H1 antagonist (Benadryl) to treat and prevent urticaria caused by an acute allergic reaction.
    - Pepcid competitively inhibits the action of histamine at the histamine H2-receptors
    - SLOW IVP – over 2 minutes
    - Rare instances of arrhythmias and hypotension have been reported following rapid IV bolus
    - Famotidine is indicated even in the presence if hypotension
- **DAI**: Drug Assisted Intubation

Allergic Reaction

History:	Signs and Symptoms	Differential:
• Onset and location • Insect sting or bite • Food allergy/exposure • Medication allergy/exposure • New clothing, soap, detergent • History of reactions • Past medical history • Medication history	• Itching or hives • Coughing/wheezing or respiratory distress • Chest or throat constriction • Difficulty swallowing • Hypotensive or shock • Edema	• Urticaria (rash only) • Anaphylaxis (systemic effect) • Shock (vascular effect) • Angioedema (drug induced) • Aspiration/airway obstruction • Vasovagal event • Asthma or COPD • CHF



Altered Mental Status

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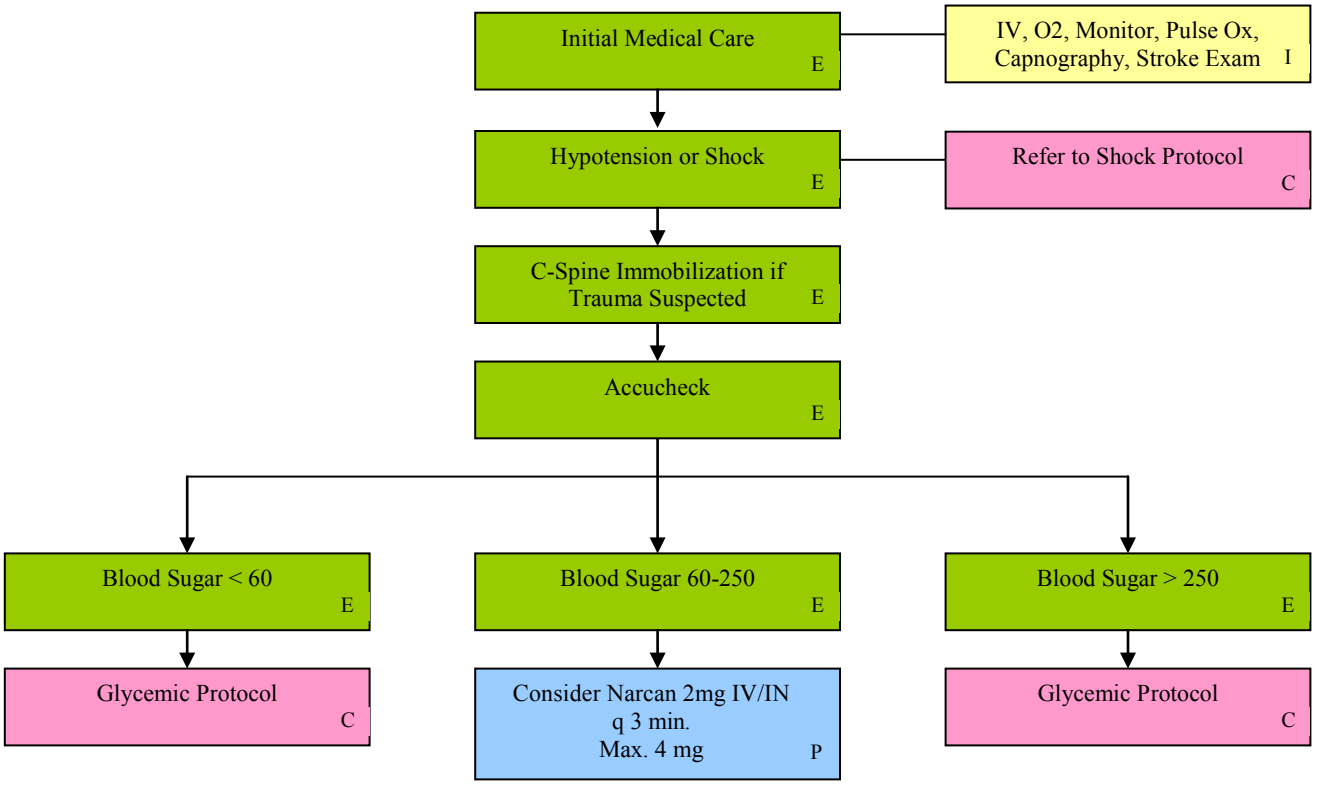
Altered Mental Status – Pearls

- Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neurological
- Be aware of Altered Mental Status as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose level after **D50** or **GLUCAGON**.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.
- Do not give oral glucose if patient cannot protect his or her own airway.
- Consider restraints if necessary for patient's and/or personnel's protection per the RESTRAINT PROCEDURE.
- Only administer **NARCAN** if there is probable cause for an opiate overdose with respiratory depression

  (i.e. constricted pupils) Max Dosage 4 mg or notify Medical Control for orders.

Altered Mental Status

History:	Signs and Symptoms	Differential:
• Known diabetic/medic alert tag • Drugs, drug paraphernalia • Report of illicit drug use or toxic ingestion • Medical history • Medications • History of trauma • Change in condition	• Decreased mental status • Change in baseline behavior • Bizarre behavior	• Head trauma • CNS (stroke, tumor, seizure, infection) • Cardiac (MI, CHF) • Infection • Thyroid • Shock • Diabetes • Toxicological • Acidosis, alkalosis • Environmental (exposure) • Pulmonary (hypoxia) • Electrolyte • Psychiatric



Cerebrovascular Accident

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Cerebrovascular Accident – Pearls

- **Cincinnati Pre-Hospital Stroke Screen: arm drift, facial drooping, slurred speech. Remember any one deficit constitutes a "STROKE ALERT"**
- Thrombolytic Screening Checklist should be completed for any suspected stroke patient.
- With an onset of symptoms less than 2 hours, scene times and transport times should be minimized. Consider delay of procedures such as IV initiation until transport is under way.
- Onset of symptoms is defined as the **time last seen normal** (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free).
- Whenever possible, a family member should accompany the patient to hospital to provide additional history and/or consent.
- The differential diagnosis listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting).
- Hypoglycemia can present as a localized neurological deficit, especially in the elderly.
- The Paramedic will determine the closest appropriate receiving hospital for patients who meet criteria for immediate transport to a comprehensive stroke center or a primary stroke facility.
- Refer to CEREBROVASCULAR ACCIDENT TRANSPORT ADMINISTRATIVE POLICY for transport destination for all stroke patients.
- As an alternative in the absence of an IV, **ZOFRAN** may be given IM (undiluted).
- Document: witness information (name and telephone numbers), symptom onset (time last seen normal), LAMS Exam, and location of any missed IV's.
- Complete FAST/LAMS check sheet.
- Begin treating BP when SBP is > 230mmHg.
- **LABETALOL SHOULD BE USED TO TREAT BLOOD PRESSURE TO 185 SYSTOLIC AND/OR 90 DIASTOLIC.**
- **LABETALOL SHOULD BE ADMINSTERED OVER 5 MINUTES.**

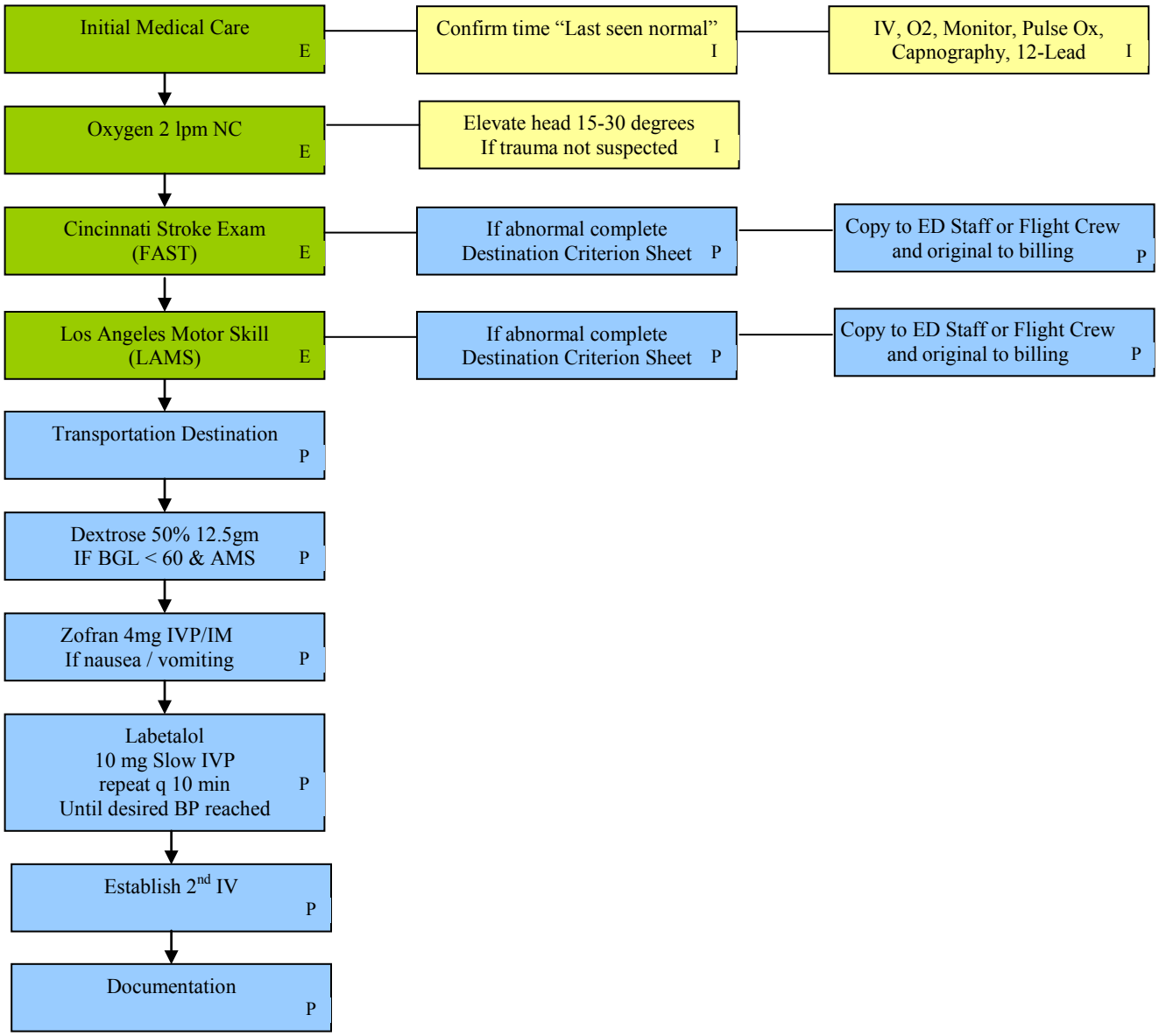
There is an 85% chance of a hemorrhagic stroke if the patient meets the following four criteria:

- **GCS of < 8**
- **Seizures**
- **BP ≥ 220/120**
- **Sudden witnessed LOC**

Cerebrovascular Accident

History:	Signs and Symptoms	Differential:

• Previous CVAs / TIAs
• Previous cardiac/vascular surgery
• Assoc diseases: DM, HTN, CAD
• Atrial Fibrillation
• Medications
• History of trauma
	• AMS
	• Weakness / paralysis
	• Blindness or other sensory loss
	• Aphasia / Dysarthria
	• Syncope
	• Vertigo / Dizziness
	• Vomiting
	• Headache
	• Seizures
	• Respiratory pattern change
	• HTN / hypotension
		• AMS
		• TIA
		• Seizure
		• Hypoglycemia
		• Stroke
		  • Thrombotic (~85%)
		  • Embolic
		  • Hemorrhagic (~15%)
		• Tumor
		• Trauma



Drug Overdose

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Drug Overdose – Pearls

- **Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, and Neurological.**
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, and emesis to ED.
- Common Signs and Symptoms from overdoses:
    - **Tricyclic:** 4 major areas of toxicity: seizures, tachy dysrhythmias, hypotension, decreased mental status or coma;
        - Rapid progression from alert mental status to death.
    - **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure.
    - **Depressants:** decreased HR, decreased BP, decreased temperature, and decreased respirations, non-specific pupils.
    - **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures.
    - **Anticholinergic:** increased HR, increased temperature, dilated pupils, and mental status changes.
    - **Cardiac Meds:** dysrhythmias and mental status changes.
    - **Solvents:** nausea, vomiting, and mental status changes.
    - **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
    - Do Not give Beta Blockers to Cocaine overdoses.
- Consider contacting the Florida Poison Control Center for guidance: **1-800-222-1222.**

The American Association of Poison Control Centers will assume responsibility and provide home management and follow-up per their standard operating protocols as required by Florida Statutes 401.23(13) and 395.1027. Dispatch can cancel the call via Poison Network's Authority.

Drug Overdose & Poisoning

History:	Signs and Symptoms	Differential:
• Ingestion or suspected ingestion of potentially toxic substance • Substance ingested, route, qty. • Time of ingestion • Reason (suicidal, accidental) • Available meds in home • Medical history • Medications	• Mental status changes • Hypotension • Hypertension • Bradypnea • Tachycardia • Dysrhythmias • Seizures	• TCA • Tylenol • Depressants • Stimulants • Anticholinergic • Cardiac meds • Solvents, Alcohols, Cleaning agents • Insecticides

Ensure Scene Safety, Use Caution & Refer to Hazmat if needed I

Initial Medical Care E

IV, O2, Monitor, Pulse Ox, Capnography, 12-Lead I

Oxygen 2 lpm NC E

Accucheck E

Glycemic Emergencies C

Altered Mental Status E

Altered Mental Status C

Narcan 2mg IV/IN Max. 4 mg P

Contact Poison Control 1-800-222-1222 E

Glycemic Emergencies

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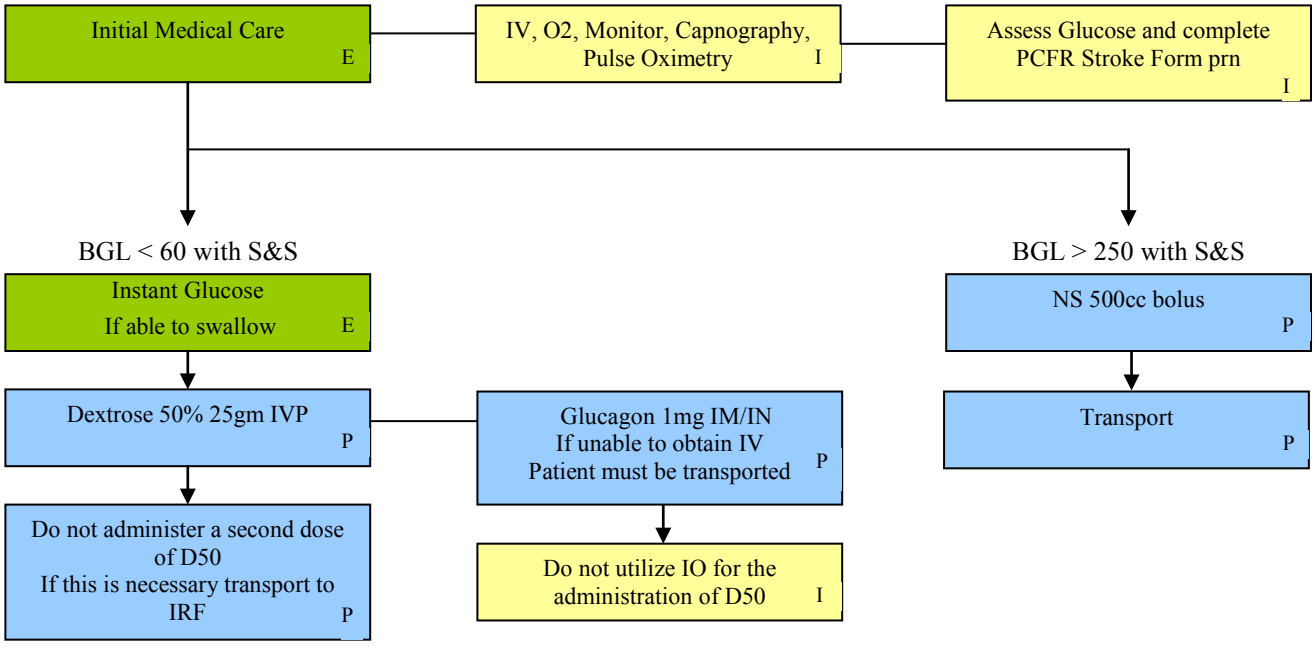
Glycemic Emergencies – Pearls

- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Recheck blood glucose after administration of **INSTANT GLUCOSE, D50**, or **GLUCAGON**.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.
- **INSTANT GLUCOSE: If a patient is stable and can protect their airway utilize oral glucose first.**
- Do not give oral glucose if patient cannot protect own airway.
- There may be times when patients refuse further treatment or transport after hypoglycemic episode. These patients will be allowed to refuse transport under the following criteria:
    - **REFER TO REFUSAL OF SERVICE ADMINISTRATIVE POLICY**

- **Minimize the number of IV attempts (< 3) in these patients. If unable to establish IV utilize IM/IN Glucagon.**
- **All patients receiving IM/IN Glucagon must be transported to the IRF.**
- **Interosseus (I.O.) administration of D50 is not authorized unless the patient is in cardiac arrest. Administer IM/IN Glucagon and transport to IRF.**

Glycemic Emergencies (Hypo/Hyperglycemia)

History:	Signs and Symptoms	Differential:
• Onset and Duration • History of hypertension • Seizures • Medical History • Pre-Eclampsia • Drug or alcohol use • Head trauma • Current medications • Allergies	• Headache • Nose bleed • Dizziness • Syncope • Weakness • Speech difficulties • Abdominal pain • Visual disturbances • Projectile vomiting	• Altered mental status • Hypoglycemia • Hyperglycemia • Trauma • CNS disorders



Hypertensive Crisis

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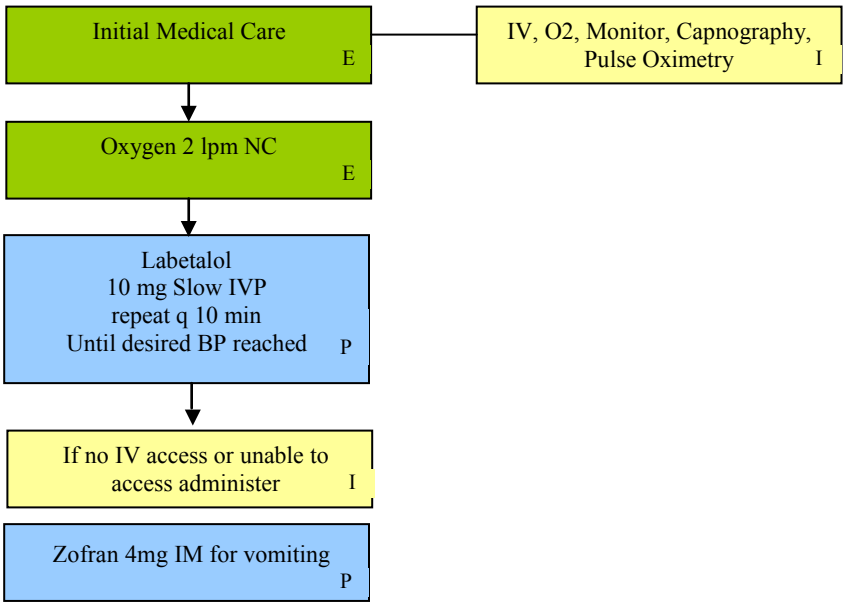
Hypertensive Crisis – Pearls

- If patient is hypoxic, apply appropriate oxygen adjunct with appropriate oxygen flow.
- **LABETALOL** is contraindicated for hypotension, bradycardia, AV blocks, heart failure, COPD, or asthma.
- **LABETALOL Slow IV Push over 5 min**
- **Treatable at 230 systolic and/or 120 diastolic**
- **Treat BP to end point of 185 systolic and/or 90 diastolic**
- **NTG will not be utilized in these patients**
- As an alternative in the absence of an IV, **ZOFRAN** may be given IM (undiluted).
- Never treat hypertension based on one set of vital signs.
- All symptomatic patients with hypertension should be transported with their head elevated 15 -30 degrees.

Hypertensive Crisis

History:	Signs and Symptoms	Differential:
• Onset and Duration • History of hypertension • Seizures • Medical History • Pre-Eclampsia • Drug or alcohol use • Head trauma • Current medications • Allergies	• Headache • Nose bleed • Dizziness • Syncope • Weakness • Speech difficulties • Abdominal pain • Visual disturbances • Projectile vomiting	• Altered mental status • Hypoglycemia • Trauma • Major surgery < 14 days



Hyperthermia, Non-Environment

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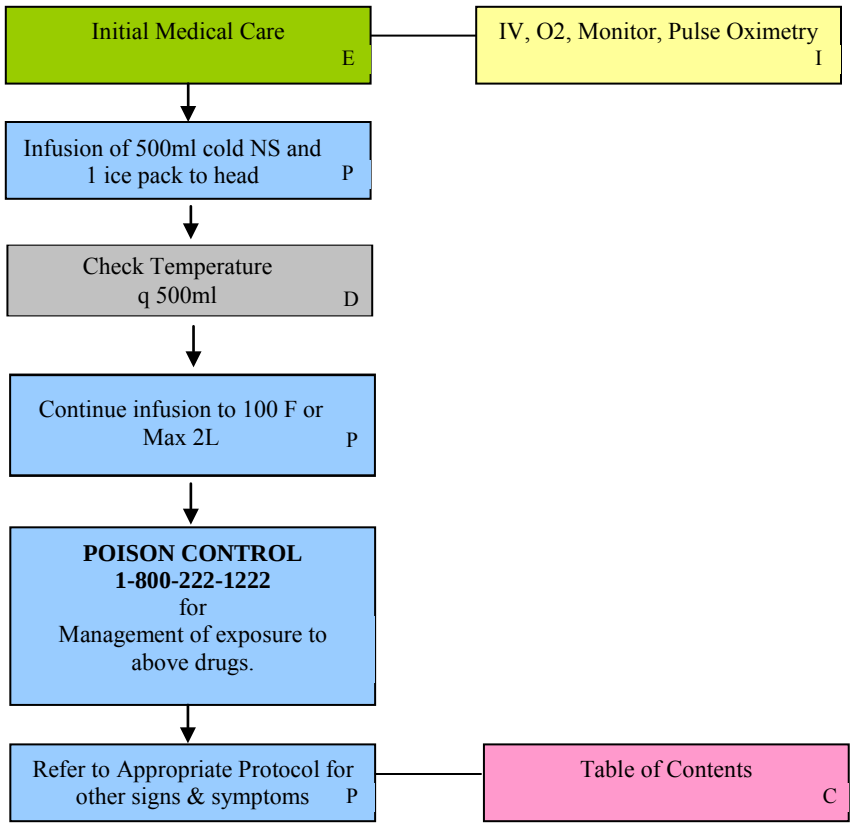
Hyperthermia, Non-Environmental – Pearls

- A temperature of 102 degrees F or higher.
- Do not decrease temperature below 100 degrees.
- Causes include but are not limited to: infectious disease (most common), anesthesia (malignant hyperthermia), and drug use.
- Cocaine, Amphetamines, and Salicylates (i.e. Aspirin) may elevate body temperature.
- If OD suspected contact POISON CONTROL: 1-800-222-1222.

The American Association of Poison Control Centers will assume responsibility and provide home management and follow-up per their standard operating protocols as required by Florida Statutes 401.23(13) and 395.1027. Dispatch can cancel the call via Poison Network's Authority.

Hyperthermia, Non-Environmental

History:	Signs and Symptoms	Differential:
• Age • Duration of fever • Severity of fever • Medical history • Medications • Immunocompromised • Environmental exposure • Last acetaminophen or ibuprofen	• Warm • Flushed • Sweaty • Chills/Rigors Associated symptoms: • Myalgias, cough, chest pain, headache, dysuria, abdominal pain, AMS, rash, stiff neck	• Infections/sepsis • Cancer/tumors/lymphomas • Medication or drug reaction • Arthritis/vasculitis • Hyperthyroid • Heat stroke • Meningitis • Cocaine/PCP



Psychological & Behavioral Emergencies

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Psychological Emergency – Pearls

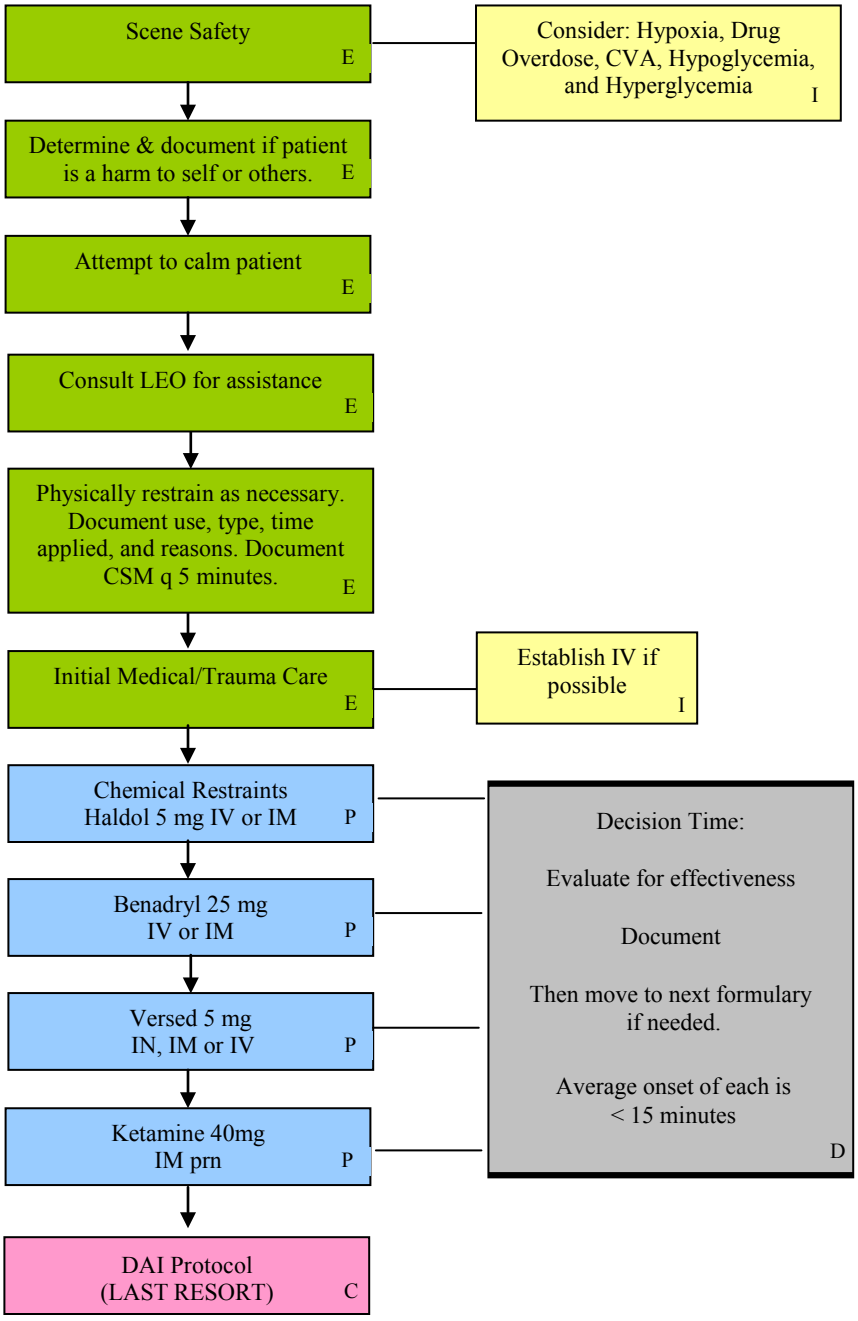
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc).
- Do not overlook the possibility of associated domestic violence or child abuse.
- Contact Law Enforcement ASAP
- **A Paramedic must continuously observe all patients who receive physical or chemical restraint.**
- **Chemical restraints should only be utilized when physical restraints either fail or patient continues to be a danger to themselves and the crew**
- **HALDOL can be given IV or IM**

- **For patients with extreme agitation that interferes with patient care or crew safety pharmacologic agents may be used as a last resort. (DAI Protocol)**

- **At a minimum Law Enforcement must follow transport unit to the closest appropriate psychiatric facility (Lakeland Regional Medical Center or Winter Haven Hospital)**

Psychological & Behavioral Emergencies

History:	Signs and Symptoms	Differential:
• Situational crisis • Psychiatric illness/medications • Injury to self/others • Medic alert tag • Substance abuse/overdose • Diabetes	• Anxiety, agitation, confusion • Hallucinations • Delusional thoughts • Bizarre behavior • Combative/violent • Expression of suicidal/homicidal thoughts	• See AMS differential • Hypoxia • Alcohol intoxication • Medication effect/overdose • Withdrawal syndromes • Depression • Bipolar disorder • Schizophrenia, anxiety disorders • Anxiety



Seizures

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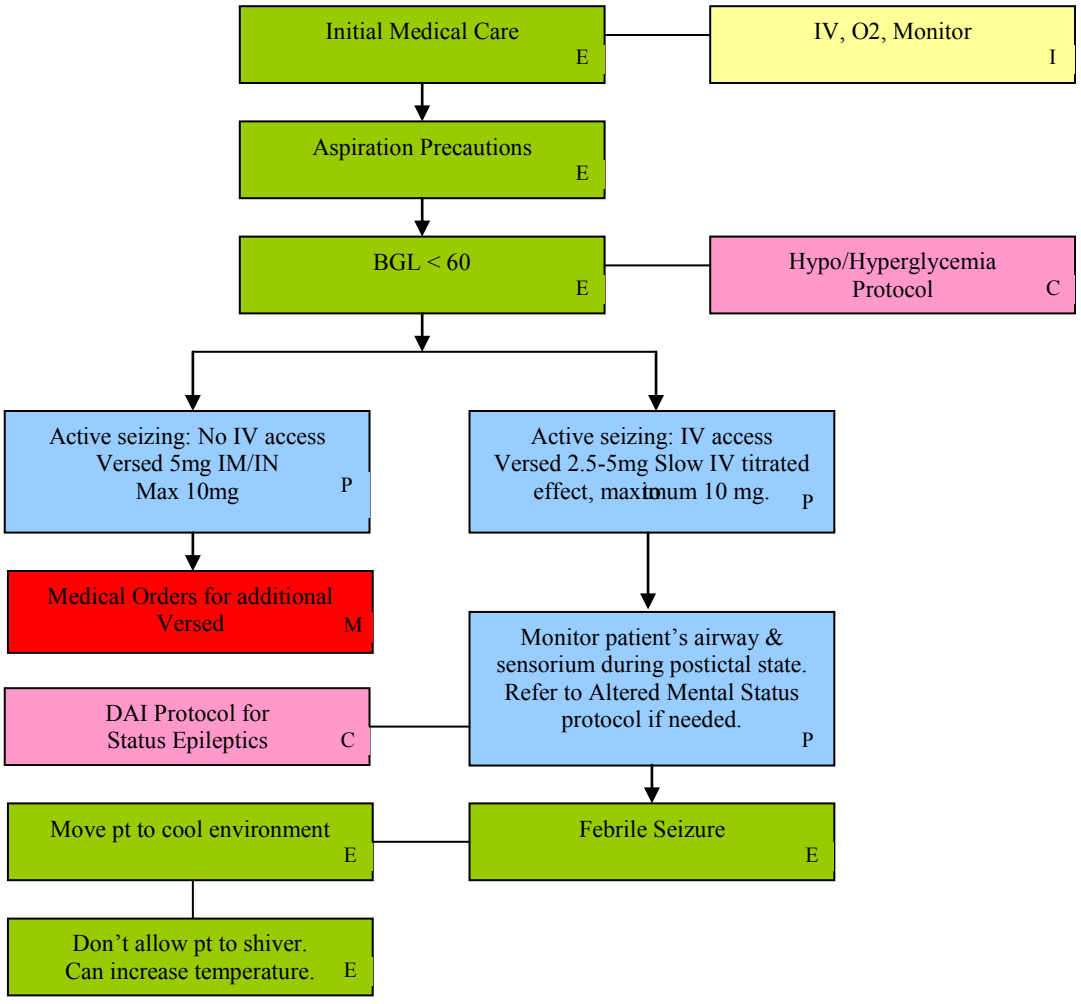
Seizures – Pearls

- **Any actively seizing patient on arrival shall have IM/IN Versed administered as a first line intervention.**
- After IM/IN Versed establish IV access, if possible. If unable to obtain IV access repeat IM/IN Versed to max of 10mg
- If IV is already established then refer to IV access
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures (petit mal)** effect only a part of the body and are not usually associated with loss of consciousness.
- **Jacksonian seizures** are seizures which start as a focal seizure and become generalized (grand mal).
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations, especially if Versed is used.
- For any seizure in a pregnant patient, follow the OB Emergencies protocol.
- DAI: Drug Assisted Intubation

Seizures

History:	Signs and Symptoms	Differential:
• Reported/witnessed seizure • Seizure history • Medical alert tag info • Seizure medications • History of trauma • History of diabetes • History of pregnancy	• Decreased mental status • Sleepiness • Incontinence • Observed seizures • Evidence of trauma • Unconscious	• CNS trauma • Tumor • Hypoxia • Electrolyte abnormality • Drugs, medications • Infection/fever • Alcohol withdrawal • Eclampsia • Stroke • Hyperthermia • Hypoglycemia



Shock

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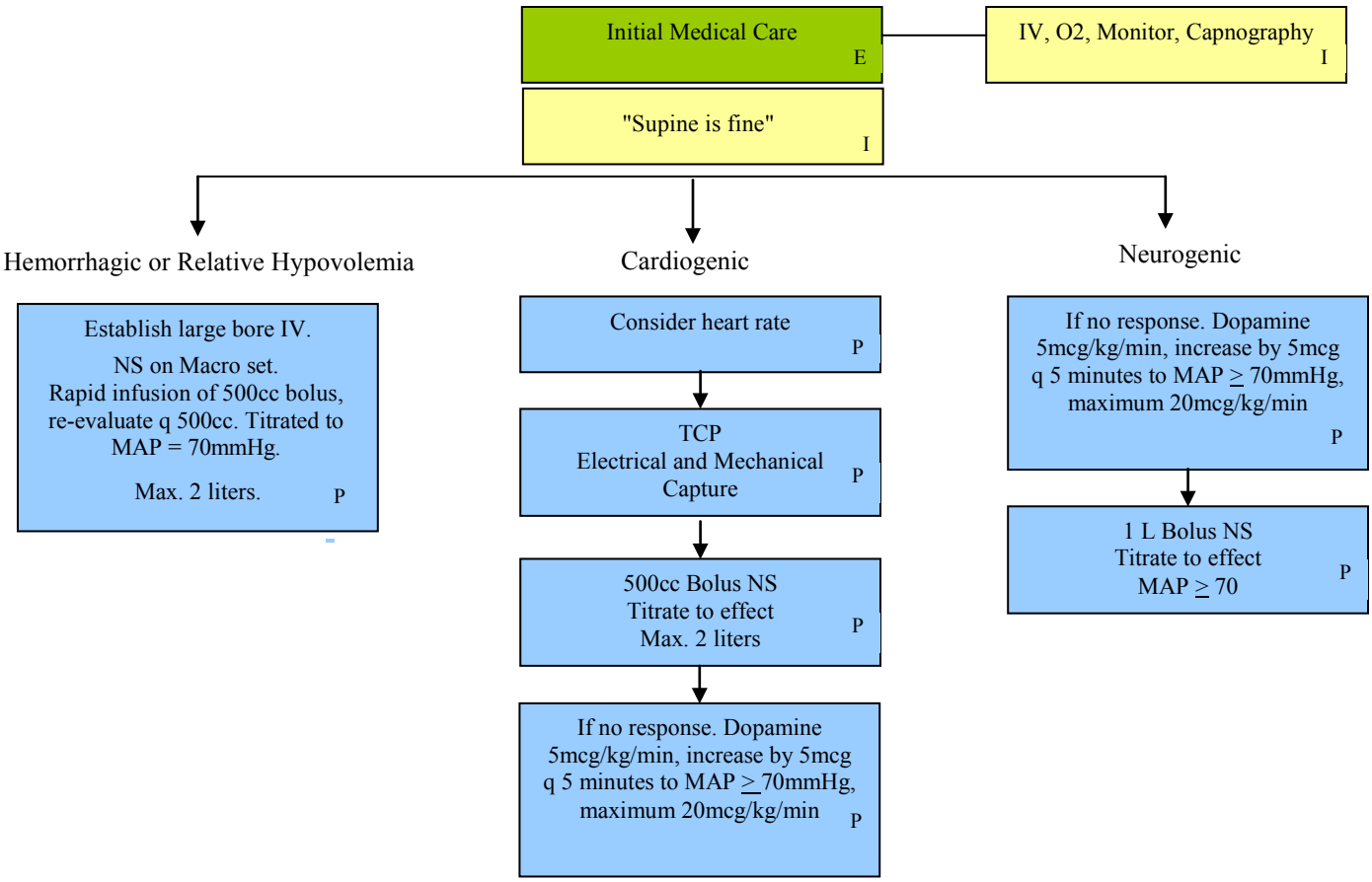
Shock – Pearls

- Hypotension can be defined as a systolic blood pressure of less than 90.
- Consider performing orthostatic vitals signs on patients in non-trauma situations if suspected blood or fluid loss.
    - Positive orthostatic changes:
        - Decrease in systolic blood pressure by 10 mmHg or
        - Increase in pulse rate by 10 beats per minute.
- Consider all possible causes of shock and treat per appropriate protocol.
- Neurogenic Shock – Pressors needed to maintain BP

Trendelenburg is no longer required in shock patients ... "Supine is fine".

Shock

History:	Signs and Symptoms	Differential:
• Blood loss • Fluid loss: vomiting, diarrhea, fever • Infection • Cardiac ischemia • Medications • Allergic reaction • Pregnancy • History of poor oral intake	• Restlessness, confusion • Weakness, dizziness • Weak, rapid pulse • Pale, cool, clammy skin • Delayed cap refill • Hypotension • Coffee-ground emesis • Tarry stools	• Ectopic pregnancy • Dysrhythmias • Pulmonary embolus • Tension Pneumothorax • Medication effect/overdose • Vasovagal • Physiologic



Sickle Cell Anemia Crisis

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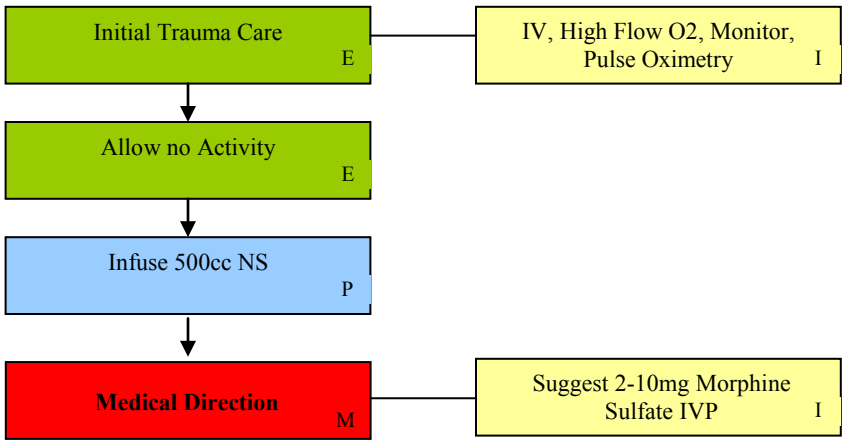
Sickle Cell – Pearls

- More prevalent in African American population
- High Flow O2 via NRB

Sickle Cell Anemia Crisis

History:	Signs and Symptoms:	Differential:
• Age • Medications • Medical history	• Severe dyspnea • Severe pain to any large muscle mass • Priapism • Abdominal Cramping	• Abdominal pain of different etiology. • Chest Pain • Acute Chest Syndrome • Joint Ischemia



SIRS / Sepsis

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SIRS / Sepsis / Shock – Pearls:

SIRS is Systemic Inflammatory Response Syndrome

Key priority in care of patient with severe sepsis:

- Recognize the patient has severe sepsis.
- Identify as early as possible patients with overt shock.
- Provide emergent support for failing or dysfunctional organs; (shock treatment).
- Antibiotics started within 60 min. of diagnosis of severe sepsis (with or without shock.)
- Provide timely source control of infection.

- **DOPAMINE:** Increase in 5 mcg/kg/min increments q 5minutes until you reach a MAP of 70 or greater.

(2 x Diastolic) + Systolic / 3 = MAP (MAP can also be found next to the BP on the MRX monitor)

Dopamine drip: 400mg in 250ml D5W: 1600mcg/ml solution.

Weight (kg)	5mcg/kg/min	10mcg/kg/min	15mcg/kg/min	20mcg/kg/min
40	8	15	23	30
50	9	19	28	38
60	11	23	34	45
70	13	26	39	53
80	15	30	45	60
90	17	34	51	68
100	19	38	56	75
110	21	41	62	83
120	23	45	68	90

IF MAX DOSE OF DOPAMINE REACHED AND MAP STILL <70mmHg

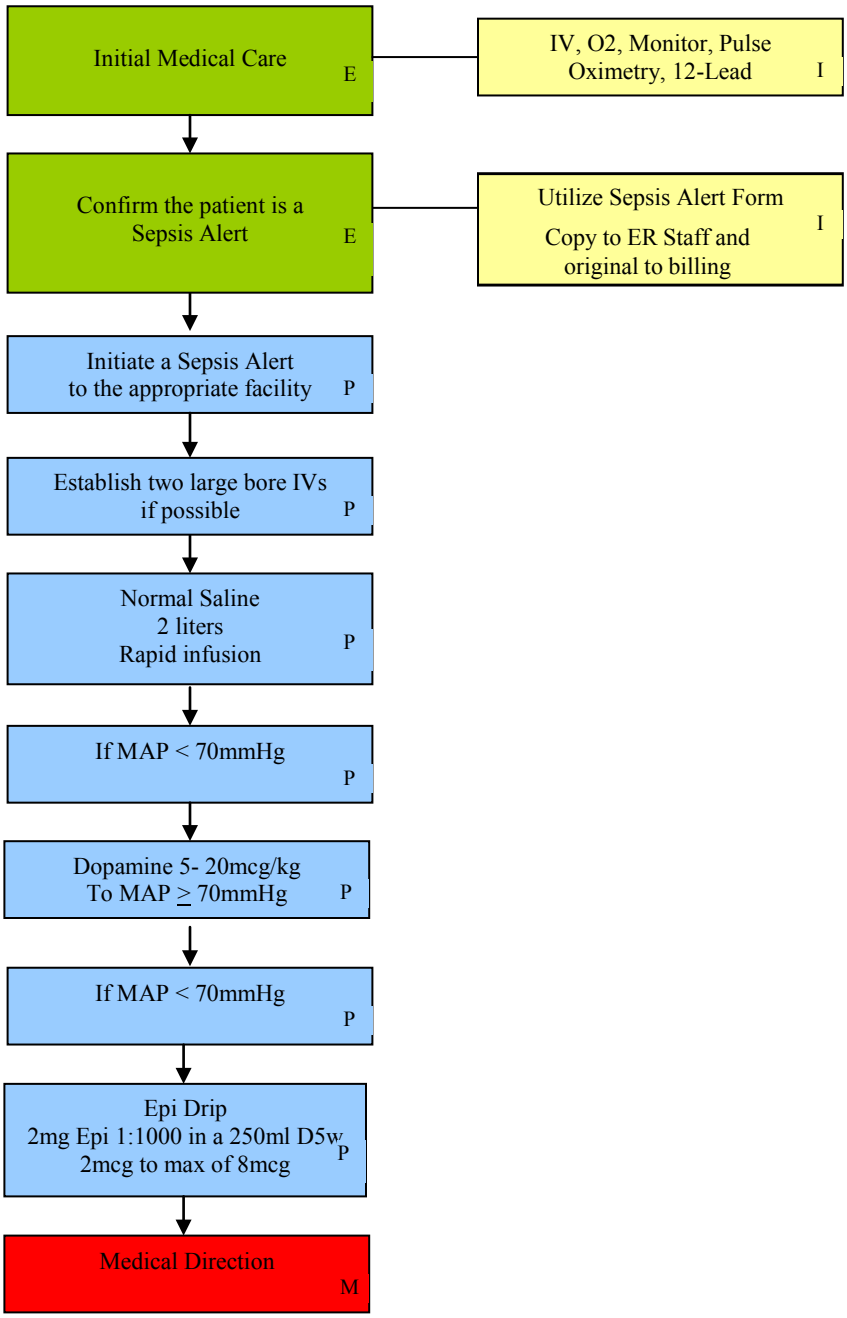
- **EPI drip:** Initial dose 2mcg/min; increase by increments of 2mcg Q5 minutes to max dose of 8mcg/min.

EPI drip: 2mg of 1:1000 Epi in 250ml D5W: 8mcg/ml solution.

15 drips per min	1 drip per 4 seconds	2 mcg
30 drips per min	1 drip per 2 seconds	4 mcg
45 drips per min	3 drips per 4 seconds	6 mcg
60 drips per min	1 drip per second	8 mcg

SIRS / Sepsis

History:	Signs and Symptoms	Differential:
• Medications • Infection • Indwelling catheters • Immunocompromised patients: (i.e. cancer, sickle cell, nursing home, low WBC, HIV) • Burns • Open wounds • Fluid loss: vomiting, diarrhea, fever	• Confusion • High fever • Accelerated breathing • Accelerated heart rate • Low blood pressure • Rash	• Acute Renal Failure • Acute Respiratory Distress Syndrome • Adrenal Insufficiency and Adrenal Crisis • Diabetic Ketoacidosis • Drug overdose • Heatstroke • Pulmonary Embolism • Shock • Toxins



Syncope, Near Syncope, General Weakness

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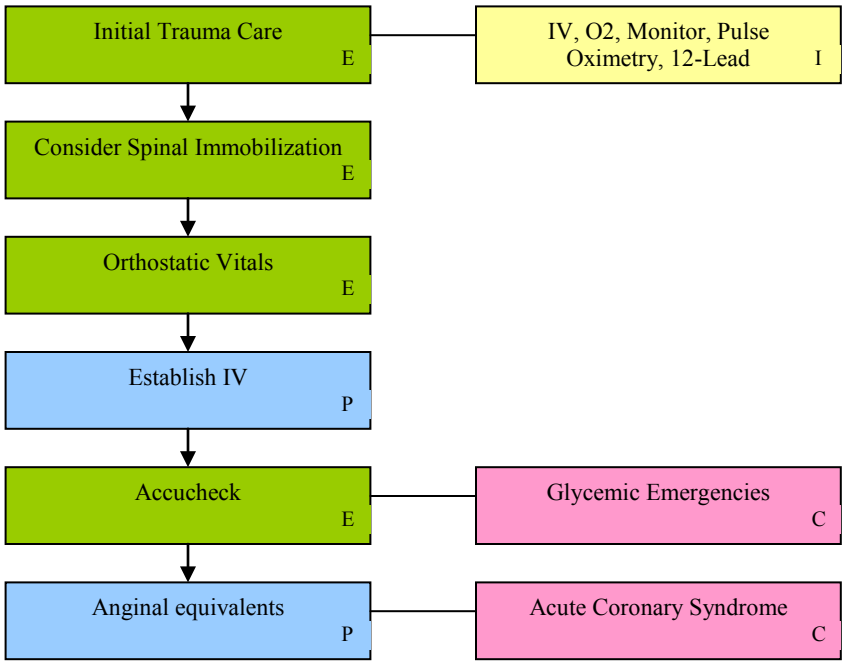
Syncope, Near Syncope – Pearls

- Assess for signs and symptoms of trauma
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- **ALL** patients should be transported.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.
- Orthostatic changes:
    - Lying, Sitting, Standing: Increased heart rate – decreased BP when sitting and/or standing.

Supine position is definitive care ... "Supine is fine".

Syncope, Near Syncope, & General Weakness

History:	Signs and Symptoms	Differential:
• History cardiac, stroke, seizure • Occult blood loss • Females: LMP, vaginal bleeding • Fluid loss: vomiting, diarrhea • Medical history • Medications	• Loss of consciousness with recovery • Lightheadedness, dizziness • Palpitations, slow or rapid pulse • Irregular pulse • Decreased blood pressure	• Stroke • Hypoglycemia • Seizure • Shock • Toxicologic • Medication effect • Vasovagal • Orthostatic hypotension • Cardiac syncope • Psychiatric



Animal or Human Bite

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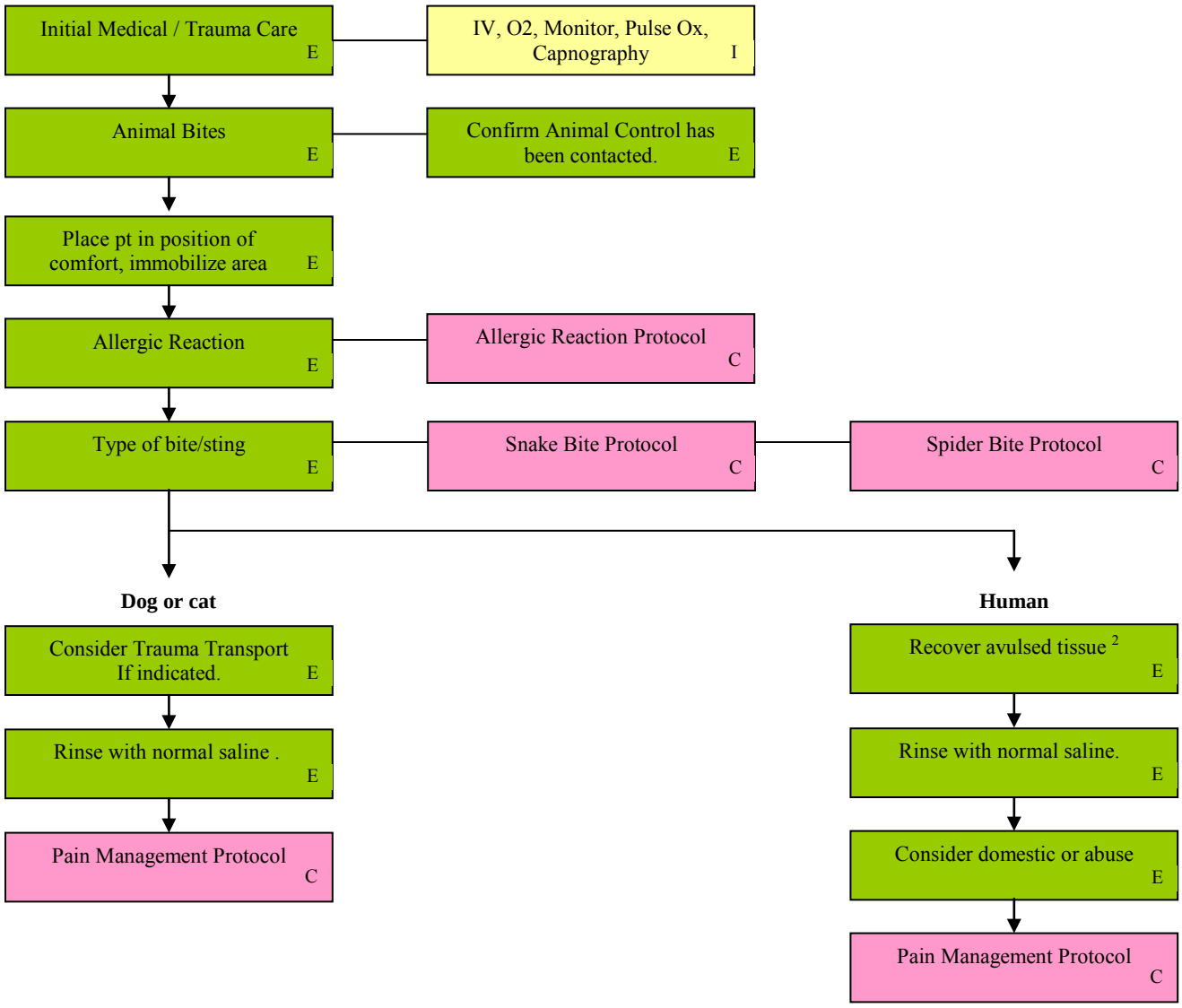
Animal or Human Bite – Pearls

- Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neurological exam if systemic effects are noted.
- Human bites are much worse than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
- Cat bites may progress to infection rapidly due to the bacteria (Pasteurella multicoda)..

Animal or Human Bite

History:	Signs and Symptoms	Differential:
• Type of bite/sting • Description/photo of insect/animal/ snake • Time, location, size of insult • Previous reaction to like same • Domestic vs. wild/feral • Tetanus and rabies risk • Immuno-compromised patient • Does animal appear healthy • Prior first aid	• Rash, skin break, wound • Pain, soft tissue swelling, redness • Blood oozing from wound • Evidence of infection • Shortness of breath, wheezing • Allergic reaction, hives, itching • Hypotensive or shock	• Animal bite • Human bite • Snake bite • Spider bite • Insect sting/bite • Marine sting/bite • Infection risk • Rabies risk • Tetanus risk • MRSA



Burns

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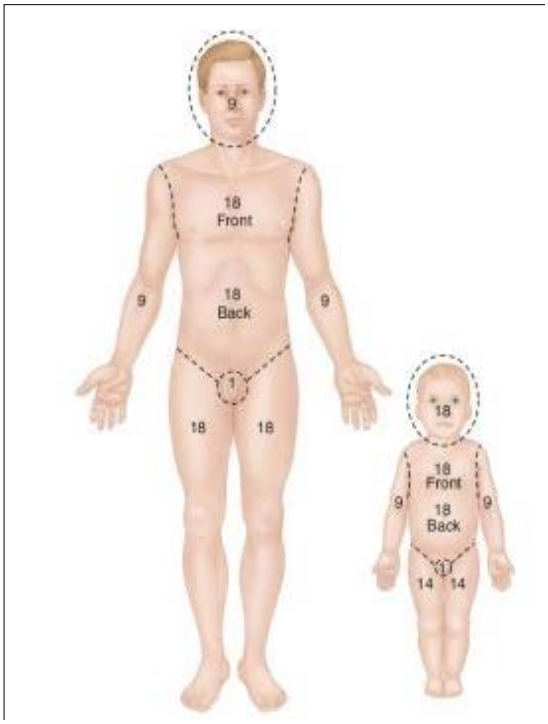
Burns – Pearls

- Pain Management: for 2nd and 3rd degree burns, for **ADULT** administer **MORPHINE SULFATE** in 2 – 5mg increments IVP, titrated to effect. Max dosage is **10mg**, subsequent **MORPHINE** requires Physician's Orders. For **PEDIATRIC** administer MORPHINE SULFATE in 0.1mg/kg increments IVP, may repeat X1 in 5-10 minutes. Max dosage is **5 mg**, subsequent MORPHINE requires Physician's Orders.
- Classify and evaluate the burn in three ways: source, degree, and severity.
    - Source: Never assume the agent or source of the burn.
    - Degree: Burns involving the skin are classified as superficial, partial thickness, and full thickness; or first, second, third degree.
- Evaluate depth of burn and estimate extent using Rule-of-nines:
    - Wear gloves and mask until wounds are covered.
    - Do NOT break blisters.
- Treatment:
    - Place sterile burn sheet on stretcher before moving patient to stretcher.
    - Cover burns with dry sterile dressings.
    - Cover patient with blanket to maintain body temperature.
    - Remove all distal jewelry.
- Parkland Formula: $\frac{4 \text{ ml x kg x \% of burn}}{2}$

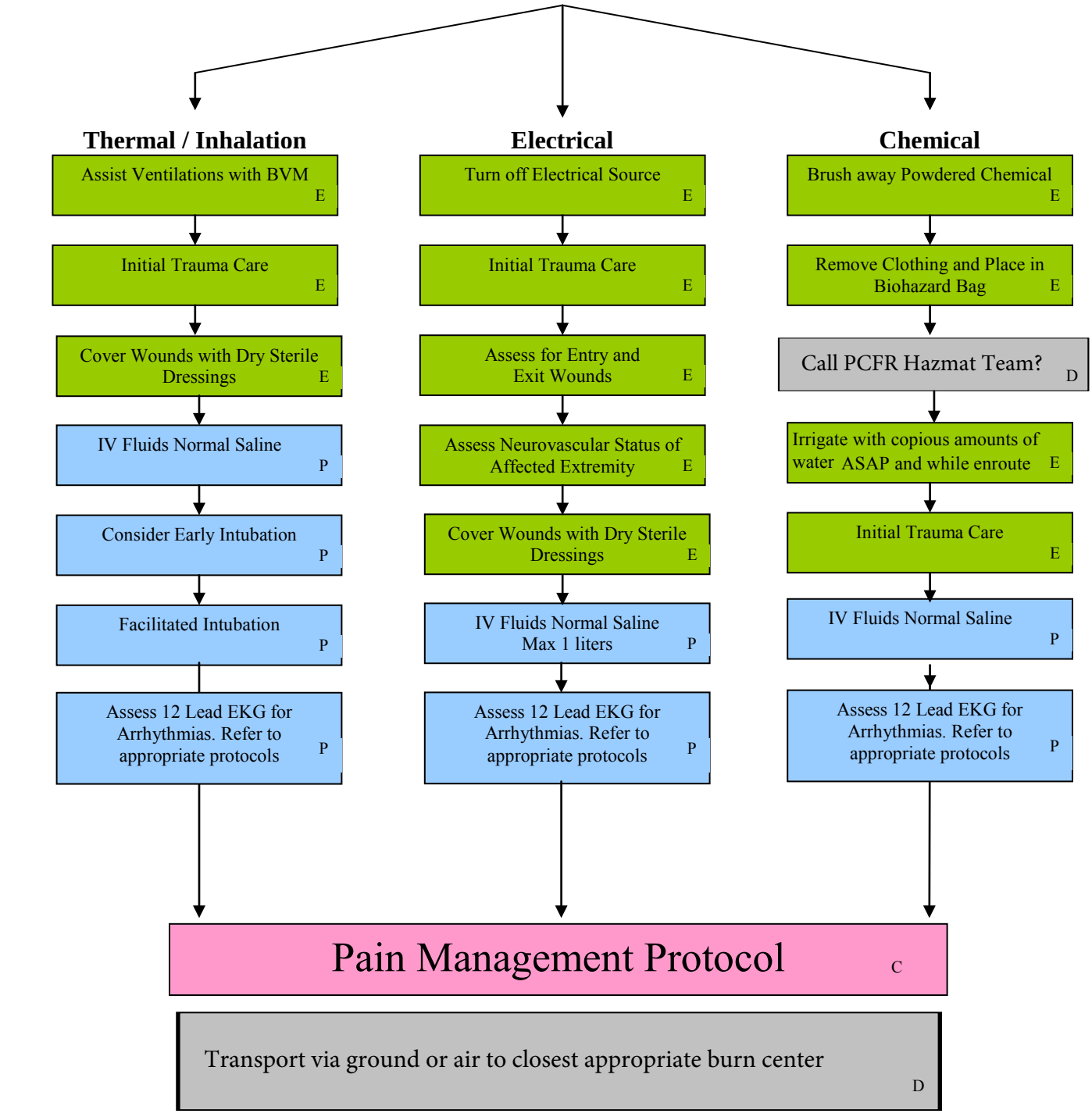


Lightning Injuries: (Electrical Burns) Signs and Symptoms

- Cardiorespiratory
    - Due to direct current
    - May resolve spontaneously as automaticity Resumes
- Respiratory Arrest
    - Due to paralysis of medullary center
    - May lead to hypoxic induced V. Fib
- Shock
    - Neurogenic (Spinal Injury)
    - Hypovolemic (trauma)
- Ruptured Tympanic Membrane
- Featherlike burns
- Corneal Lesions
- Hyphema (blood in anterior chamber of eye)
- Retinal detachment

Burns

Mechanism:	Signs and Symptoms	Differential:
• Trauma/Medical • Animal Bite • Insect Sting/Bite • Time of Contact • May Be Immediate or Delayed effects • Scene Safe	• Singed Nasal Hair, Eyebrows, Eyelashes • Wheezing/Stridor Present	• Assess Severity by Using the Rule of Nines • Wear Gloves and Mask until Wounds are Covered • DO NOT Break Blisters • Use Sterile Sheet • Remove Distal Jewelry



Chest Injuries

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Chest Injuries – Pearls

- Pericardial Tamponade Suspected – Assess for **Beck's Triad: (**Narrowing Pulse Pressures, JVD, Muffled Heart Sounds).
- Pneumothorax/Hemothorax suspected: Refer to Pleural Decompression.
- Reassess lung sounds often when the above are suspected.
- 12 Lead EKG should be obtained in serious/severe chest injuries.
- Observe for symmetrical chest rise.
- Do not over fluid resuscitate.
- DO NOT UTILIZE A FLUTTER VALVE

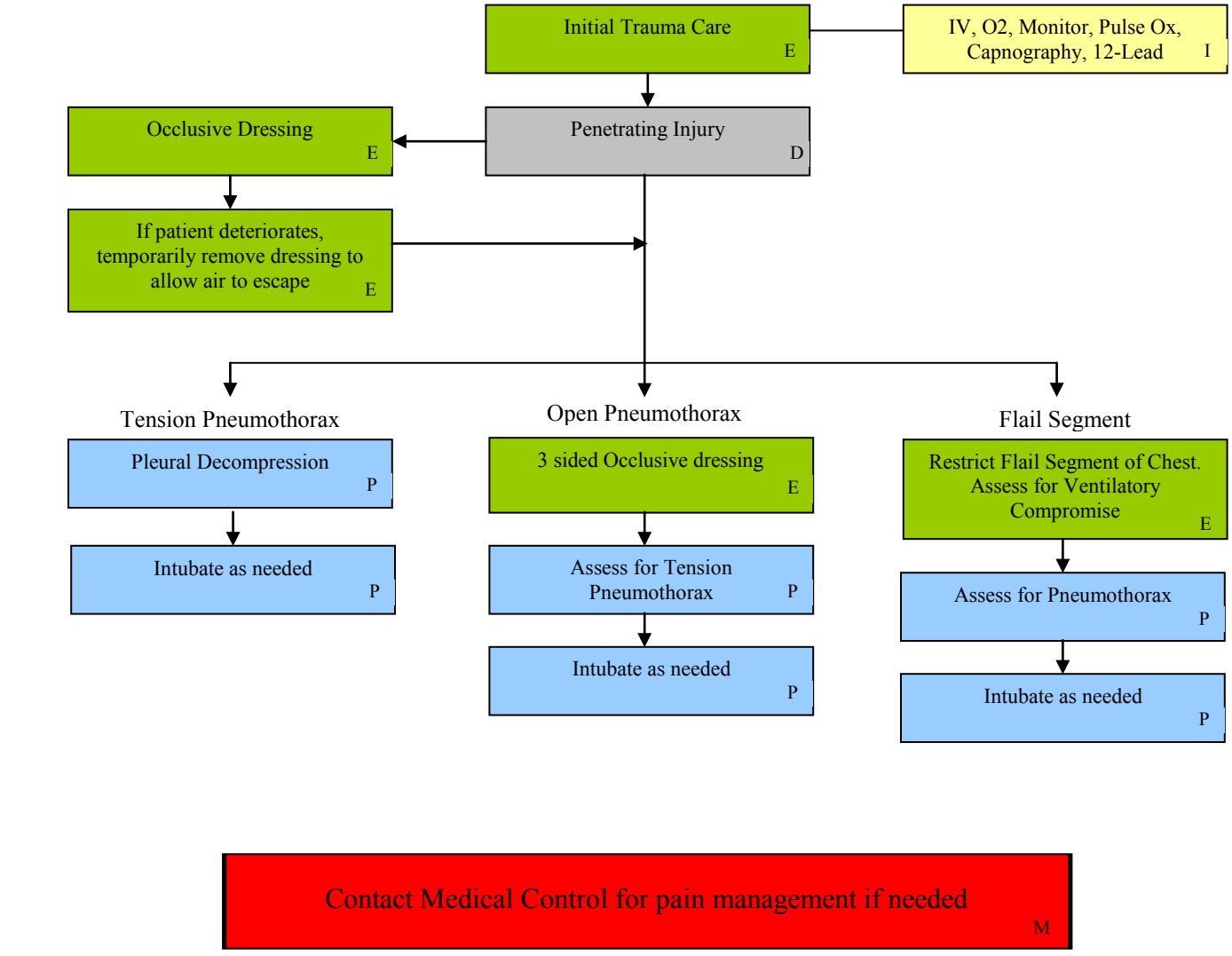
Injury	Trachea	Breath Sounds	Percussion
Tension Pneumothorax	Away from affected lung	Diminished or absent	Hyperresonant
Simple Pneumonthorax	Midline	May be diminished	Usually normal
Pulmonary Contusion	Midline	Normal/Crackels sometimes	Normal
Lung Collapse	Towards	May be reduced	Normal

SIGNS AND SYMPTOMS OF TENSION PNEUMOTHORAX

- Anxiety, agitation, and apprehension
- Diminished or absent breath sounds
- Dyspnea with cyanosis (lips,inside of mouth, fingertips, and/or nail beds)
- Rapid, shallow breathing (tachypnea)
- Distended neck veins (JVD)
- Hypotension - evidenced by a loss of radial pulse
- Cool, clammy skin
- Decreased level of consciousness (AVPU scale)
- Visible deterioration
- Loss of consciousness
- Tracheal deviation (a late sign, might not be observed)

Chest Injuries

History:	Signs and Symptoms	Differential:
• Assault • MVC • Fall • Blunt Trauma • Penetrating Injuries • Crush Injuries	• Hypotension • Severe Respiratory Distress • JVD • Diminished or absent lung sounds • Tracheal Deviation • Muffled Heart Tones	• Open Pneumothorax • Tension Pneumothorax • Pericardial Tamponade • Flail Segment



Contact Medical Control for pain management if needed M

Crush Syndrome

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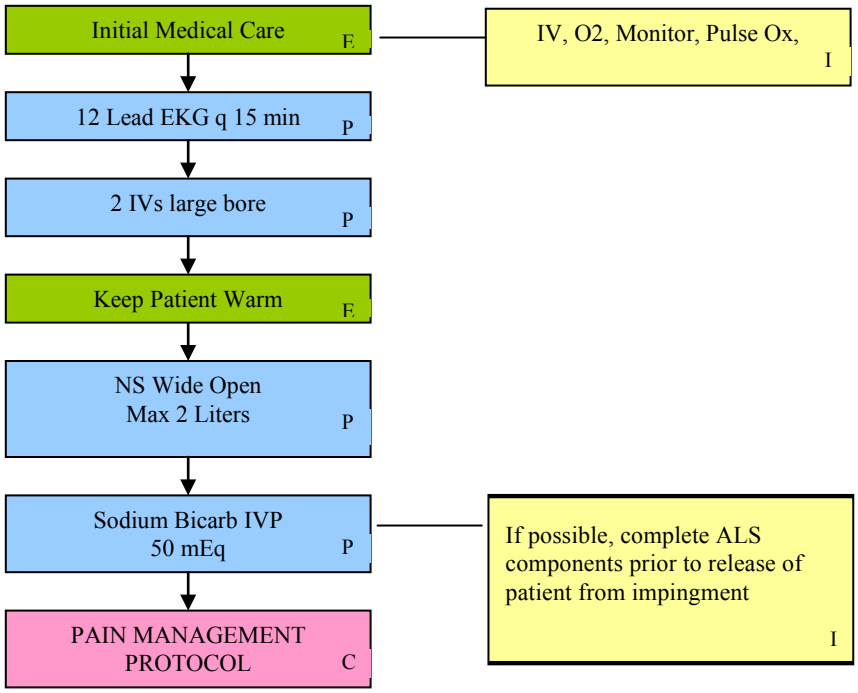
Crush Syndrome – Pearls

Indications for use of Crush Protocol: Any Extremity or Torso impingement injury > 1 hour

- Be aware of complications of Rhabdomyolysis
  - Muscle pain, Tenderness, Swelling – Compartment Syndrome
  - Hypovolemic state
  - Decreased urine output
  - Dark Urine
  - Peaked T-waves (possible hyperkalemia), hypocalcemia
- Cardiac arrest from crush injury due to prolong entrapment.

Crush Syndrome

History:	Signs and Symptoms	Differential:
• Age • Past medical history • Renal disease or insufficiency • Heart disease • Medications • Allergies • Dialysis patient	• Compression > 60 minutes • Large muscle mass involvement • Absent pulse & capillary refill • Pale, clammy, cool skin • Weak rapid pulse • Usual pain 0/10 • Shock	• Isolated arterial lesion • Isolated nerve damage • Cellulitis • Osteomyelitis • Tenosynovitis • Synovitis • Thrombophlebitis



Drowning / Near Drowning

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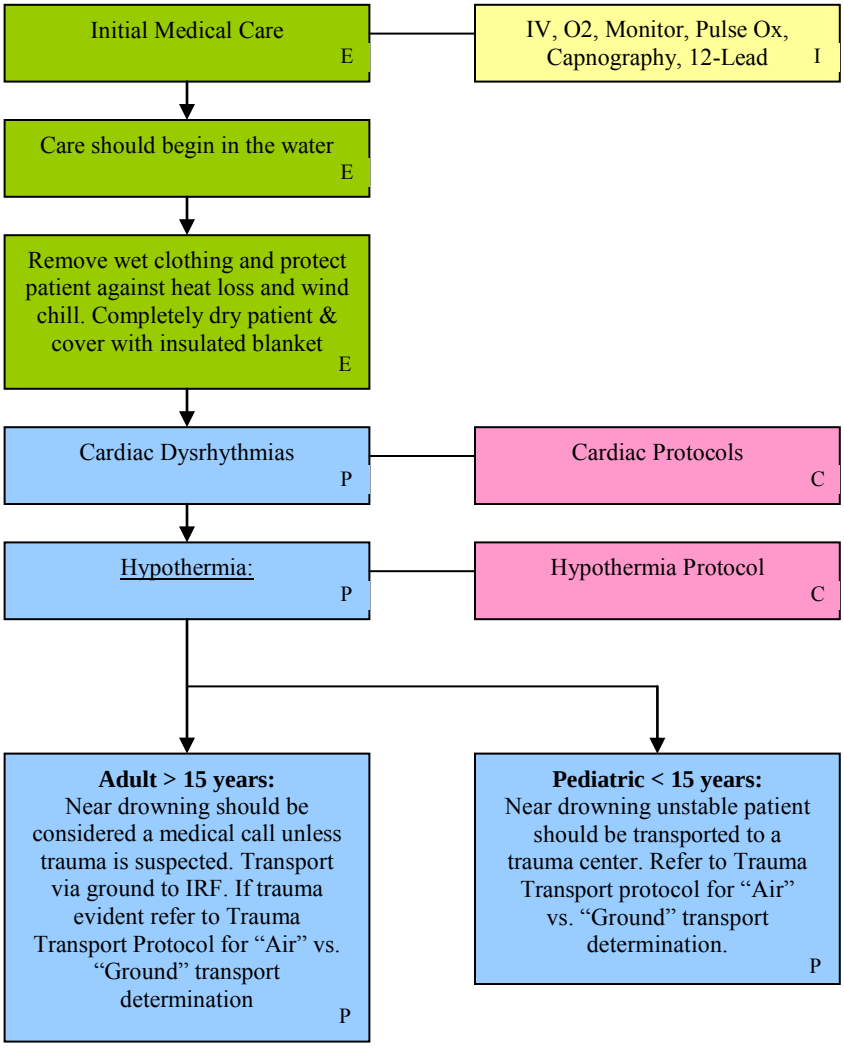
Drowning / Near Drowning – Pearls

- **Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, and Neurological.**
- With cold water no time limit - resuscitate all.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- **Drowning is a leading cause of death among would-be rescuers.**
- **Allow appropriately trained and certified rescuers to remove victims from areas of danger.**
- **With pressure injuries (decompression / barotrauma), consider transport or availability of a hyperbaric chamber:**
  - **Florida Hospital South ER, Orlando**
  - **Shands Hospital ER, Gainesville**
- **NEAR DROWNING is defined as a submersion event with a loss of pulse and/or respirations with an eventual ROSC**
- **DROWNING is defined as a submersion event with no ROSC and should be transported to an IRF.**
- **If a pediatric patient is involved in a submersion event and is deemed medically and clinically stable the patient may be transported to an IRF.**

Drowning / Near Drowning

History:	Signs and Symptoms	Differential:

• Submersion of water regardless of depth
• History of trauma i.e.: diving
• Duration of immersion
• Temperature of water
• Fresh / Salt water
	• Unresponsive
	• Mental status changes
	• Decreased or absent vital signs
	• Vomiting
	• Coughing
		• Trauma
		• Pre-existing medical condition
		• Pressure injury
		  • Barotrauma
		  • Decompression sickness



Dysbarism / Decompression Sickness

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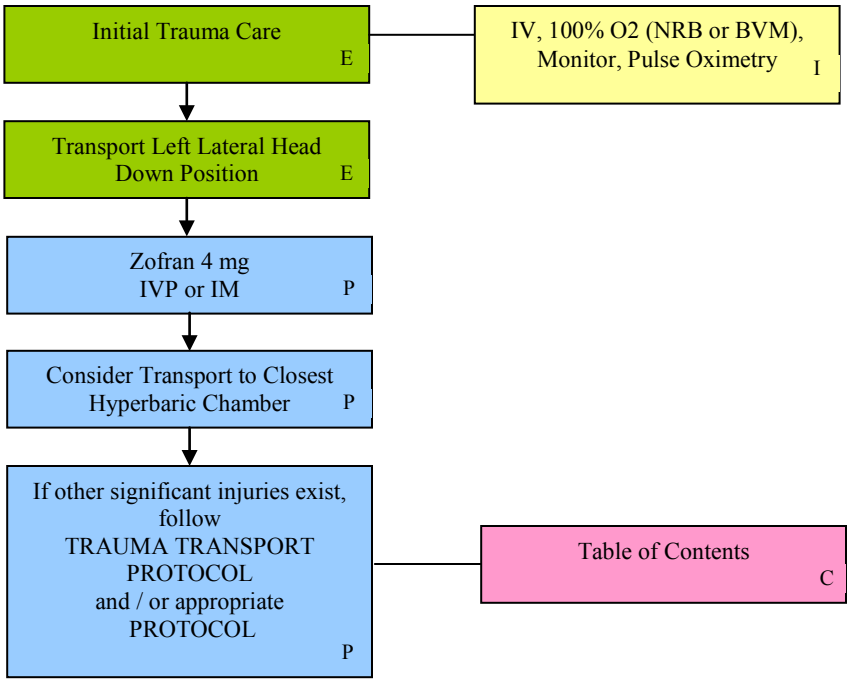
Dysbarism – Pearls

- If the patient is exhibiting altered mental status, the Paramedic should immediately coordinate with dispatch and Medical Control for possible transport arrangements to the closest **HYPERBARIC CHAMBER:**
    - **Florida Hospital South ED, Orlando.**
    - **Shands Hospital ED, Gainesville.**
- If the Patient is exhibiting Altered Mental Status, Immediately Coordinate with Dispatch and Medical Control for Transport to the Closest Hyperbaric Chamber:

Dysbarism & Decompression Sickness

History:	Signs and Symptoms	Differential:
• Onset Usually within 1-3 Hours after Scuba Diving	• Severe Throbbing Pain Involving Muscles, Joints, and Abdomen • Pruritus (itching) • Mottling • CNS and/or Respiratory Difficulties • N/V • Cough • Ear pain	• Air Embolism • Pulmonary Embolism • Pneumothorax • CVA • Auditory Barotrauma



Extremity Trauma

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Extremity Trauma – Pearls

- In amputations, time is critical. Transport to Trauma Center.
- Hip, knee, and elbow dislocations/fractures have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Severe bleeding not rapidly controlled may necessitate application of a tourniquet.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.

Transport Destination Determination for Traumatic Amputations

Patient to be ground transported to nearest receiving facility with reattachment capabilities (Tampa General in most cases) for the following situations:

Amputations that are proximal to the DIP (most distal joint on finger)of more than one (1) finger

Amputation of thumb
Amputation distal to the wrist on hand
Amputations distal to the ankle but proximal to the toes
Notify receiving facility as soon as possible
Do not discuss possibility or impossibility of reimplantation with patient from the time of injury.

Contraindications for transport to reattachment facility

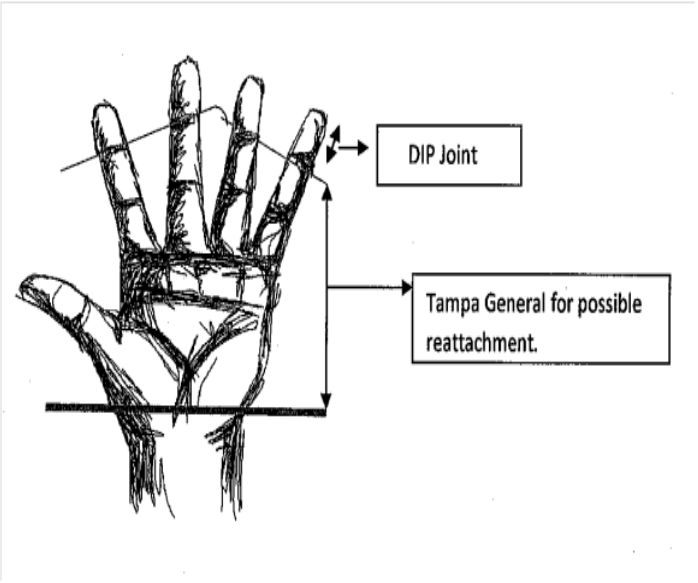
If patient meets State Trauma Alert Criteria

transport to closest Trauma Center.

Severely crushed or mangled parts
Amputations at multiple levels
Amputations in patients with other serious injury or disease

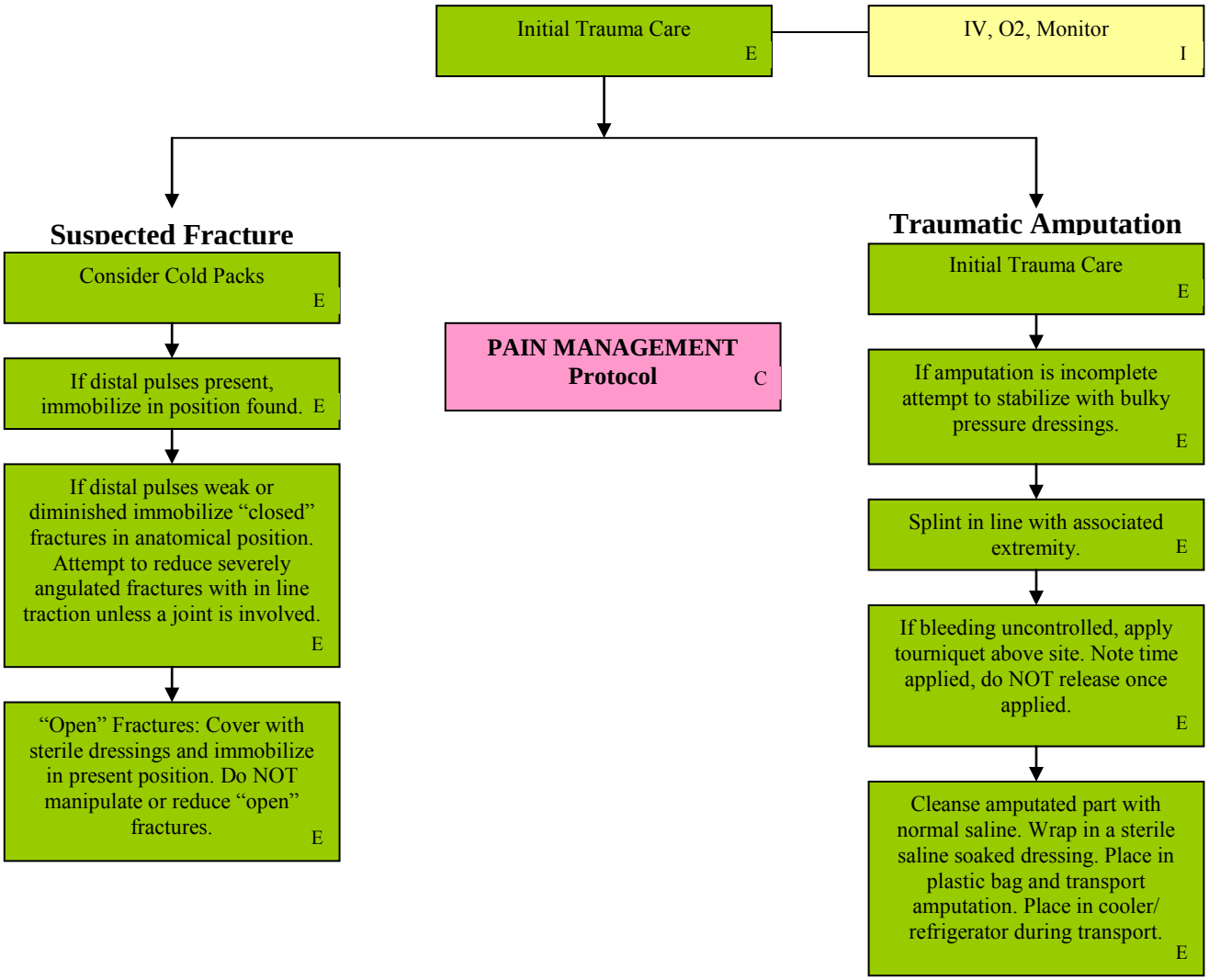
Amputation of single digit, excluding the thumb

Amputation of toes
Any amputation >six (6) hours



Extremity Trauma

History:	Signs and Symptoms	Differential:
• Type of injury • Mechanism: crush/penetrating/amputation • Time of injury • Open vs. closed • Wound contamination • Medical history • Medications	• Pain, swelling • Deformity • Altered sensorium / motor function • Diminished pulse / cap refill • Decreased extremity temperature	• Abrasion • Contusion • Laceration • Sprain • Dislocation • Fracture • Amputation



Head Injuries

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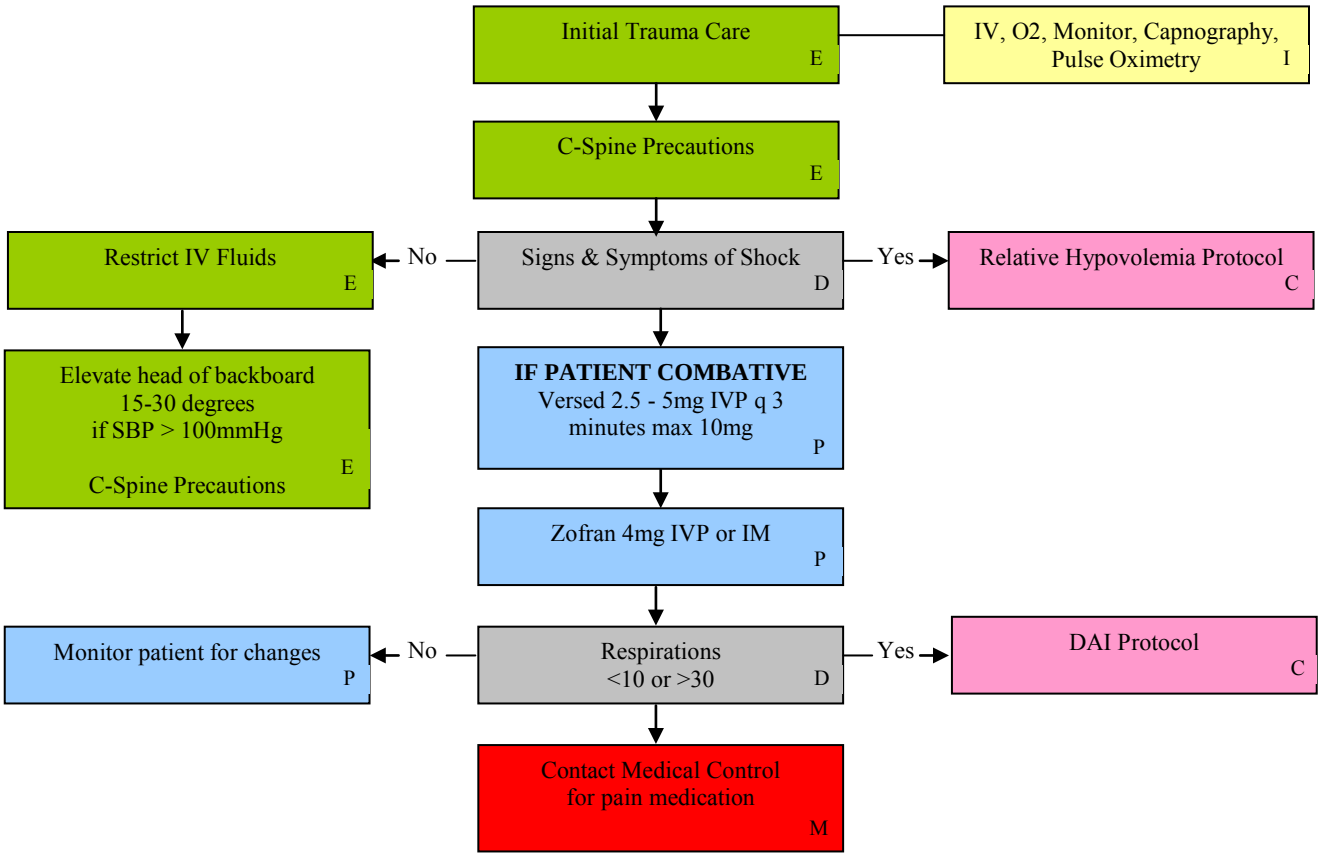
Head Injuries – Pearls

- In absence of capnography, mildly hyperventilate patient (adult: 20 breaths per minute, child: 30, infant: 35) only if ongoing evidence of brain herniation (blown pupil, decorticate or decerebrate posturing, or bradycardia).
- Increased intracranial pressure (ICP) may cause Cushing's Response (HTN, bradycardia, and Irregular respirations).
- Hypotension usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- The most important item to monitor and document is a change in the level of consciousness and GCS.
- Consider restraints if necessary for patient's and/or personnel's protection.
- Concussions are periods of confusion or loss of consciousness with trauma that may have resolved by the time EMS arrives. A physician should evaluate any prolonged confusion or mental status abnormality, which does not return to normal within 15 minutes or any documented loss of consciousness.
- DAI – Drug Assisted Intubation

	Infant < 1 yr	Child 1-4 yrs	Age 4-adult
	EYES		
4	Open	Open	Open
3	To voice	To voice	To voice
2	To Pain	To Pain	To Pain
1	No response	No response	No response
	VERBAL		
5	Coos babbles	Oriented, Speaks	Oriented and alert
4	Irritable	Confused	Disoriented
3	Cries persistently	Inappropriate words	Inappropriate words
2	Moans to pain	Incomprehensible words	Incomprehensible words
1	No response	No response	No response
	MOTOR		
6	Spontaneous movement	Spontaneous movement	Obeys commands
5	Localizes pain	Localizes pain	Localizes pain
4	Withdraws from pain	Withdraws from pain	Withdraws from pain
3	Decorticate flexion	Decorticate flexion	Decorticate flexion
2	Decerebrate extension	Decerebrate extension	Decerebrate extension
1	No response	No response	No response

Head Injuries

History:	Signs and Symptoms	Differential:
• Age • Medical history • Mechanism • LOC	• Altered Mental Status • Amnesia • Combative • Vomiting • Battle Signs • Raccoon Eyes	• Closed • Open • LeFort Fractures



REMINDER: Anticoagulants + Age >55 = Grey Trauma Criteria

Coumadin or Jantoven (warfarin), Pradaxa (dabigatran), Xarelto (rivaroxaban), Lovenox (enoxaparin), Eliquis (apixaban), Pletal (cilostazol), Arixtra (fondaparinux), Aggrastat (tirofiban hydrochloride), Agrylin (anagrelide), Fragmin (dalteparin) I

Opthalmic Emergencies

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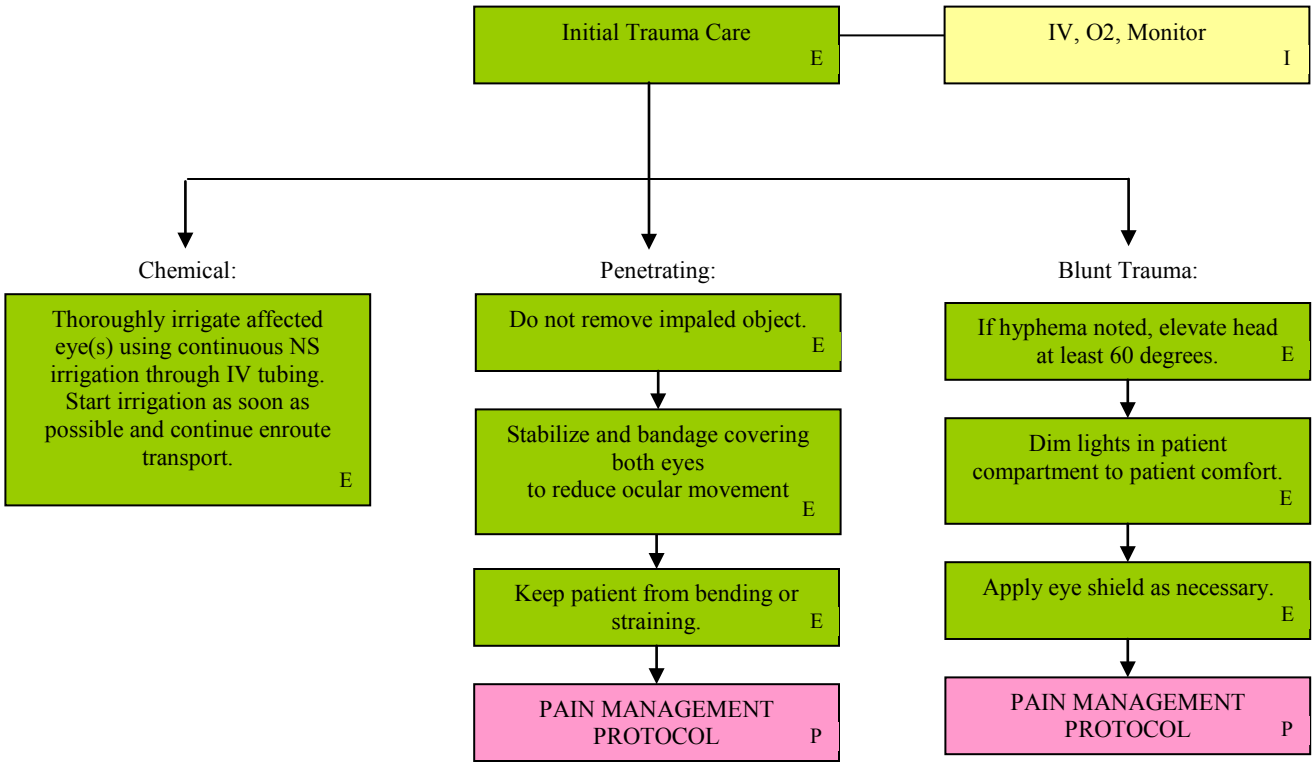
Opthalmic Emergencies – Pearls

- HYPHEMA – Blood in the anterior chamber of the eye.
- Amarosis Fugax – Visual disturbance of "Curtains Across the Eyes"
- Pseudotumor Cerebri – Increase CSF fluid in the brain causing headaches

Opthalmic Injuries

History:	Signs and Symptoms	Differential:
• Time of injury / onset • Blunt / penetrating / chemical • Open vs. closed injury • Involved chemicals/MSDS • Wound contamination • Medical history • Tetanus status • Normal vision acuity • Medications	• Pain, swelling, blood • Deformity, contusion • Visual deficit • Leaking aqueous/vitreous humor • Upwardly fixed eye • Shooting or streaking light • Visible contaminants • Rust ring • Lacrimation	• Abrasion / Laceration • Globe rupture • Retinal nerve damage • Chemical/thermal burn • Orbital fracture • Orbital compartment syndrome • Neurological event • Acute glaucoma • Retinal artery occlusion



Pain Management

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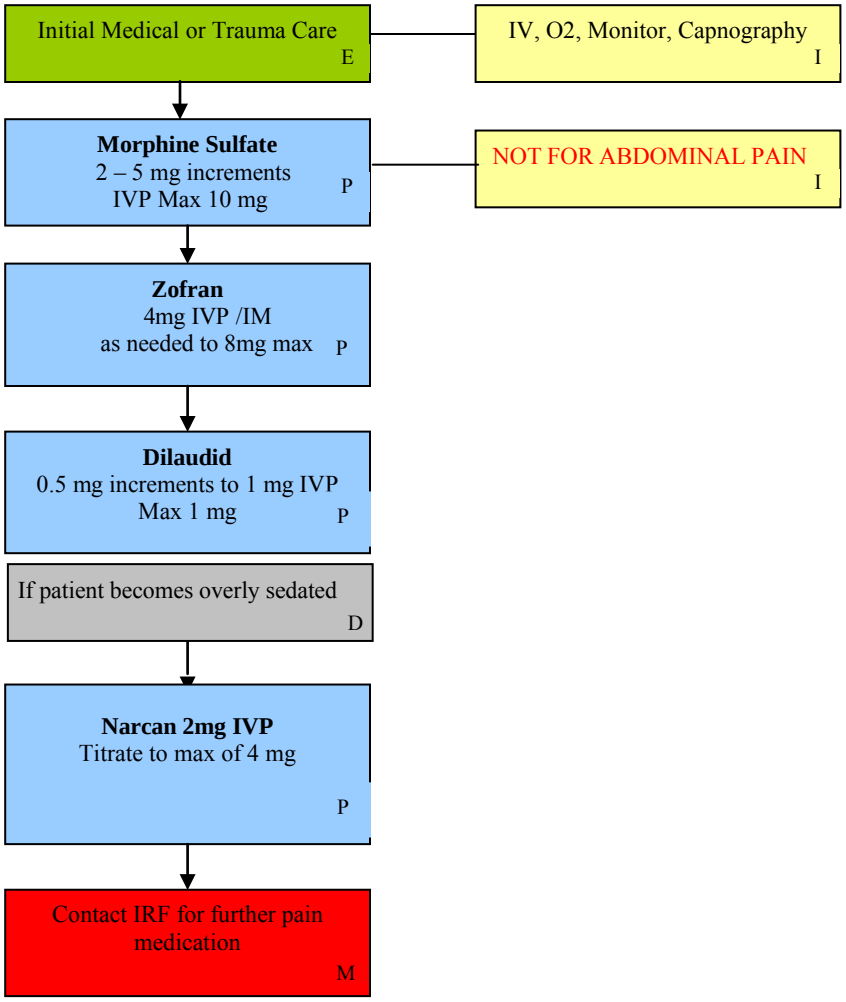
Pain Management – Pearls

- Be aware of patient mental status prior to administration of medication.
- Note patient capnography prior to medication administration and monitor closely for hypoventilation.
- **NARCAN** should be accessible if signs of over sedation:
  - Respiratory Depression
  - AMS
  - Unresponsive
  - Low Spo2 saturation
- **NO MORPHINE FOR ABDOMINAL PAIN INSTEAD USE DILAUDID**

Pain Management



Snake Bites

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Snake Bites – Pearls

- Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neurological exam if systemic effects are noted.
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake, copperhead, and water moccasin.
    1. Coral snake bites are rare: Very little pain but very toxic.

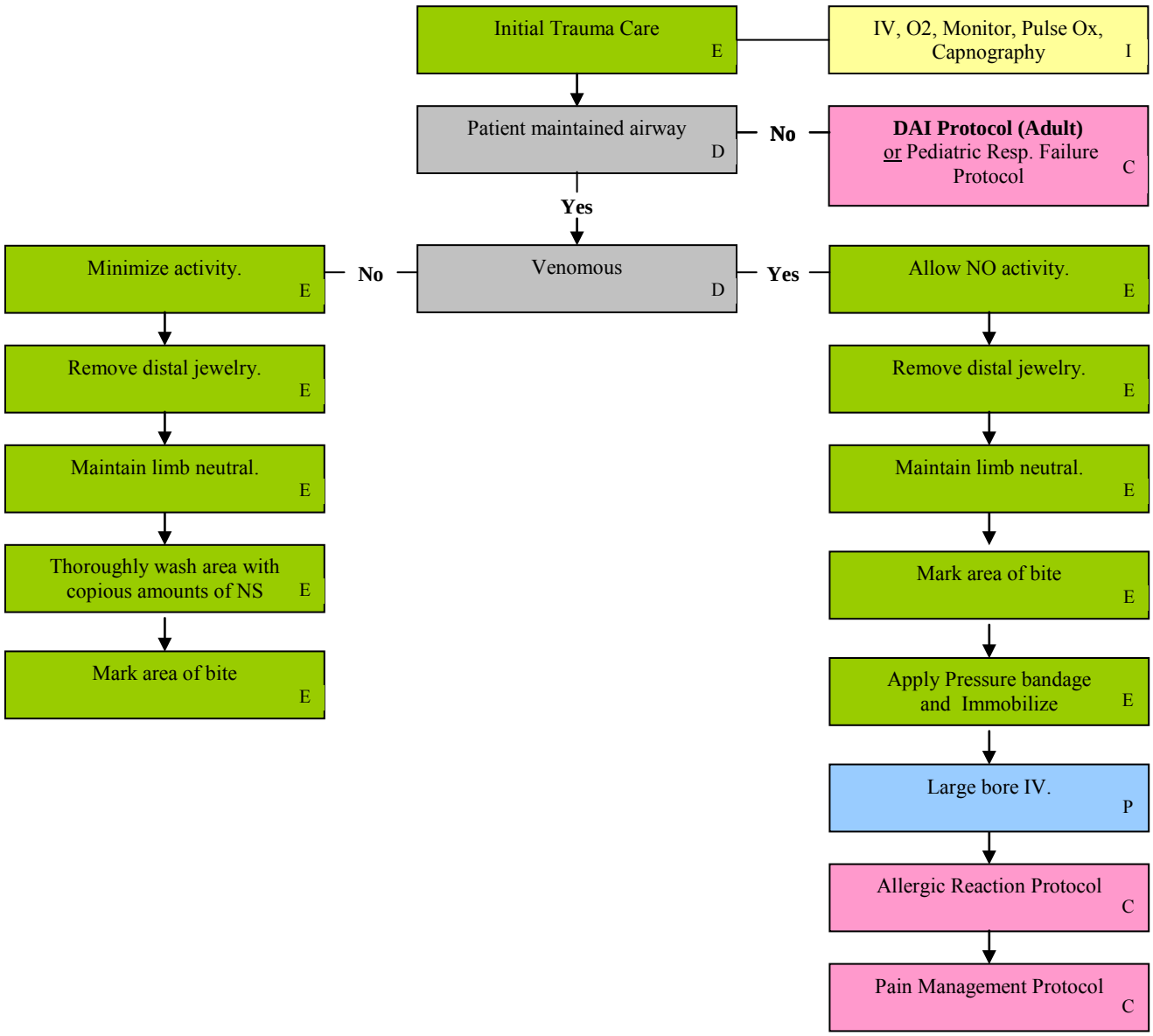
       "Red on yellow - kill a fellow, red on black - venom lack."
    2. Amount of envenomation is variable, generally worse with larger snakes and early in spring.
    3. If no pain or swelling, envenomation is unlikely.
    4. It is **NOT** necessary to take the snake to the ED with the patient.

- Evidence of infection: swelling, redness, drainage, fever, and red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplants patients.
- Do not apply ice or cold pack to snake bites or marine stings.
- **Crotaline: Includes all native pit vipers; rattlesnake, moccasin, copper head.**
- **Elapid: Includes coral snake and non-native cobras.**
- **Venom 1 Response Unit (ENVENOMATION EMERGENCY) 1-786-336-6600**
- **Don't cut the wound**
- **Don't use a tourniquet – concentrates venom to a certain area causing more damage**
- **Don't use ice – found to be a major factor leading to amputation**

Symptoms of Snakebite Envenomation	
Hemotoxic Symptoms	**Neurotoxic Symptoms**
Intense Pain	**Minimal Pain**
Edema	**Ptosis (drooping eyelid)**
Weakness	**Weakness**

Snake Bites

History:	Signs and Symptoms (Elapid)	Signs and Symptoms (Crotaline)	Differential:
• Description or photo of snake • Medication history • History of reactions • Past medical history • Time of bite • Prior first aid	• Respiratory distress/ depression • Hypersalivation • Cyanosis • Trismus • Altered mental status • Ptosis • Weakness • Muscle fasciculations • Hypotension • Tachycardia • Ophthalmoplegia • Dysphagia, dysphasia	• Pain at bite site • Swelling • Nausea, vomiting, diarrhea • Syncope • Vesicles • Local edema • Ecchymosis • Bullae • Bleeding • Tachycardia, hypotension	• Venomous vs. non-venomous • Severity of envenomation • Elapid vs. Crotaline • Coral snake vs. cobra



Spider Bites / Stings

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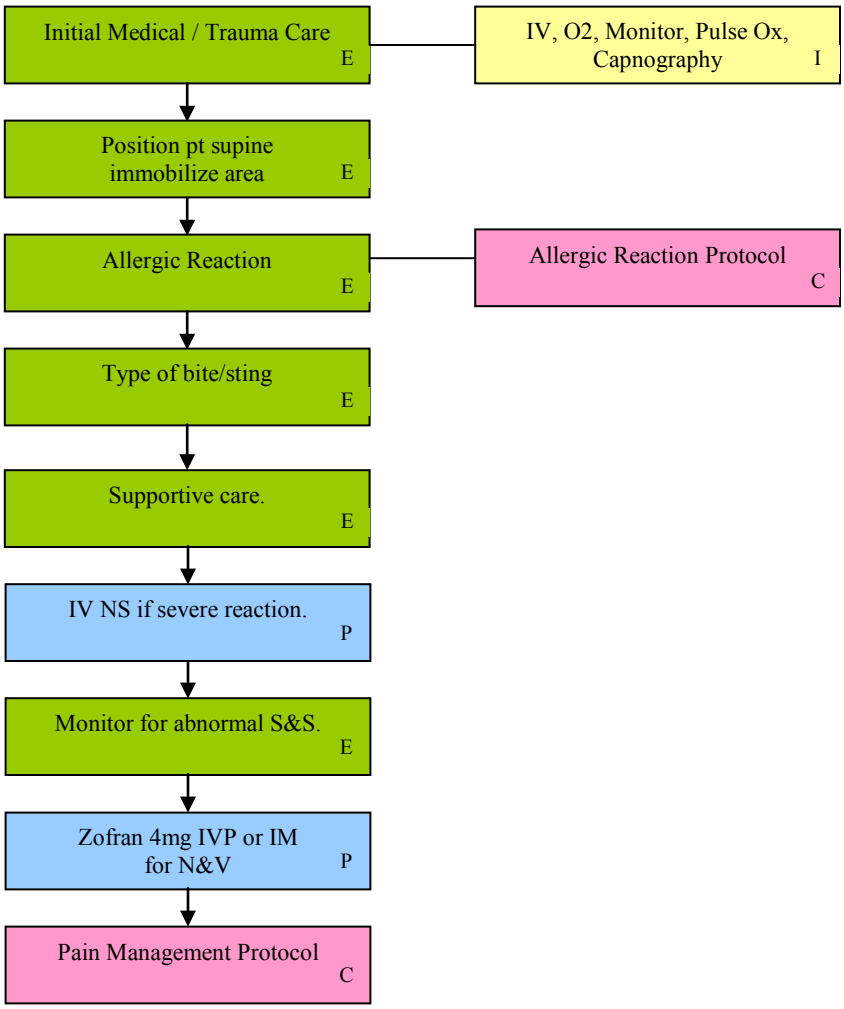
Spider Bites – Pearls

- Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neurological exam if systemic effects are noted.
- **Black Widow spider** bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hour glass on belly).
- **Brown Recluse spider** bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
- Evidence of infection: swelling, redness, drainage, fever, and red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplants patients.
- Do not apply ice or cold pack to snake bites or marine stings.
- It should be noted here that most "injuries" attributed to spiders are in fact not. They are generally an infection, MRSA being one of the prominent.
- **Tarantulas** discharge small hairs as a defense mechanism these hairs often lodge in the eye or nasal passages.
- **Venom Response Unit (ENVENOMATION EMERGENCY) 1-786-336-6600.**

Spider Bites

History:	Signs and Symptoms	Differential:
• Type of bite/sting • Description/photo of insect/animal/ snake • Time, location, size of insult • Previous reaction to like same • Domestic vs. wild/feral • Tetanus and rabies risk • Immuno-compromised patient • Does animal appear healthy • Prior first aid	• Erythema • Edema • Irritation • Severe pruritus • Mild pain • Muscle cramping • Nausea & vomiting • Headache, anxiety • Hypertension, tachycardia	• Animal bite • Human bite • Snake bite • Spider bite • Insect sting/bite • Marine sting/bite • Infection risk • Rabies risk • Tetanus risk • MRSA



Spinal Immobilization Rule Out

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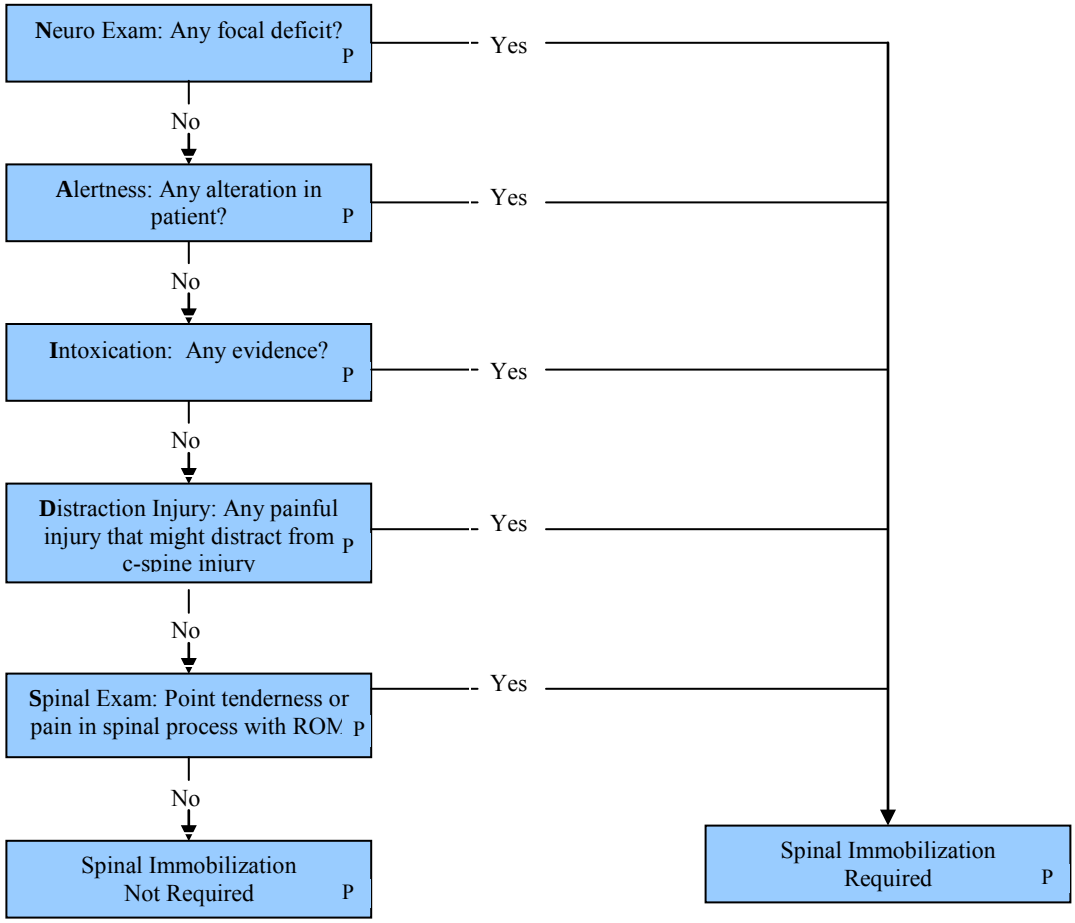
Spinal Immobilization Rule Out – Pearls

- **Consider immobilization in any patient with arthritis, cancer, or other underlying disease.**
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for spinal immobilization in the absence of symptoms.
- Assess patient for midline spinal tenderness, if pain/discomfort found, range of motion should NOT be assessed and patient should be fully c-spine immobilized.
- If no pain/discomfort, assess Range of Motion: the patient should touch their chin to their chest, extend their neck (look up), and turn their head from side to side (shoulder to shoulder) without spinal process pain.
- **Neurologic Exam**. Look for focal deficits such as tingling, reduced strength, or numbness in an extremity.
- **Alertness**. Is patient alert and oriented to person, place, time, and situation? Any change to alertness with this incident?
- **Intoxication**. Is their any indication that the person is intoxicated (impaired decision making ability)?
- **Distracting Injury**. Is there any other injury which is capable of producing significant pain in this patient?
- **Spinal Exam**. Look for point tenderness in any spinous process or spinal process tenderness with range of motion.
- **In the very old and very young patients, a normal exam may not be sufficient to rule out spinal injury.**
- **The decision NOT to implement spinal immobilization in a patient is the responsibility of the transporting Paramedic; however if full spinal immobilization has been applied prior to arrival it is not to be removed.**
- **Mechanisms of Injury:**
  - **Axial Loading (diving)**
  - **Blunt trauma**
  - **MVC or bicycle crash**
  - **Fall > 3 feet (children)**
  - **Adult fall from standing height**

Spinal Immobilization Rule Out



Taser Deployment

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Taser Deployment – Pearls

- **Any patient that has been tasered should be considered an ALS patient.**

- **Scene Safety Consideration:** Before touching any patient who has been subdued using a Taser ensure that Law Enforcement has disconnected the wires from the hand held unit.

  Assessment of a Patient that has been Tasered:

  1. Paramedic Assessment required, also documentation of the location of the probes on the patient's body is required on PCR and transport the patient to the closest Emergency Department:

  2. Confer with Law Enforcement and determine the patient's condition from the time of the Taser discharge until PCFR arrival.

  3. Determine from the patient:
     a. Date of Last Tetanus
     b. Any Cardiac History
     c. Any ingestion of a mind altering stimulant (Phencyclidine (PCP), Cocaine, etc.)

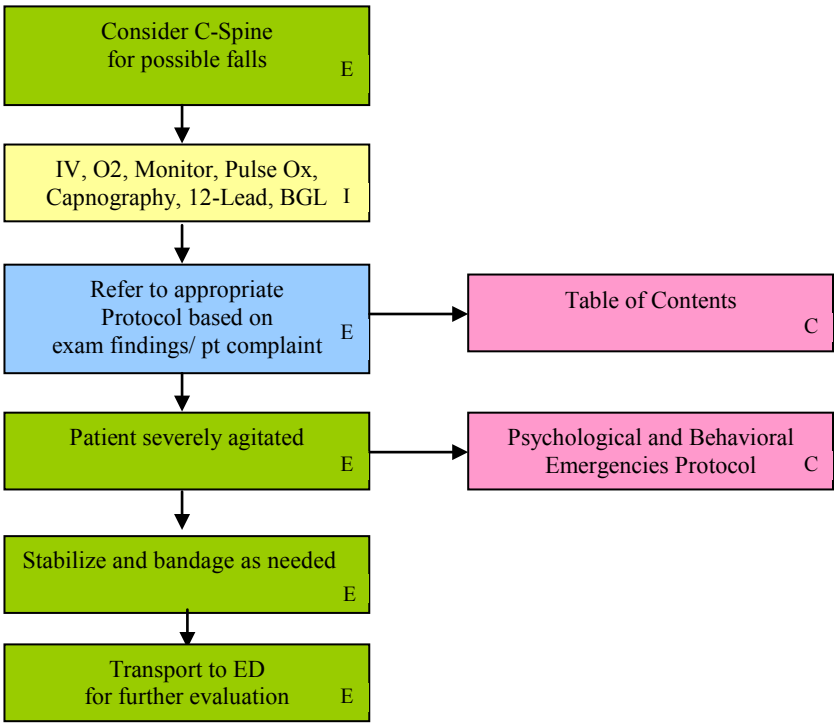
- **Transporting patients in prone position is contraindicated.**

  At a minimum Law Enforcement must follow transport unit to the closest appropriate psychiatric facility (Lakeland Regional Medical Center or Winter Haven Hospital)

- **Patients refusing transport should seek medical attention immediately or contact 911 if they experience any abnormal signs or symptoms.**

Taser Deployment

History:	Signs and Symptoms	Differential:
• Substance Abuse / Drug Overdose • Agitated • Alcohol abuse • Psychiatric Illness • Diabetes • Cardiac Disease • Situational Crisis • Injury to Self or others • Traumatic Injury	• Probes embedded • Anxiety, Agitation, Confusion • Combative / Violent • Cardiac Arrythmia	



Cold Emergencies

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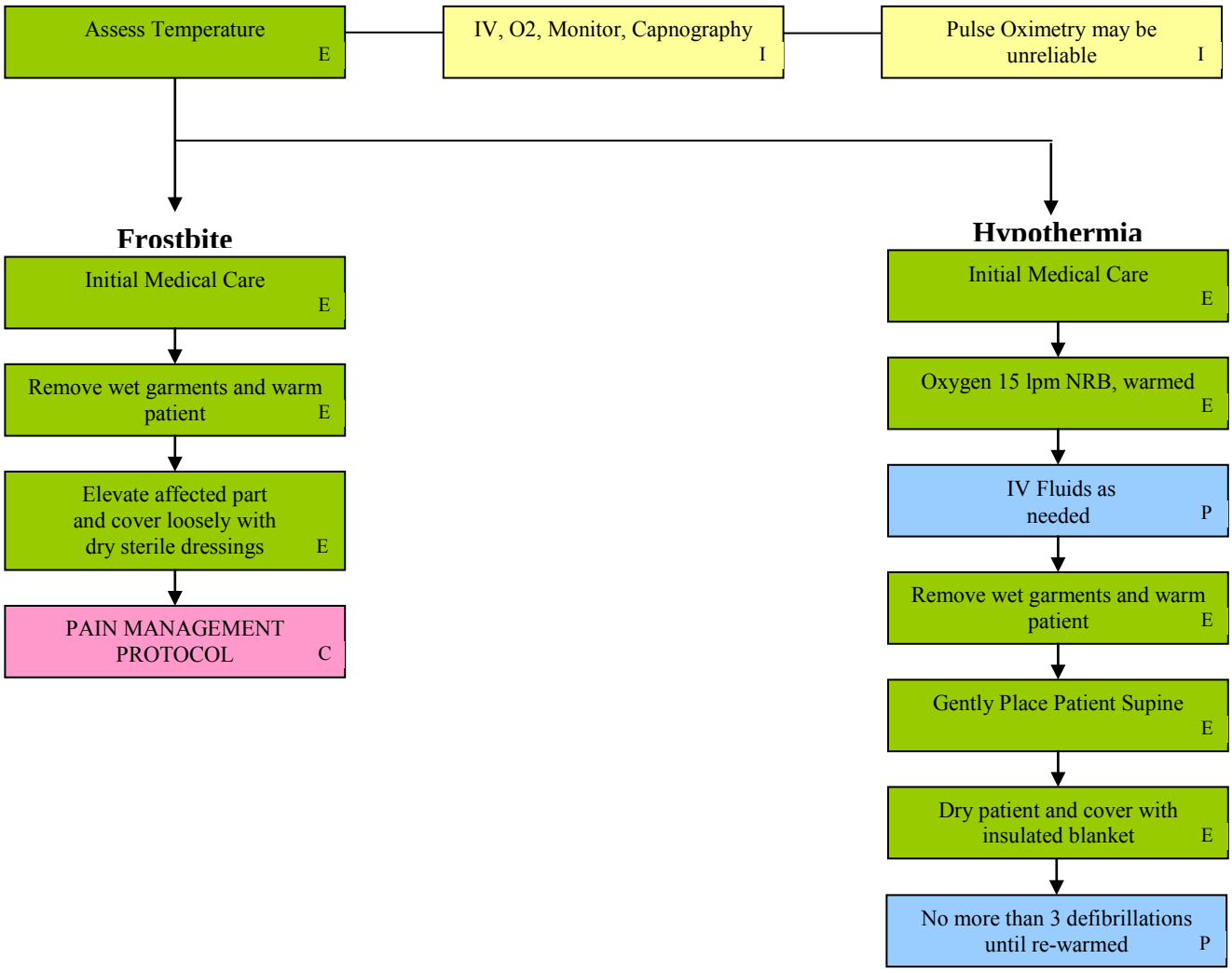
Cold Emergencies – Pearls

- Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, and Neurological.
- NO PATIENT IS DEAD UNTIL WARM AND DEAD.
- Hypothermia is defined as core temperature < 36° C (95° F).
- Extremes of age are more susceptible (i.e. young and old).
- With temperature less than 31° C (88° F) ventricular fibrillation is common cause of death.
- Handling patients gently may prevent this (rarely responds to defibrillation).
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia.
- Shivering stops below 32° C (90° F).

- PASSIVE REWARMING ONLY

Environmental Cold Emergencies

History:	Signs and Symptoms	Differential:
• Medical History • Medications • Exposure to environment even in normal temperatures • Exposure to extreme cold • Extremes of age • Drug or alcohol use • Infection or sepsis • Length of exposure/wet	• Cold • Clammy • Shivering • Altered mental status • Extremity pain • Sensory abnormality • Bradycardia • Hypotension • Shock	• Sepsis • Environmental • Hypoglycemia • Stroke • Head injury • Spinal cord injury



Hazardous Materials

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Hazardous Materials – Pearls

Haz mat contaminated patients are not only caused by accident. They can often be caused by self intention (Ingestion, Inhalation, and Injection)

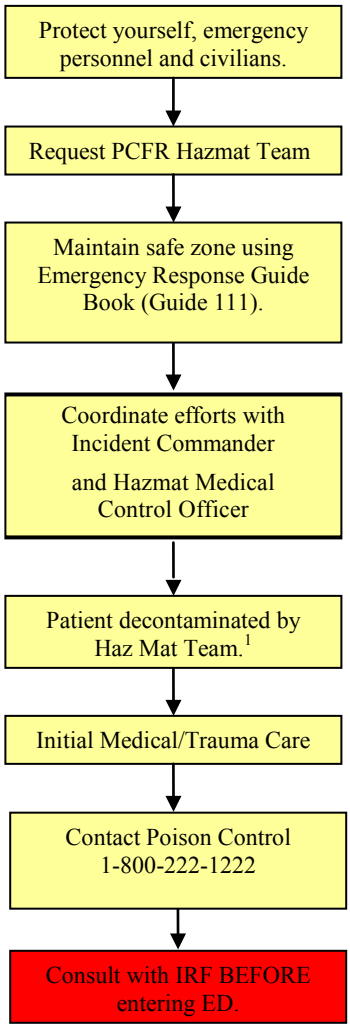
Recognition is the key.

The primary risk of secondary exposure for pre hospital provides is inhalation.

- Appropriate protective clothing and respiratory protection should be worn by transport crew members (PAPR, SCBA).
- Determination of the appropriate level of BSI should be done in conjunction with the Incident Commander.
- The decision to transport patients from a hazmat incident is ultimately under the control of the incident commander, but usually delegated to the haz mat medical control officer.
- In general, no victim with skin decontamination should be transported from the haz mat scene without being properly decontaminated.
- Patient should be wrapped in a blanket and outer plastic sheet to prevent contamination. An alternative would be to utilize a dedicated hazardous materials transport unit.
- Maintain maximum patient compartment ventilation.

Hazardous Materials

History:	Signs and Symptoms	Differential:
• Ingestion or suspected ingestion of potentially toxic substance • Substance ingested, route, qty. • Time of ingestion • Reason (suicidal, accidental) • Available meds in home • Medical history • Medications	• Mental status changes • Hypotension • Hypertension • Bradypnea • Tachycardia • Dysrhythmias • Seizures	• TCA • Tylenol • Depressants • Stimulants • Anticholinergic • Cardiac meds • Solvents, Alcohols, Cleaning agents • Insecticides



Heat Emergencies

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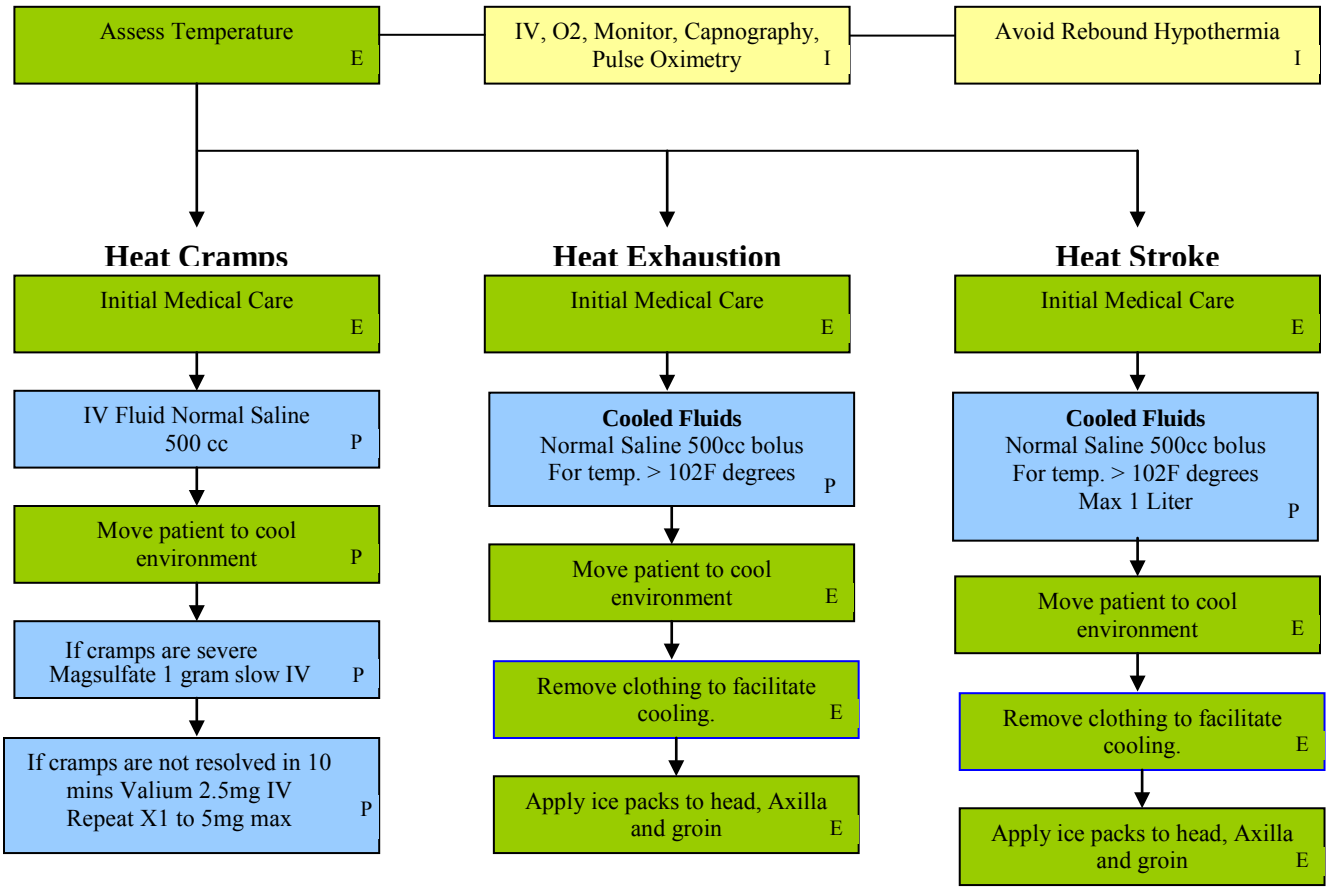
Heat Emergencies – Pearls

- All patients should have temperature assessed.
- Avoid rebound hypothermia with rapid cooling- shivering is too far!
- Extremes of age are more prone to heat emergencies (i.e. young and old).
- Predisposed by use of tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Sweating generally disappears as body temperature rises above 104 degrees F (40 degrees C).
- **Heat Cramps** consist of benign muscle cramping secondary to dehydration and are not associated with an elevated temperature.
- **Heat Exhaustion** consists of dehydration, salt depletion, dizziness, fever, weakness, AMS, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of dehydration, tachycardia, hypotension, temperature > 102 degrees F (39 degrees C), and an altered mental status.

Environmental Heat Emergencies

History:	Signs and Symptoms	Differential:
• Age • Exposure to increased temperatures and/or humidity • Medical history/medications • Extreme exertion • Length of exposure • Poor PO intake • Fatigue and/or muscle cramps	• AMS • Hot, dry, or sweaty skin • Hypotension • Shock • Seizures • Nausea	• Fever • Dehydration • Medications • Hyperthyroidism • DT's • Heat cramps • Heat exhaustion • Heat stroke • CNS lesions / tumor



Chemical Agent Exposure

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Organophosphate Poisoning – Pearls

Consult the Emergency Response Guide (ERG)

- **Mnemonic: SLUDGE**
  - **S**alivation
  - **L**acrimation
  - **U**rination
  - **D**iaphoresis
  - **G**astrointestinal Motility
  - **E**mesis

Mnemonic: RAIN
- **R**ecognize **– characteristics of the agent**
- **A**void – the hazardous agent
- **I**solate – the hazards of the agent
- **N**otify – the appropriate resources

Mnemonic: DUMBELS:
Diarrhea
Urination
Miosis
Bronchospasms
Bronchorrhea
Bradycardia
Emesis
Lacrimation
Salivations
Secretions
Sweating

- **Mild Symptoms of Organophosphate Poisoning**
  - Blurred vision, miosis (excessive constriction of the pupils)
  - Excessive, unexplained teary eyes
  - Excessive, unexplained runny nose
  - Increased salivation, such as sudden drooling
  - Chest tightness or difficulty breathing
  - Tremors throughout the body or muscular twitching
  - Nausea and/or vomiting
  - Unexplained wheezing, coughing, or increased airway secretions
  - Acute onset of stomach cramps
  - Tachycardia or bradycardia (abnormally fast or slow heartbeat)
- **Severe Symptoms Organophosphate Poisoning**
  - Strange or confused behavior
  - Severe difficulty breathing or copious secretions from lungs/airway
  - Severe muscular twitching and general weakness
  - Involuntary urination and defecation
  - Convulsions
  - Loss of consciousness
  - Respiratory arrest (possibly leading to death)

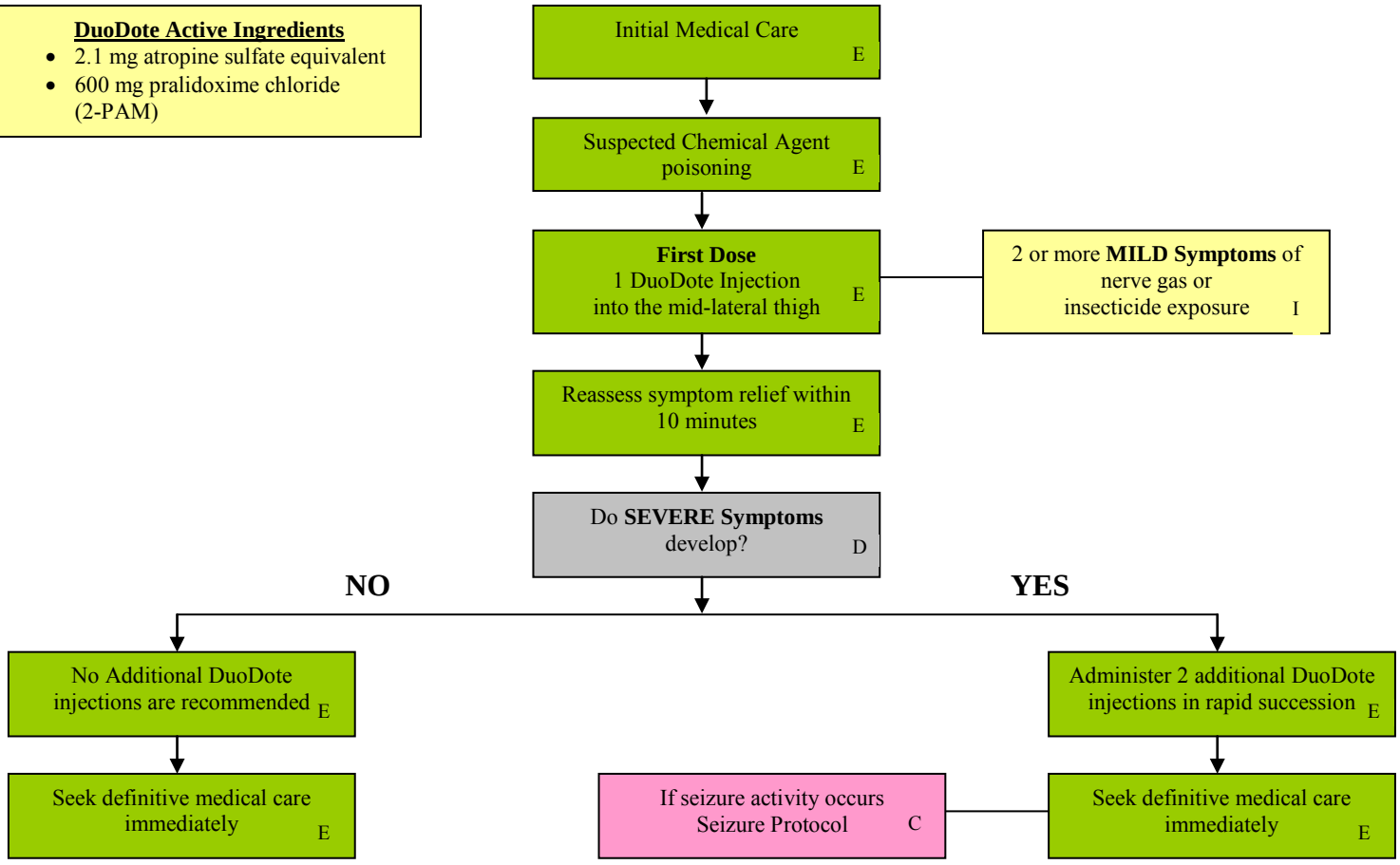
No more than 3 doses of DuoDote will be administered

Chemical Agent Exposure

History:	Signs and Symptoms	Differential:
• Age • Exposure to increased temperatures and/or humidity • Medical history/medications • Extreme exertion • Length of exposure • Poor PO intake • Fatigue and/or muscle cramps	• Blurred vision • Miosis (constricted pupils) • SLUDGE • Chest tightness • Tremors • N/V • Wheezing • Stomach cramps • Tachycardia or Bradycardia • Altered Mental Status • Respiratory Arrest • Death	• Fever • Dehydration • Medications • Hyperthyroidism • DT's • Heat cramps • Heat exhaustion • Heat stroke • CNS lesions / tumor

DuoDote

DuoDote Active Ingredients
- 2.1 mg atropine sulfate equivalent
- 600 mg pralidoxime chloride (2-PAM)



For patients experiencing **SEVERE** Symptoms instantly, immediately administer 3 DuoDote injections into the patient's mid-lateral thigh in rapid succession. Immediately seek definitive medical care I

Scene Rehabilitation

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Scene Rehabilitation - Pearls

Responders who meet any of the following will report to the Rehabilitation Unit Leader:

- Depletion of 30-minute or greater SCBA cylinder
- After 20 minutes of intense work without SCBA
- Whenever encapsulating chemical protective clothing is worn

Revitalization area includes:

- 10-min. Rehab if:
  - Depletion of 30-minute SCBA cylinder
  - After 20 minutes of intense work without SCBA
  - If members enter the rehab area prior to going through two 30-minute SCBA cylinders
- 20-min. Rehab if:
  - Depletion of two 30-minute SCBA cylinders
  - Depletion of one 45- or 60-minute SCBA cylinder
  - Whenever encapsulating chemical protective clothing is worn
  - After 40 minutes of intense work without SCBA
- Revitalization provides rest, rehydration (2-4 oz./20-min. work), nourishment, repeat medical evaluation:
  - Drinks should be cool (50-60 °F)

Treatment area includes:

- Personnel cared for until:
  1. Heart rate: $\leq$ 85% age specific maximum
  2. Temperature: $\leq$ 102º F tympanic OR temporal scanner
  3. Systolic Blood Pressure: < 185 mmHg
  4. Respirations: $\geq$ 10 or $\leq$ 30
  5. Pulse oximetry: > 90%
  6. Fatigue abates and skin color within normal limits

Personnel that require ALS treatment, such as the establishment of an IV in the rehab area, may not require transport

- Up to 2 L of cool Ringers Lactate can be administered

If after administration of 2 L of RL, vital signs do not return to baseline, personnel will be transported for medical follow up:

- All unstable personnel will be immediately transported
- All personnel who are unable to return to normal vital signs within 30-minutes will be transported for continual care

Scene Rehabilitation

Carbon Monoxide Protocol C

Encourage removal of all PPE including turnout gear
- Rest
- Active/passive cooling
- Oral rehydration

E

Check Vitals E

Abnormal Vital Signs
- **Pulse:** > 85 % maximum for age.
- **Temperature:** > 102 degrees F
- **Blood Pressure:** SBP ≥ 185
- **Respirations:** < 10 or > 30 per minute.
- **Absence of Injury or Distress**

E

Normal Vitals: Revitalization Area

Mandatory Rest
- Rest 10 minutes
- 12 oz./20 minutes of work

E

Reassessment and Monitor
- HR
- Temp
- SBP
- RR
- SpO2

q 10min.

E

Return to Full Duty E

Abnormal Vitals: Treatment Area

Mandatory Rest
- Rest 10 minutes
- 12 oz./20 minutes of work

E

Reassessment and Monitor
- HR
- Temp
- SBP
- RR
- SpO2
- EKG
- SpO2
- 12 Lead
- CO
- Ortho BP
- BGL

E

Transport if no improvement in total rehab time of 30 minutes E

Age-Predicted 85% Maximum Heart Rate

Age	85 Percent
20 – 25	170
25 – 30	165
30 – 35	160
35 – 40	155
40 – 45	152
45 – 50	148
50 – 55	140
55 – 60	136
60 – 65	132

Childbirth Complications

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Childbirth Complications – Pearls

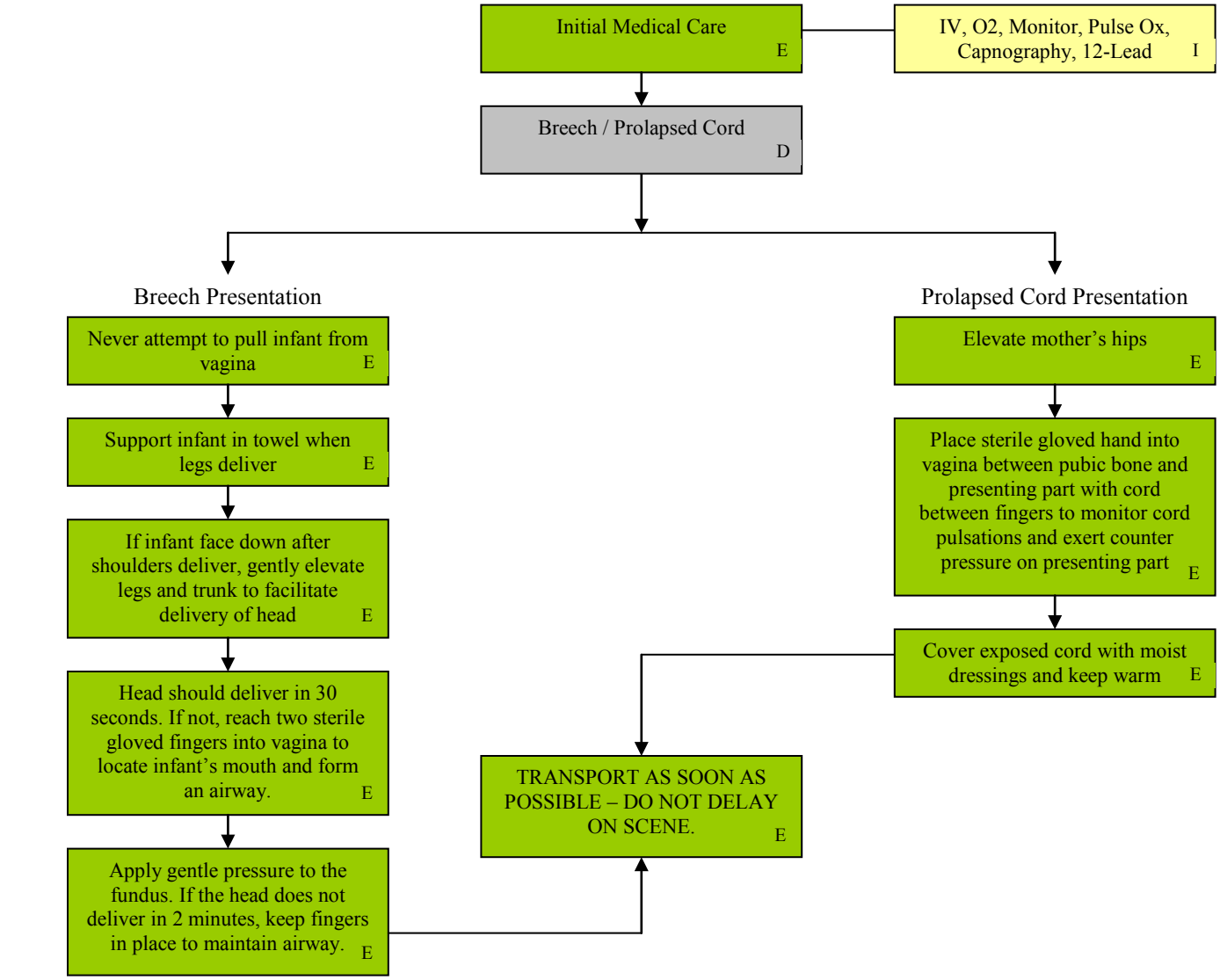
- Exam: Mental Status, Abdomen, Heart, Lungs, Extremities, and Neurological.
- **Gravida**: The total number of times a woman has been pregnant, regardless if the pregnancies were carried to term. A current pregnancy is included in this count.
- **Para**: The number of viable (> 20 weeks) births.
- Be aware with multi-gravida patients, if they indicate the baby is coming, the crew should prepare for delivery.
- Ask approximate age of gestation, LMP, Estimated Date of Confinement (EDC).
- History of C-Section.
- History of High Risk birth (i.e. Gestational Diabetes, Pre-eclampsia, Eclampsia, PIH, etc.).
- PIH: Pregnancy Induced Hypertension

OB Receiving Facilities

Hospital Name:	Address:	City:
Bayfront Medical Center	701 6th St S.	St. Petersburg
Brandon Regional Medical Center	119 Oakfield Dr.	Brandon
Celebration	400 Celebration Pl.	Celebration
Heart of Florida Regional Medical Ctr	40100 US Highway 27	Davenport
Florida Hospital Heartland	4200 Sun n Lake Blvd	Sebring
Florida Hospital Kissimmee	2450 N. Orange Blossom Trail	Kissimmee
Lakeland Regional Medical Center	1324 Lakeland Hills Blvd.	Lakeland
Osceola Regional Medical Center	700 West Oak Street	Kissimmee
South Florida Baptist Hospital	301 N Alexander St	Plant City
Winter Haven Hospital (Regency)	200 Ave F NE (101 Ave O SE)	Winter Haven

Childbirth Complications

History:	Signs and Symptoms	Differential:
• Due date • LMP • High risk • Previous births • Miscarriages / abortions • Vaginal/cesarean birth • Breech • Water broke / when/ color • Is there adequate time to transport	• Amniotic fluid • Bulging perineum • Crowning • Involuntary pushing • Contractions 2 minutes apart or less	• Imminent birth • Breech presentation • Prolapsed cord • Limb presentation • Multiple birth • Placenta previa • Abruptio placenta • Meconium Staining



Childbirth Emergency

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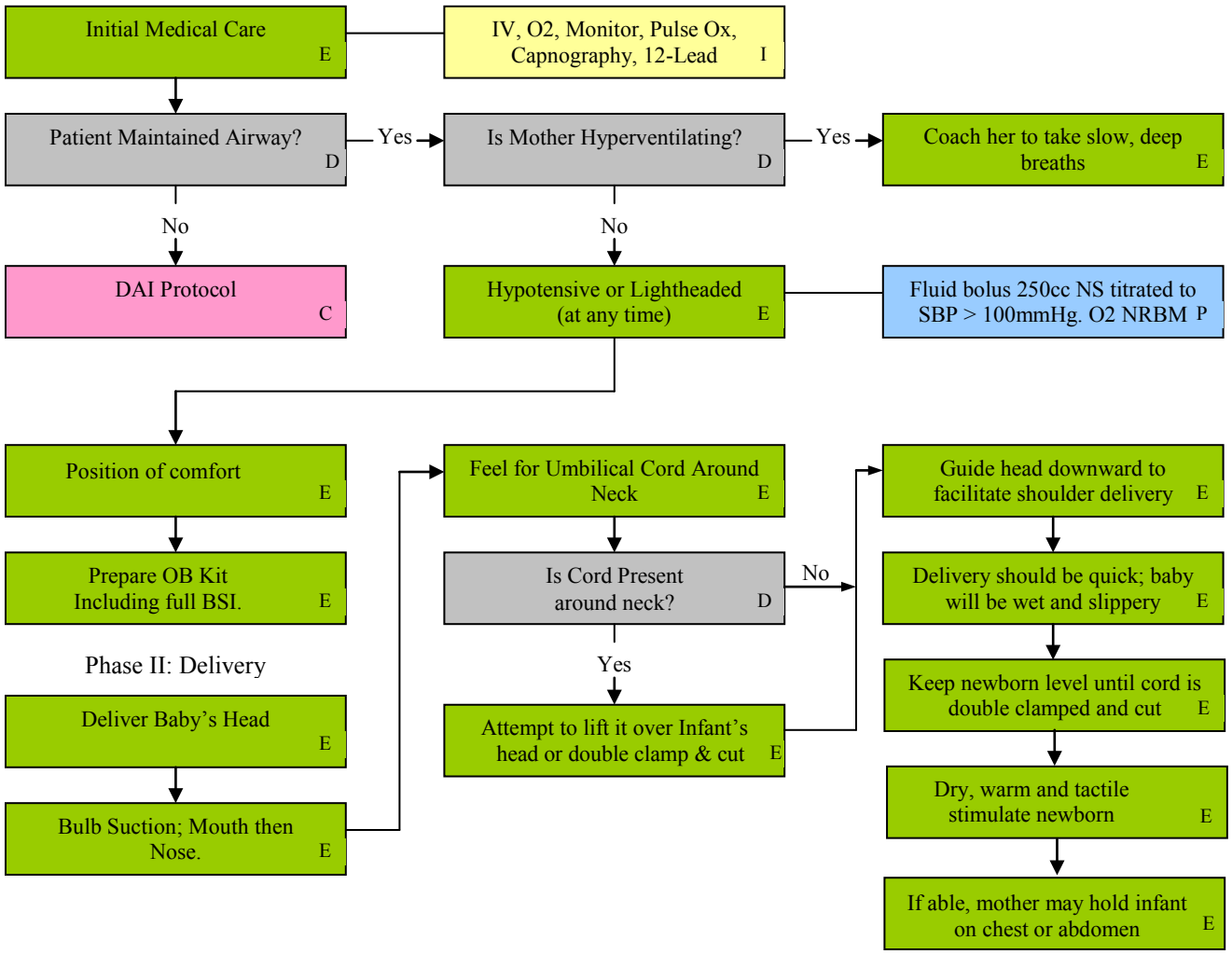
Childbirth Emergency – Pearls

- Exam: Mental Status, Abdomen, Heart, Lungs, Extremities, and Neurological.
- Severe headache, vision changes, or RUQ, pain may indicate pre-eclampsia.
- In the setting of pregnancy, hypertension is defined as a SBP greater than 140 or DBP greater than 90, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Maintain patient in a left lateral position to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour. Approximately 30cc per pad.
- A physician should evaluate any pregnant patient involved in a motor vehicle collision.
- Magnesium may cause hypotension and decreased respiratory drive. Use with caution.
- **Gravida**: The total number of times a woman has been pregnant, regardless if the pregnancies were carried to term. A current pregnancy is included in this count.
- **Para**: The number of viable (> 20 weeks) births.
- Be aware with multi-gravida patients, if they indicate the baby is coming, the crew should prepare for delivery.

DOCUMENTATION REMIDER: TWO PCR's MUST BE COMPLETED (MOTHER & NEW BORN)

Childbirth Emergency

History:	Signs and Symptoms	Differential:
• Due date • LMP • High risk • Previous births • Miscarriages / abortions • Vaginal/cesarean birth • Breech • Water broke / when • Is there adequate time to transport	• Amniotic fluid • Bulging perineum • Crowning • Involuntary pushing • Contractions 2 minutes apart or less	• Imminent birth • Breech presentation • Prolapsed cord • Limb presentation • Multiple birth



Proceed to **Newly Born Care.**

Proceed to **Post-Partum Care.**

New Born Care

Post Delivery Care

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Newly Born Care – Pearls

- Record APGAR score at 1 minute then repeat at 5 minutes.

Sign	0	1	2
Appearance	Pale/Blue	Pink body, blue extremities	Pink body, pink extremities
Pulse	Absent	Less than 100	100 or greater
Grimace	No response	Grimace	Cough, sneeze
Activity	Limp	Some flexion	Action
Respiratory effort	Absent	Slow, irregular	Strong crying

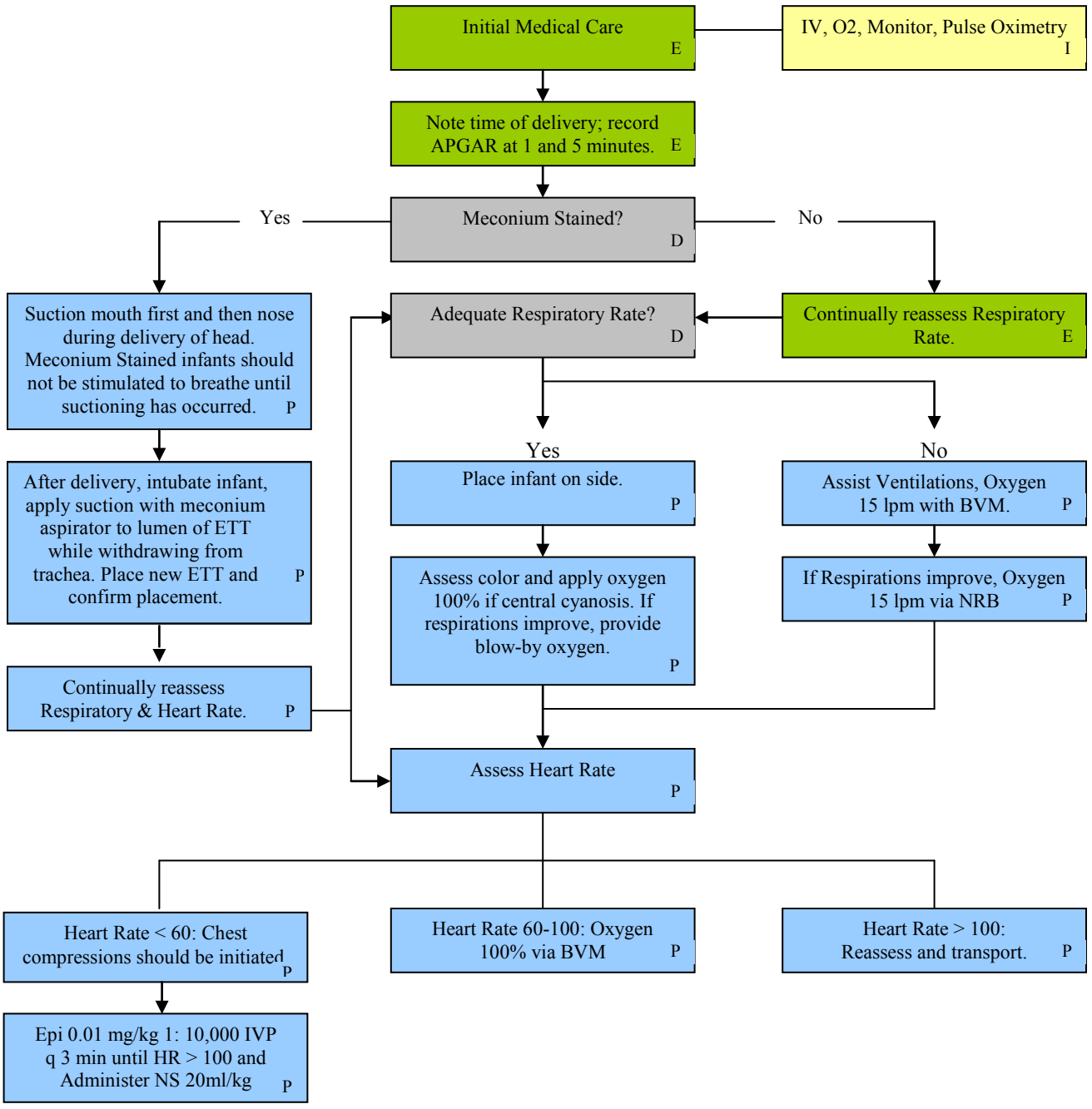
- Continually assess respiratory rate.

IF RESP. ADEQUATE / PT CRYING	**IF RESP. SHALLOW, SLOW, OR ABSENT**
• Place infant on side.	• Assist ventilations with OXYGEN @ 100% via BVM.
• Assess color and provide OXYGEN @ 100% via NRB mask if central cyanosis present.	• If respirations improve, provide OXYGEN @ 100% via NRB mask.
• If respirations improve, administer "blow-by" OXYGEN.	

New Born Care

History:	Signs and Symptoms	Differential:

• Due date / gestational age
• Multiple gestations
• Meconium
• Delivery difficulties
• Congenital disease
• Medications
• Maternal risk factors
  • Substance abuse
  • Smoking
	• Respiratory distress
	• Peripheral cyanosis or mottling
	• Central cyanosis
	• Altered level of consciousness
	• Bradycardia
		• Airway failure
		  • Secretions
		  • Respiratory drive
		• Infection
		• Maternal medication effect
		• Hypovolemia
		• Hypoglycemia
		• Congenital heart disease
		• Hypothermia



Post Partum Care

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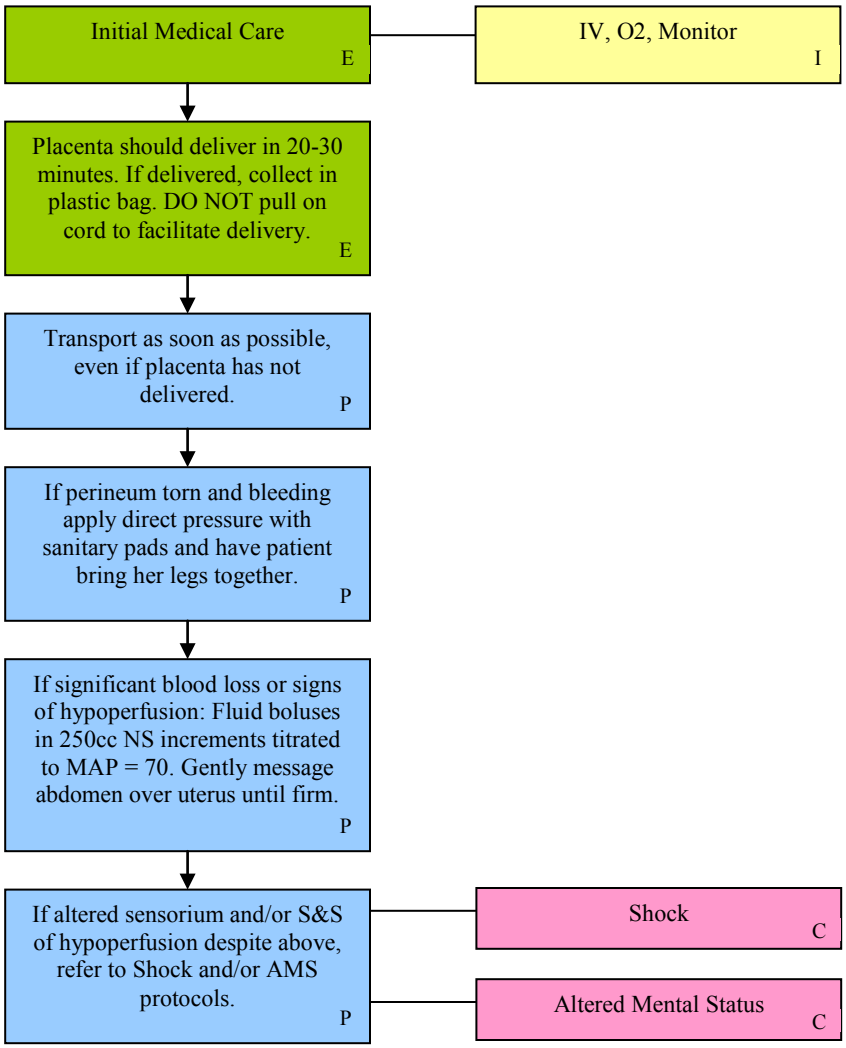
Post Partum Care – Pearls

This section intentionally left blank.

Post-Partum Care

History:	Signs and Symptoms	Differential:
• Due date / gestational age • Multiple gestations • Meconium • Delivery difficulties • Congenital disease • Medications • Substance abuse • Smoking	• Respiratory distress • Peripheral cyanosis or mottling • Central cyanosis • Altered level of consciousness • Bradycardia	• Secretions • Respiratory drive • Infection • Maternal medication effect • Hypovolemia • Hypoglycemia • Congenital heart disease • Hypothermia



Prenatal Emergencies

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Prenatal Emergencies – Pearls

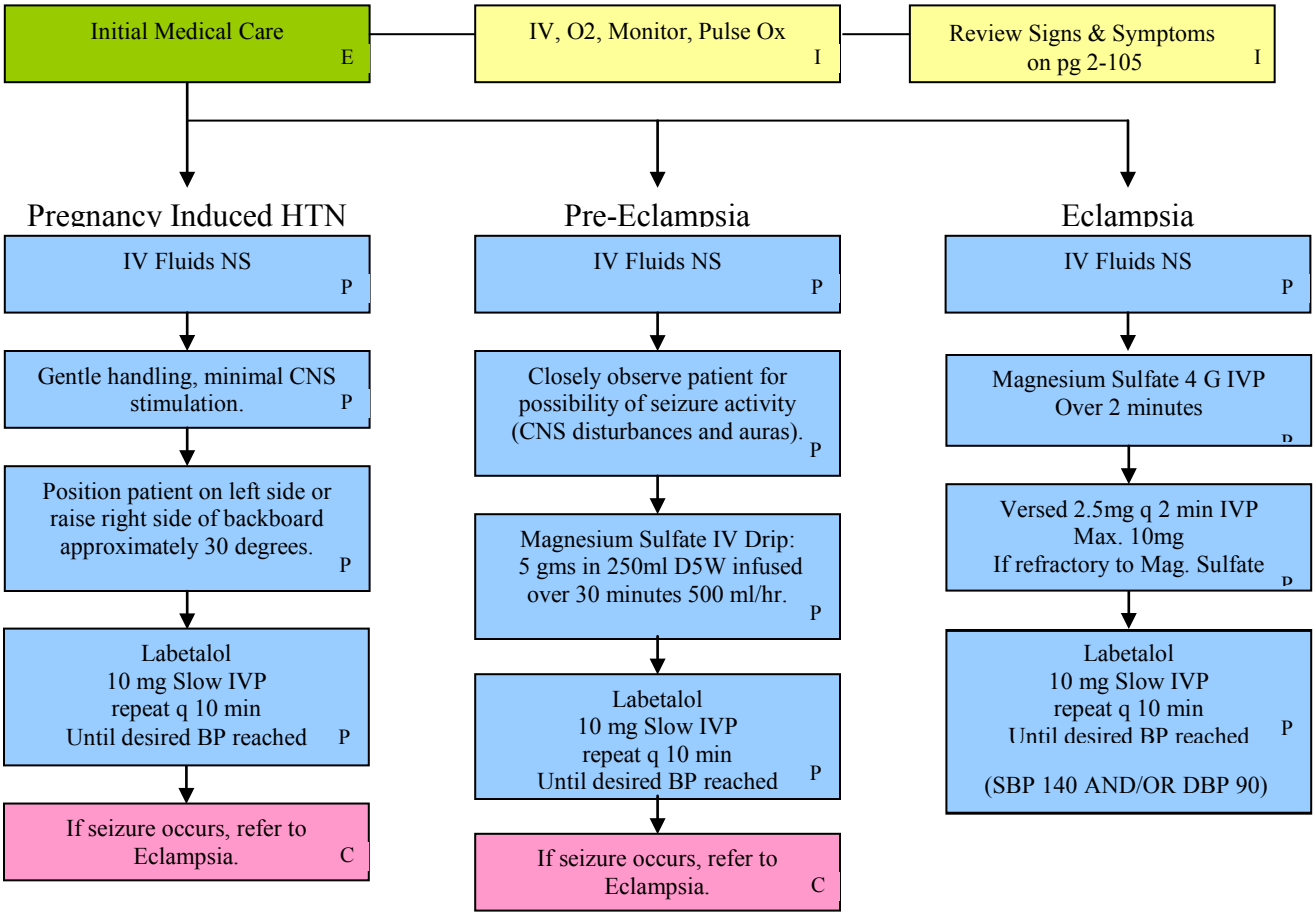
- **LABETALOL** is contraindicated for hypotension, bradycardia, AV blocks, heart failure, COPD, or asthma.
- **LABETALOL Slow IV Push over 5 min**
- **Pregnancy Induced Hypertension (PIH): Begin treating when SBP >160 and/or a DBP >110.**
- **PIH: Treat to a SBP of 140 and/or a DBP of 90.**
- **First time mothers are more prone to Pre-Eclampsia**
- **Up to 2% of women with Preeclampsia progress to Eclampsia**

- **Use the following table to assist in differentiating these prenatal emergencies:**

Signs and Symptoms of PIH	Signs and Symptoms of Pre-Eclampsia	Signs and Symptoms of Eclampsia
HTN	**HTN**	**HTN**
Weight Gain	**Epigastric or RUQ Pain**	**Seizures (tonic-clonic)**
Peripheral Edema	**N/V**	**Pre, Peri, or Postpartum up to 30 days after delivery**
	Severe and worsening headache	**Unrelenting severe headache with or without visual changes (often precedes seizures)**
	Possible visual disturbances (may include blindness)	
	Thrombocytopenia - lower than normal number of platelets in the blood (only seen in lab test)	
	Protein urea (spilling proteins) (only seen in lab tests)	

Prenatal Emergencies

History:	Signs and Symptoms	Differential:
• Due date / gestational age • Multiple gestations • Meconium • Delivery difficulties • Congenital disease • Medications • Substance abuse • Smoking	• Respiratory distress • Altered level of consciousness • Hypertension	• Secretions • Respiratory drive • Infection • Maternal medication effect • Hypovolemia • Hypoglycemia • Congenital heart disease • Hypothermia • Epilepsy



Reminder: NO LIGHTS, SIRENS OR RAPID TRANSPORT

Trauma in Pregnancy

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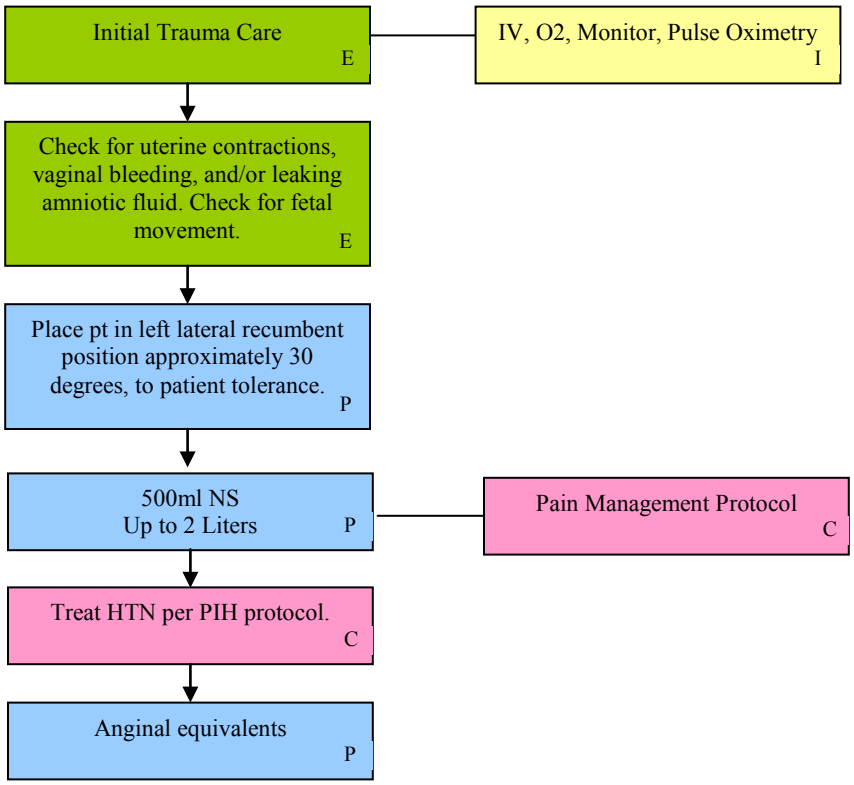
Trauma in Pregnancy – Pearls

- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation and fetal monitoring.
- Raise right side of backboard 30 degrees, unless patient distress / pain is increased.
- **MOST COMMON CAUSE OF FETAL DEATH IS MATERNAL DEATH.**
- If patient is >20 weeks gestation AND a trauma alert or trauma code transport to closest appropriate State Approved Trauma Center as per trauma transport protocol by ground or air.

Trauma in Pregnancy

History:	Signs and Symptoms	Differential:
• Due date / gestational age • Multiple gestations • Meconium • Delivery difficulties • Congenital disease • Medications • Substance abuse • Smoking	• Respiratory distress • Altered level of consciousness • Hypertension	• Secretions • Respiratory drive • Infection • Maternal medication effect • Hypovolemia • Hypoglycemia • Congenital heart disease • Hypothermia



MOST COMMON CAUSE OF FETAL DEATH IS MATERNAL DEATH.

Vaginal Bleeding

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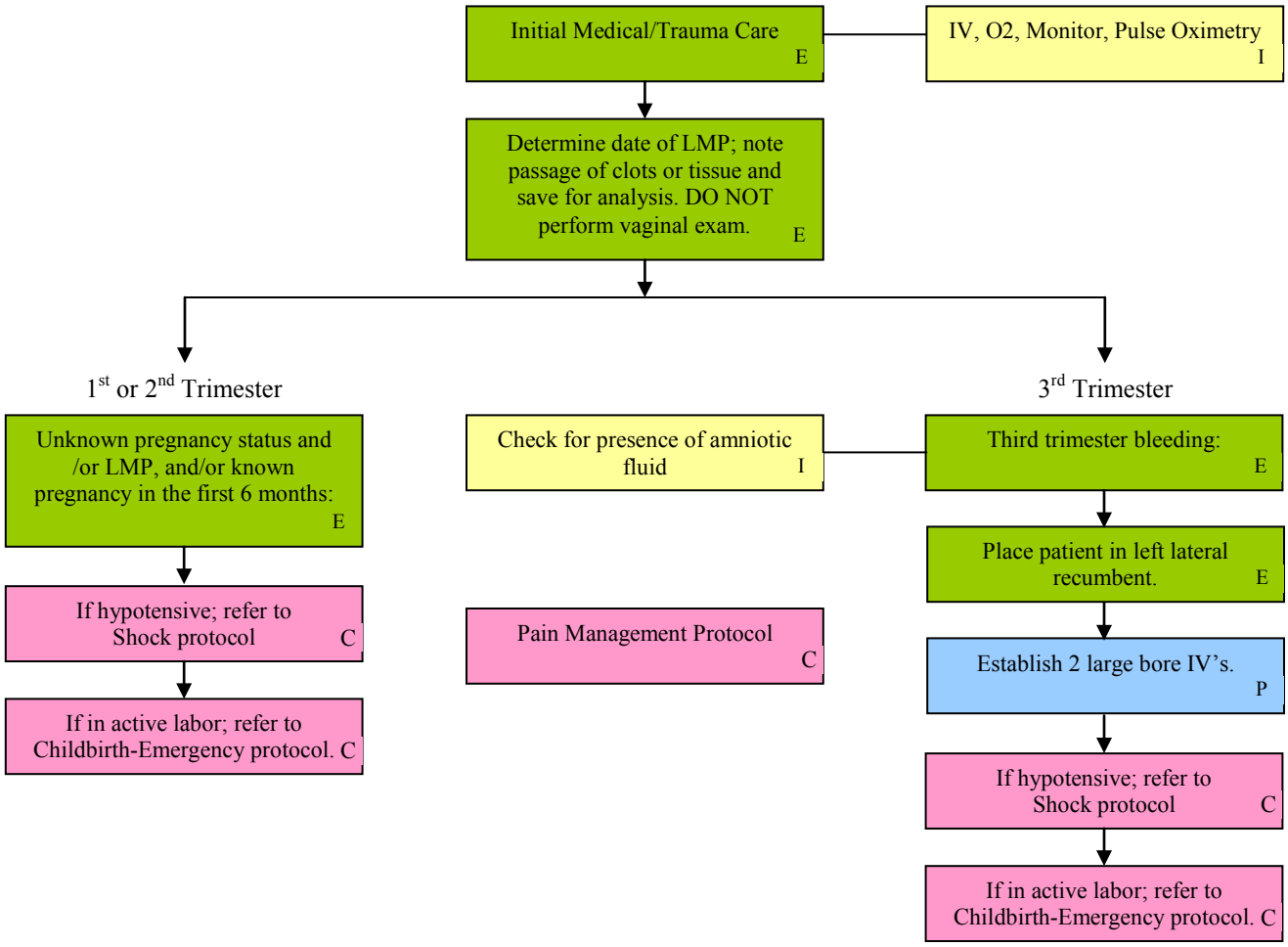
Vaginal Bleeding – Pearls

- Third Trimester bleeding:
  - Placenta previa: bright red blood, no pain.
  - Abruptio placenta: dark red blood, pain present.
  - Uterine rupture: possible bleeding, pain present and usually associated with sudden onset N/V.
- Supine hypotensive disorder: Consider left lateral recumbent position.

Vaginal Bleeding

History:	Signs and Symptoms	Differential:
• Due date / gestational age • Multiple gestations • Meconium • Delivery difficulties • Congenital disease • Medications • Substance abuse • Smoking	• Respiratory distress • Altered level of consciousness • Hypertension	• Secretions • Respiratory drive • Infection • Maternal medication effect • Hypovolemia • Hypoglycemia • Congenital heart disease • Hypothermia



Bradycardia - Pediatric

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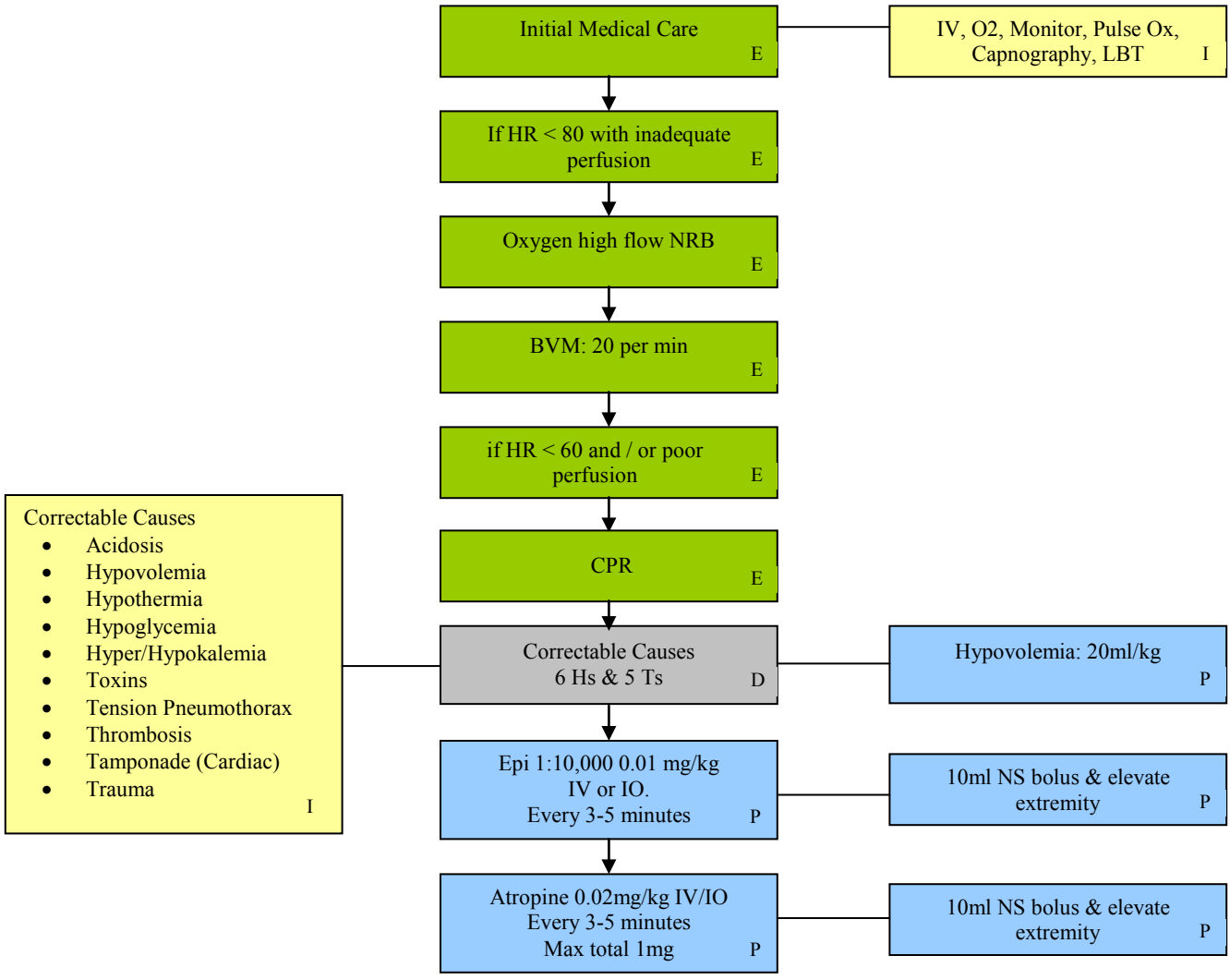
Bradycardia – Pearls

- If actual weight is available, use tape as a calculator by going directly to the weight and dosage box.
- CARDIOPULMONARY SUPPORT should be administered in a linear approach starting with OXYGEN and progressing to BVM and/or CPR if limited or no response to therapy after 30-60 seconds.
- If hypovolemia known or suspected, administer fluid boluses as calculated by Handtevy System or LENGTH-BASED TAPE (20 ml/kg).
- IV drugs should be followed with an immediate 10 ml bolus of NS and raising the arm for 15-20 sec.
- **ATROPINE**: minimum dose of 0.1 mg.
- **ATROPINE:** Max dose 1 mg
- **LBT –** Length Based Tape

Bradycardia – Pediatric

History:	Signs and Symptoms	Differential:
• Medical history • Foreign body exposure • Respiratory distress or arrest • Apnea • Toxin or poison exposure • Congenital disease	• Decreased heart rate • Delayed capillary refill or cyanosis • Mottled cool skin • Hypotension • Altered level of consciousness	• Respiratory effort • Respiratory obstruction • Foreign body / secretions • Croup / epiglotitis • Hypovolemia • Hypothermia • Infection/sepsis • Toxin or medication • Hypoglycemia • Trauma



Cardiac Arrest – Pediatric

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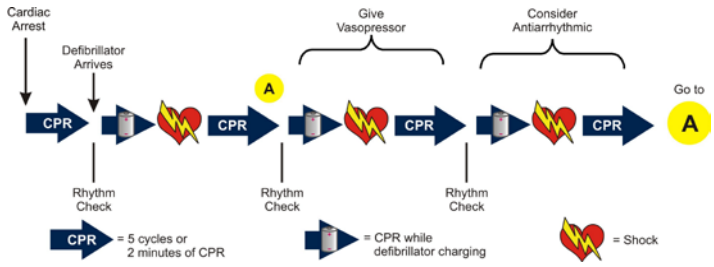
V-Fib – Pearls

- If actual weight is available, use tape as a calculator by going directly to the weight and dosage box.
- Use Handtevy or LBT for patients.
- If using an AED, follow the manufacture's prompts for cardiac arrest management (use pediatric AED system if available for children 1 to 8 years of age).
- Treatment Sequence: Prepare next drug prior to rhythm check. Administer drug during CPR, as soon as possible after the rhythm check confirms VF/pulseless VT. Do not delay shock. Continue CPR while drugs are prepared and administered and defibrillator is charging.
- IV drugs should be followed with an immediate 10 ml bolus of NS and raising the arm for 15-20 sec.
- Ideally, chest compressions should be interrupted only for ventilation (until advanced airway placed), rhythm check, and shock delivery.
- After initial intubation, confirm ETT placement after repositioning or moving patient. Administer 8-10 breaths/ minute via BVM; avoid hyperventilation.
- If hypovolemia known or suspected, administer fluid boluses as calculated by LENGTH-BASED TAPE (20 ml/kg).
- Use VERSED with caution in the presence of hypotension.

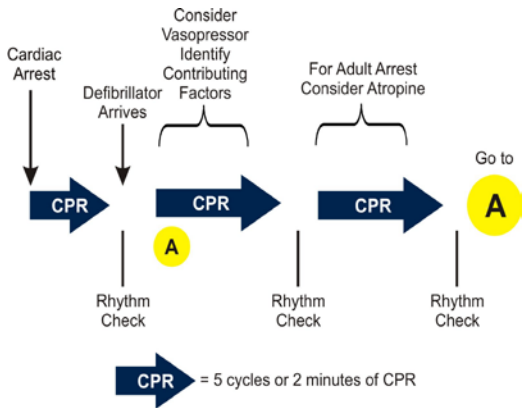
Asystole / PEA – Pearls

- If actual weight is available, use tape as a calculator by going directly to the weight and dosage box.
- If using an AED, follow the manufacture's prompts for cardiac arrest management (use pediatric AED system if available for children 1 to 8 years of age).
- Treatment Sequence: Prepare next drug prior to rhythm check. Administer drug during CPR, as soon as possible after the rhythm check confirms no VF/pulseless VT. Continue CPR while drugs are prepared and administered. Ideally, chest compressions should be interrupted only for ventilation (until advanced airway placed) and rhythm check. Search for and treat possible contributing factors.
- IV drugs should be followed with an immediate 10 ml bolus of NS and raising the arm for 15-20 sec.
- Reconfirm placement after repositioning or moving patient. Administer 8-10 breaths/minute via BVM; avoid hyperventilation.
- If hypovolemia known or suspected, administer fluid boluses as calculated by LENGTH-BASED TAPE (20 ml/kg).
- Use VERSED with caution in the presence of hypotension.

V. Fib / V. Tach

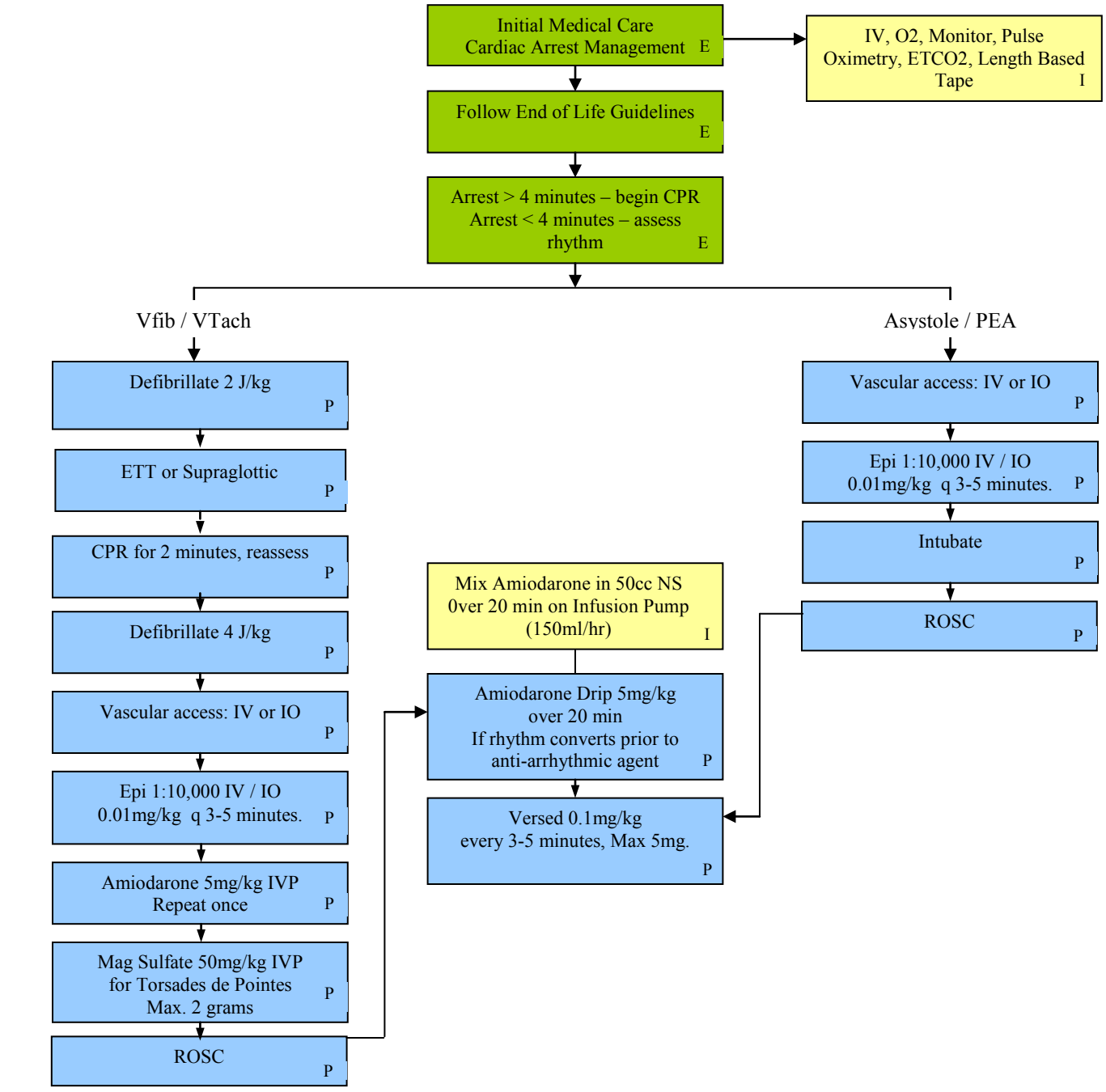


Asystole / PEA



Cardiac Arrest – Pediatric

History:	Signs and Symptoms:	Differential:
• Time of arrest. • Medication history • Medications • FBAO • Hypothermia • Shaken baby syndrome • Pattern of injuries • SIDS	• Unresponsive • Cardiac arrest	• Foreign body • Secretions • Infection • Hypovolemia • Congenital heart disease • Trauma • Tension Pneumothorax • Hypothermia • Toxin or medication • Hypoglycemia • Acidosis



Tachycardia – Pediatric

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Tachycardia – Pearls

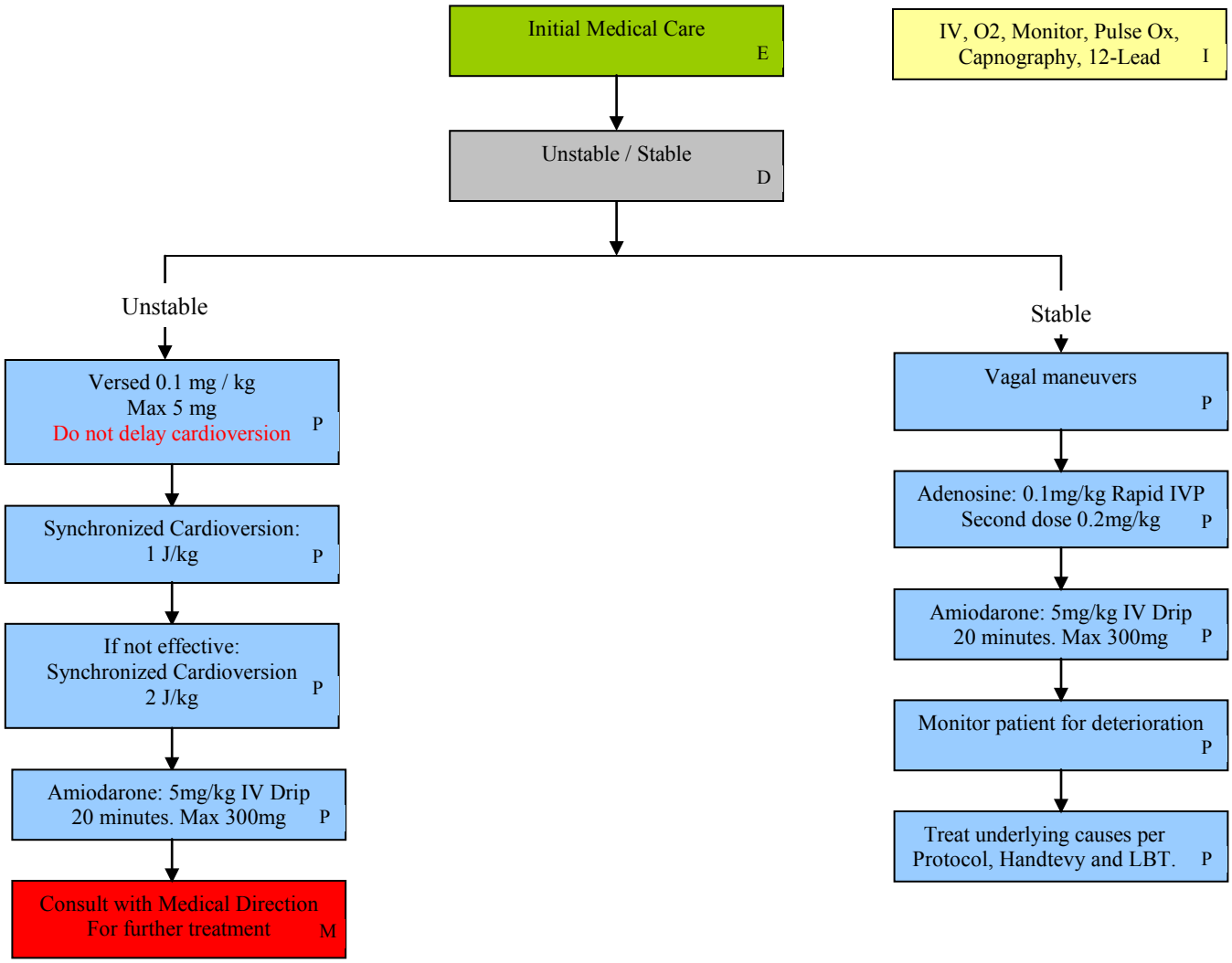
- If time, circumstances, and patient severity permit, apply capnography and record capnographic strip before any medications.
- If actual weight is available, use tape as a calculator by going directly to the weight and dosage box.
- Sinus tachycardia: p-waves present and normal, usually has variable RR intervals (varies during respirations and agitation), and constant PR interval.
    - Infants: HR usually < 220 bpm.
    - Children: HR usually < 180 bpm.
- SVT or narrow-complex tachycardia: p-waves absent / abnormal, RR intervals not variable, and history of abrupt rate changes.
    - Infants: HR usually > 220 bpm.
    - Children: HR usually > 180 bpm.
- Consider pre-medication with VERSED: 0.1 mg/kg IV/IN, repeat every 3-5 minutes until adequate relaxation/sedation is achieved prior to procedure (max total dosage 4 mg). Use VERSED with caution in the presence of hypotension.
- If rhythm does not convert after first syncronized cardioversion attempt, escalate energy level to 2 J/kg to a max of 200 J for subsequent SYNCHRONIZED CARDIOVERSIONS.
- If delays in synchronization occur and clinical condition is critical, proceed immediately to unsynchronized shocks i.e. defibrillation.

PEDIATRIC / CHILDREN VITAL SIGNS

		Blood Pressure			
Age	Respiratory	Systolic	Diastolic	Pulse	Weight (lb)
Neonate	60	80	46	110 - 150	6.6
3 months	40	89	60	110 - 140	11
6 months	30	89	60	100 - 140	16.5
1 year	25	89	60	100 - 140	22
2 years	20	96	84	90 - 100	27.5
3 years	20	100	70	80- 120	33
4 years	20	100	70	80 - 100	39.6
5 years	20	100	70	80 - 100	44
6 years	20	100	56	80 - 100	55
10 years	15	114	60	70 - 110	

Tachycardia – Pediatric

History:	Signs and Symptoms	Differential:
• Medical history • Medications or toxic ingestion • Drugs • Congenital heart disease • Respiratory distress • Syncope or near syncope	• Heart rate • Pale or cyanosis • Diaphoresis • Tachypnea • Hypotension • AMS • Pulmonary congestion • Syncope	• Heart disease • Hypo/hyperthermia • Hypovolemia/anemia • Electrolyte imbalance • Anxiety / Pain / Stress • Fever / Infection / Sepsis • Hypoxia • Hypoglycemia • Pulmonary embolus • Trauma • Tension Pneumothorax



Pediatric Tachycardia will usually respond to aggressive BLS measures and fluid!

Abdominal Pain -Pediatric

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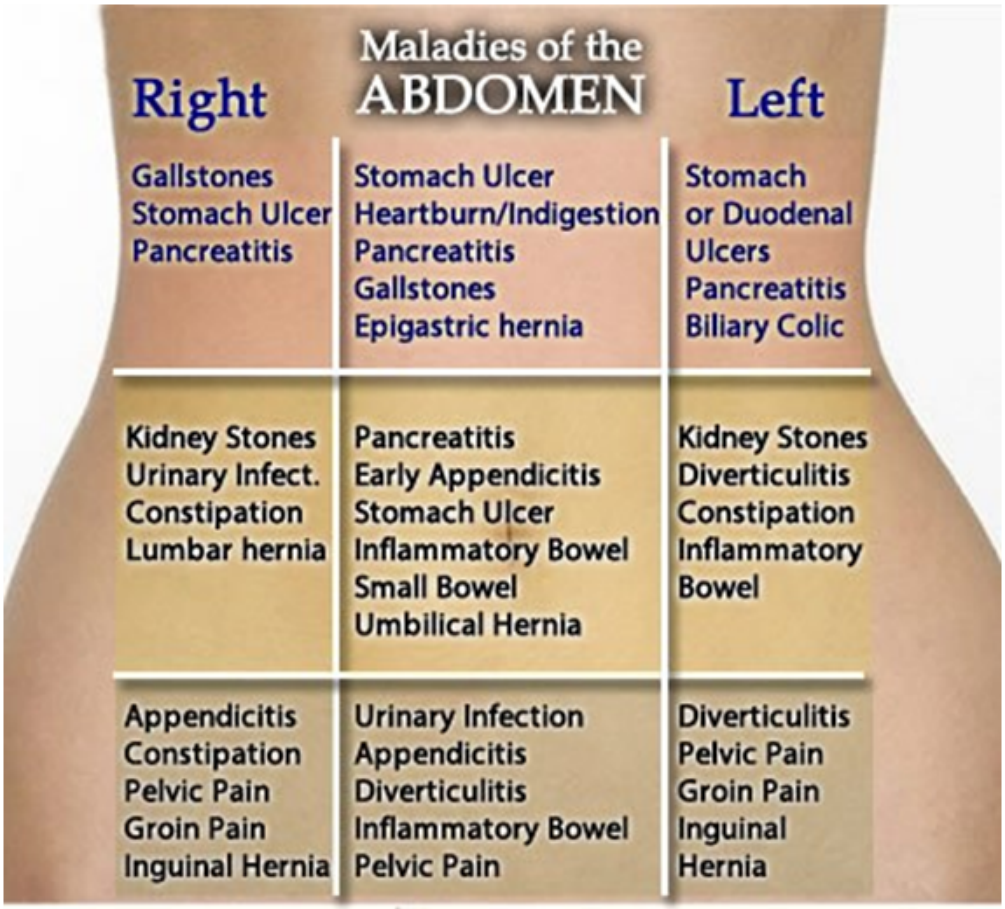
Abdominal Pain – Pearls

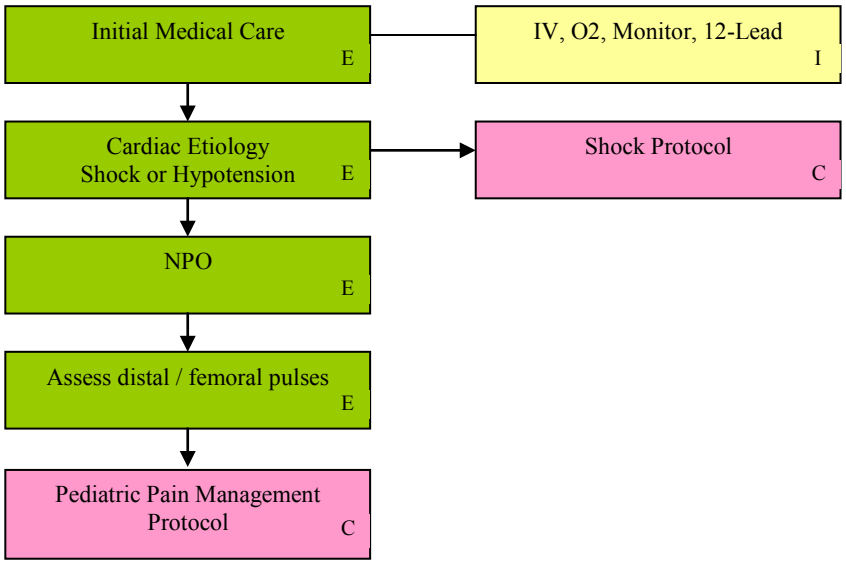
- Required Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neurological
- Appendicitis presents with vague, periumbilical pain, which migrates to the RLQ over time.
- Repeat vital signs after each bolus. May give fluid bolus PRN to MAP ≥70 max and patient condition.

Most common causes of abdominal pain and their locations broken down to nine quadrants.



Abdominal Pain -Pediatric

History:	Signs and Symptoms	Differential:
• Age • Past medical/surgical history • Medications • Onset • Palliation/Provocation • Quality (crampy, constant, sharp, dull, etc) • Region/Radiation/Referred • Pain severity (0-10) • Time (duration, repetition) • Fever • Last meal • Last BM/Urination • Menstrual history	• Pain (location/migration) • Tenderness • Nausea • Vomiting • Diarrhea • Dysuria • Constipation • Vaginal bleeding/discharge	• Pneumonia, pulmonary embolus • Liver (hepatitis) • Peptic ulcer • Gallbladder • Myocardial infarction • Pancreatitis • Kidney stone • Abdominal aneurysm • Appendicitis • Bladder/prostrate disorder • Spleen enlargement • Diverticulitis • Bowel obstruction • Gastroenteritis



Allergic Reaction- Pediatric

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Allergic Reaction – Pearls

- Exam: Mental Status, Skin, Heart, Lungs
- Epinephrine may precipitate cardiac ischemia. These patients should receive a 12 lead ECG.
- Scrape away and remove any stingers and/or flush any contaminated skin

KNOWN ALLERGY TO: FOOD, MEDICATION, INSECT OR LATEX

Confirmed ingestion OR envenomation OR Significant signs and symptoms:

Epinephrine 1:1,000 0.01 mg/kg SQ

OR

Epinephrine 1:10,000 0.01mg/kg IV/IO

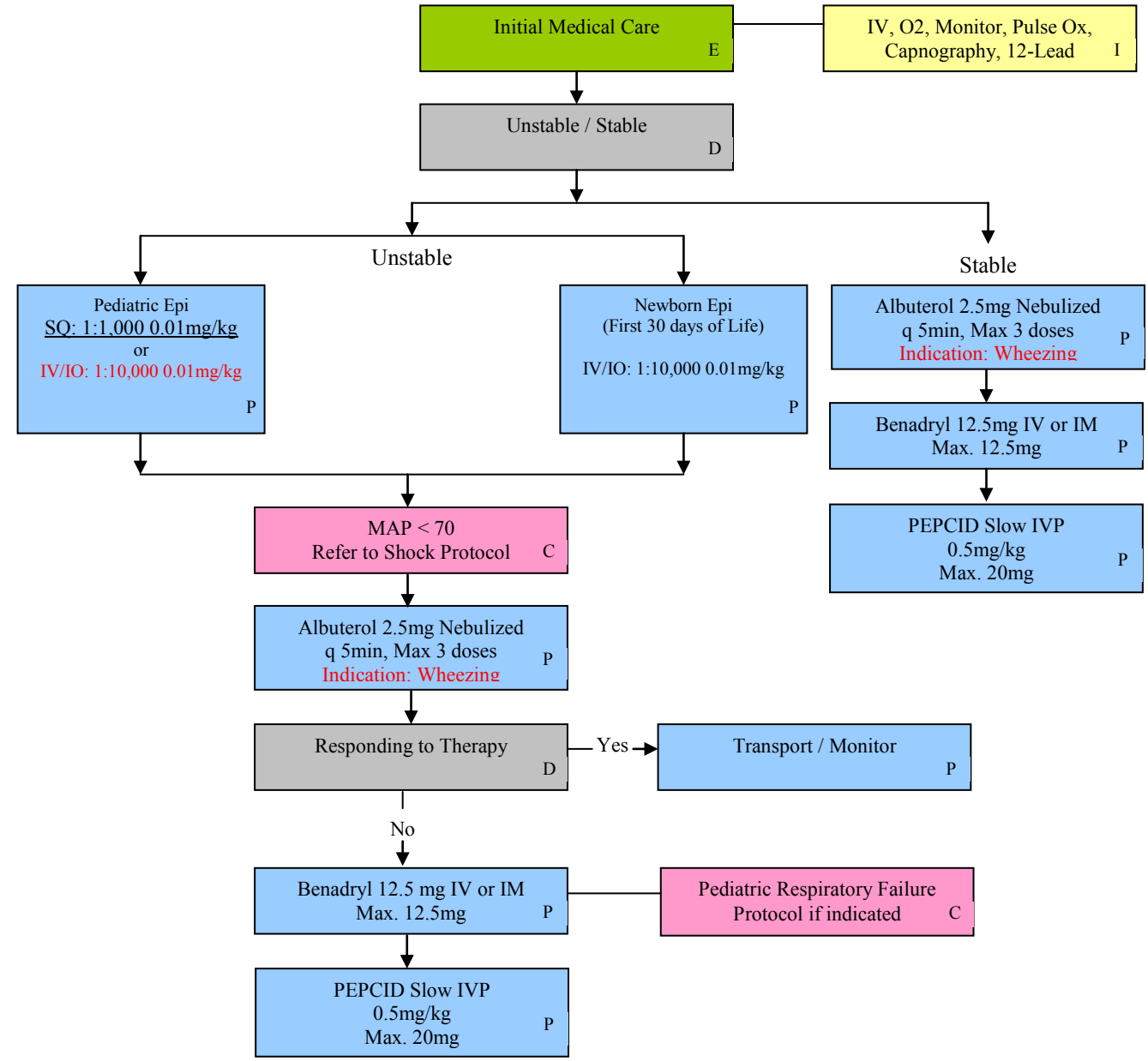
Stable	Unstable
Usually longer onset (one hour or days)	Usually rapid onset 30-60 seconds
Normal vitals	Signs of Shock (MAP < 70)
Urticaria (Hives)/Rash/ Itching	Urticaria (Hives)/Rash/ Itching
Sense/Feeling of Dyspnea (Anxiety)	Objective Signs of Respiratory Distress: such as Stridor
Sense/Feeling of Orpharyngeal Swelling	Objective signs of Airway Compromise
Sense/Feeling of Throat Tightness	

- Any patient with respiratory symptoms or extensive reaction should receive IV or IM **BENADRYL** (Max Dose: 12.5mg).
- The shorter the onset from symptoms to contact, the more severe the reaction.
- **A NEWBORN is categorized as a patient in the first 30 days of life.**
- **PEPCID (0.5mg/kg IVP)** Famotidine can be used in combination with an H1 antagonist (Benadryl) to treat and prevent urticaria caused by an acute allergic reaction.
    - PEPCID competitively inhibits the action of histamine at the histamine H2-receptors.
    - Rare instances of arrhythmias and hypotension have been reported following rapid IV bolus
    - PEPCID - SLOW IVP – over 2 minutes
    - PEPCID is indicated even in the presence if hypotension

MONITOR THE PATIENT CLOSELY FOR RAPID DETERIORATION.

Allergic Reaction

History:	Signs and Symptoms	Differential:
• Onset and location • Insect sting or bite • Food allergy/exposure • Medication allergy/exposure • New clothing, soap, detergent • History of reactions • Past medical history • Medication history	• Itching or hives • Coughing/wheezing or respiratory distress • Chest or throat constriction • Difficulty swallowing • Hypotensive or shock • Edema	• Urticaria (rash only) • Anaphylaxis (systemic effect) • Shock (vascular effect) • Angioedema (drug induced) • Aspiration/airway obstruction • Vasovagal event • Asthma or COPD • CHF



Glycemic Emergencies- Pediatric

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Glycemic Emergencies – Pearls

- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Recheck blood glucose after administration of **DEXTROSE** or **GLUCAGON**.
- Do not give oral glucose if patient cannot protect own airway.
- There may be times when patients refuse further treatment or transport after hypoglycemic episode. These patients will be allowed to refuse transport under the following criteria:

REFER TO REFUSAL OF SERVICE ADMINISTRATIVE POLICY.

- The term "neonate" refers to infants in the first 28 days (month) of life. AHA ECC publications, the term "newly born" refers specifically to the neonate in the first minutes to hours following birth.
  The term "infant" includes the neonatal period and extends to the age of 1 year (12 months).
  For the purposes of these guidelines, the term "child" refers to the age group from 1 year to 8 years.

- Dosage:
  Newborn/Neonate: 5-10ml/kg **D10W**
  To facilitate mixing, use 50cc NS bag, remove 10cc of solution and add 10cc of Dextrose 50% to form 50cc of 10% concentration. Appropriate dose can be withdrawn and administered IV or IO

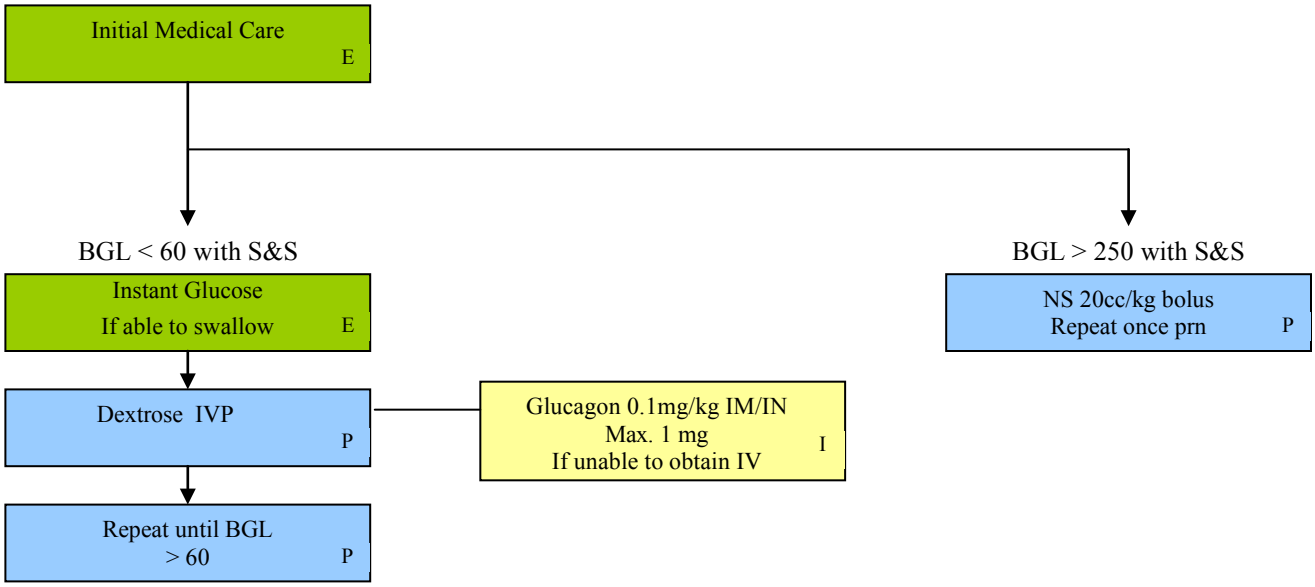
  Infant and Children: 2-4ml/kg **D25W**

  D25 – Push out half amp of dextrose and refill syringe with NS

  > 8 yrs old: 1-2ml/kg **D50W**

Glycemic Emergencies - Pediatric

History:	Signs and Symptoms	Differential:
• Onset and Duration • History of hypertension • Seizures • Medical History • Pre-Eclampsia • Drug or alcohol use • Head trauma • Current medications • Allergies	• Headache • Nose bleed • Dizziness • Syncope • Weakness • Speech difficulties • Abdominal pain • Visual disturbances • Projectile vomiting	• Altered mental status • Hypoglycemia • Hyperglycemia • Trauma • CNS disorders



Nausea & Vomiting - Pediatric

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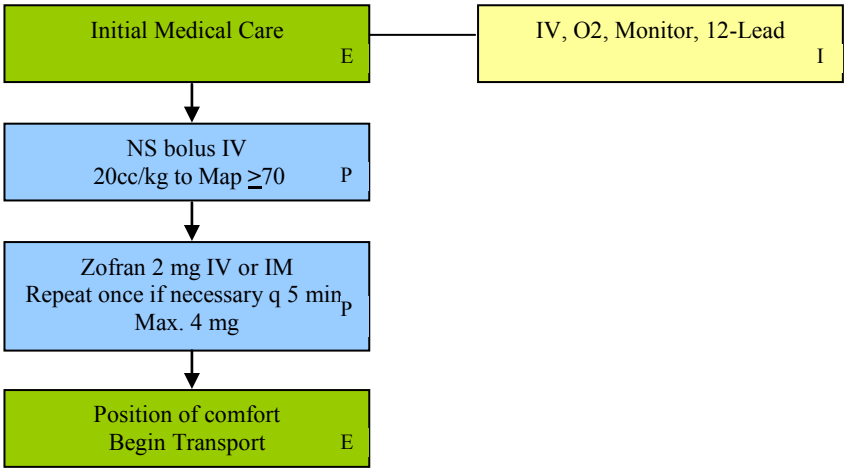
Nausea & Vomiting – Pearls

- Required Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neurological
- Frequent reassessments are needed to monitor vascular status.

Nausea & Vomiting - Pediatric

History:	Signs and Symptoms	Differential:
• Age • Past medical/surgical history • Medications • Onset • Travel history • Other sick contacts • Improvement with food/activity • Region/Radiation/Referred • Pain severity (0-10) • Time (duration, repetition) • Fever • Last meal • Last BM/Urination	• Pain (location/migration) • Distention • Nausea • Vomiting • Diarrhea • Dysuria • Constipation	• CNS (increased pressure, headache, stroke, CNS lesions, trauma) • Drugs (NSAIDs, antibiotics, narcotics, chemotherapy) • GI or Renal disorders • Diabetic ketoacidosis • Infections (pneumonia, influenza) • Electrolyte imbalances • Food or toxin induced • Psychological



Seizures- Pediatric

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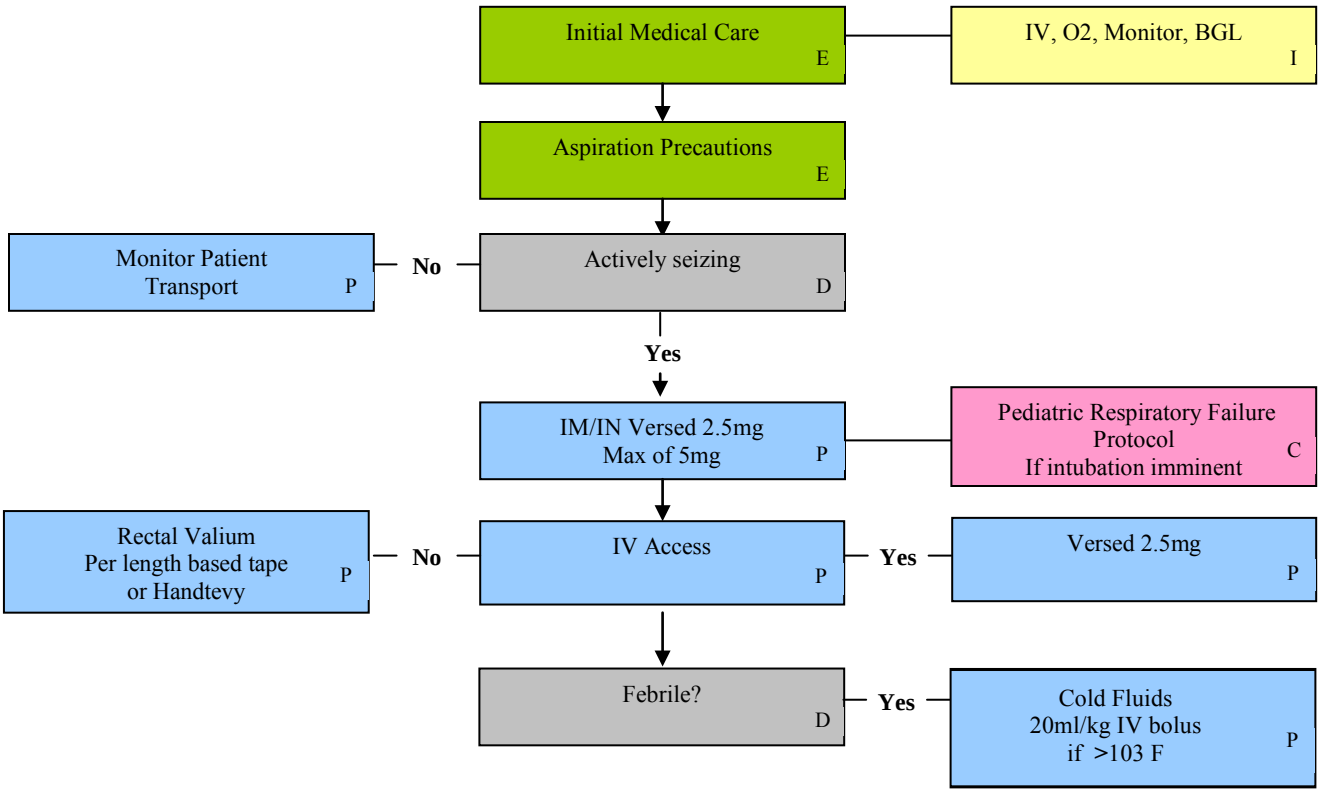
Seizures – Pearls

- **Any actively seizing patient on arrival shall have IM/IN Versed administered as a first line intervention.**
- After IM/IN Versed establish IV access X1 attempt. If unable to obtain IV access repeat IM/IN Versed to max of 5mg
- If IV is already established then refer to IV access
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures (petit mal)** effect only a part of the body and are not usually associated with loss of consciousness.
- **Jacksonian seizures** are seizures which start as a focal seizure and become generalized (grand mal).
- Be prepared for airway problems and continued seizures.
- If evidence of or suspicion of trauma, immobilize.
- If febrile, remove clothing and sponge with **room temperature water.**
- In an infant, a seizure may be a sign of a closed head injury.
- LBT – Length Based Tape
- Rectal Valium should be followed by a Tylenol suppository if patient is FEBRILE and if Tylenol suppository is available via family.

EZ-IO is not indicated if patient is Febrile.

Seizures- Pediatric

History:	Signs and Symptoms	Differential:
• Reported/witnessed seizure • Seizure history • Medical alert tag info • Seizure medications • History of trauma • History of diabetes • History of pregnancy	• Decreased mental status • Sleepiness • Incontinence • Observed seizures • Evidence of trauma • Unconscious	• CNS trauma • Tumor • Hypoxia • Electrolyte abnormality • Drugs, medications • Infection/fever • Alcohol withdrawal • Eclampsia • Stroke • Hyperthermia • Hypoglycemia



Shock- Pediatric

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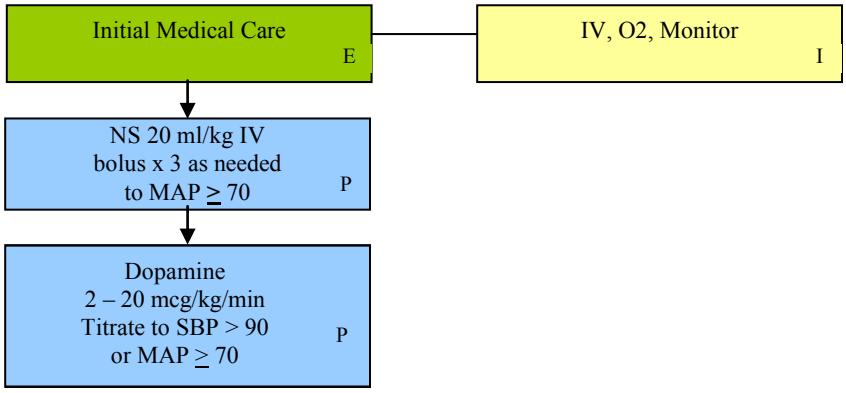
Pediatric Shock – Pearls

- Hypotension can be defined as a systolic blood pressure of less than 90.
- Consider performing orthostatic vitals signs on patients in non-trauma situations if suspected blood or fluid loss.
    - Positive orthostatic changes:
        - Decrease in systolic blood pressure by 10 mmHg or
        - Increase in pulse rate by 10 beats per minute.
- Consider all possible causes of shock and treat per appropriate protocol.
- **RELATIVE HYPOVOLEMIA**
    - Neurologic, septic, metabolic, psychogenic, or other volume depleted states.

		Blood Pressure			
Age	**Respiratory**	**Systolic**	**Diastolic**	**Pulse**	**Weight (lb)**
Neonate	60	80	46	110 - 150	6.6
3 months	40	89	60	110 - 140	11
6 months	30	89	60	100 - 140	16.5
1 year	25	89	60	100 - 140	22
2 years	20	96	84	90 - 100	27.5
3 years	20	100	70	80- 120	33
4 years	20	100	70	80 - 100	39.6
5 years	20	100	70	80 - 100	44
6 years	20	100	56	80 - 100	55
10 years	15	114	60	70 - 110	

Shock- Pediatric

History:	Signs and Symptoms	Differential:
• Blood loss • Fluid loss: vomiting, diarrhea, fever • Infection • Medications • Allergic reaction • History of poor oral intake • Cardiac	• Restlessness, confusion • Weakness, dizziness • Weak, rapid pulse • Pale, cool, clammy skin • Delayed cap refill • Hypotension • Bloody stools	• Dysrhythmias • Pulmonary embolus • Tension Pneumothorax • Medication effect/overdose • Vasovagal • Physiologic



Esophageal Foreign Body Obstruction- Pediatric

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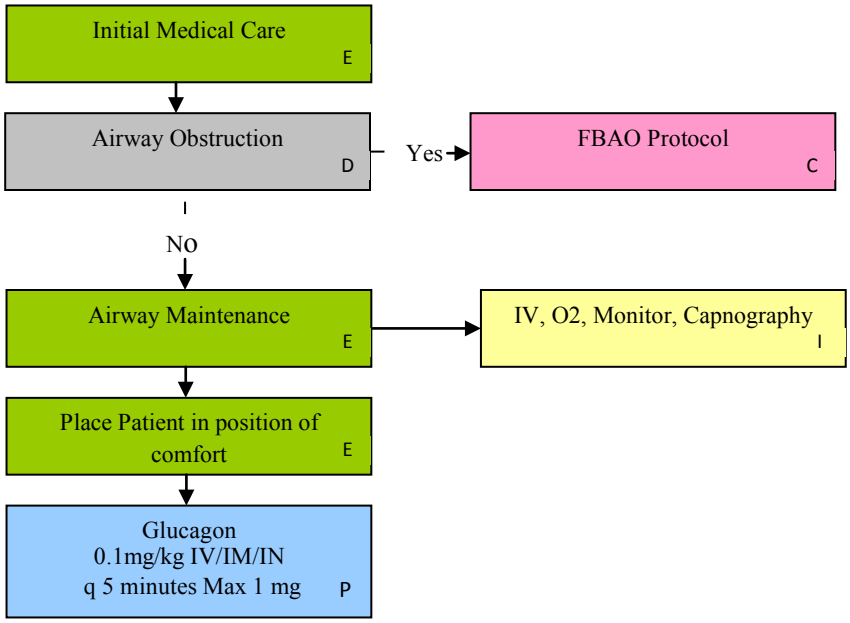
Esophageal Foreign Body Obstruction – Pearls

- Establish INITIAL MEDICAL CARE including Capnography after airway is secured. All patients should seek medical attention.
- Glucagon decreases lower esophageal sphincter tone without interfering with esophageal contractions (acts as a smooth muscle relaxer).
- Usually caused by food and/or bones.
- Most common obstruction among children is a coin (80%).

Esophageal Foreign Body Obstruction- Pediatric

History:	Signs and Symptoms	Differential:
• Partial obstruction • Complete obstruction • Esophageal CA • Esophageal strictures • Esophageal disease	• Coughing • Difficulty or inability swallowing • Drooling • Apparent distress • Anxiety/Stress • Throat pain • Gagging • Blood-stained saliva • Chest Pain	• Globus hystericus (“lump in throat”) • Esophagitits • Croup • Epiglottitis • Upper respiratory tract infection



Respiratory Distress- Pediatric

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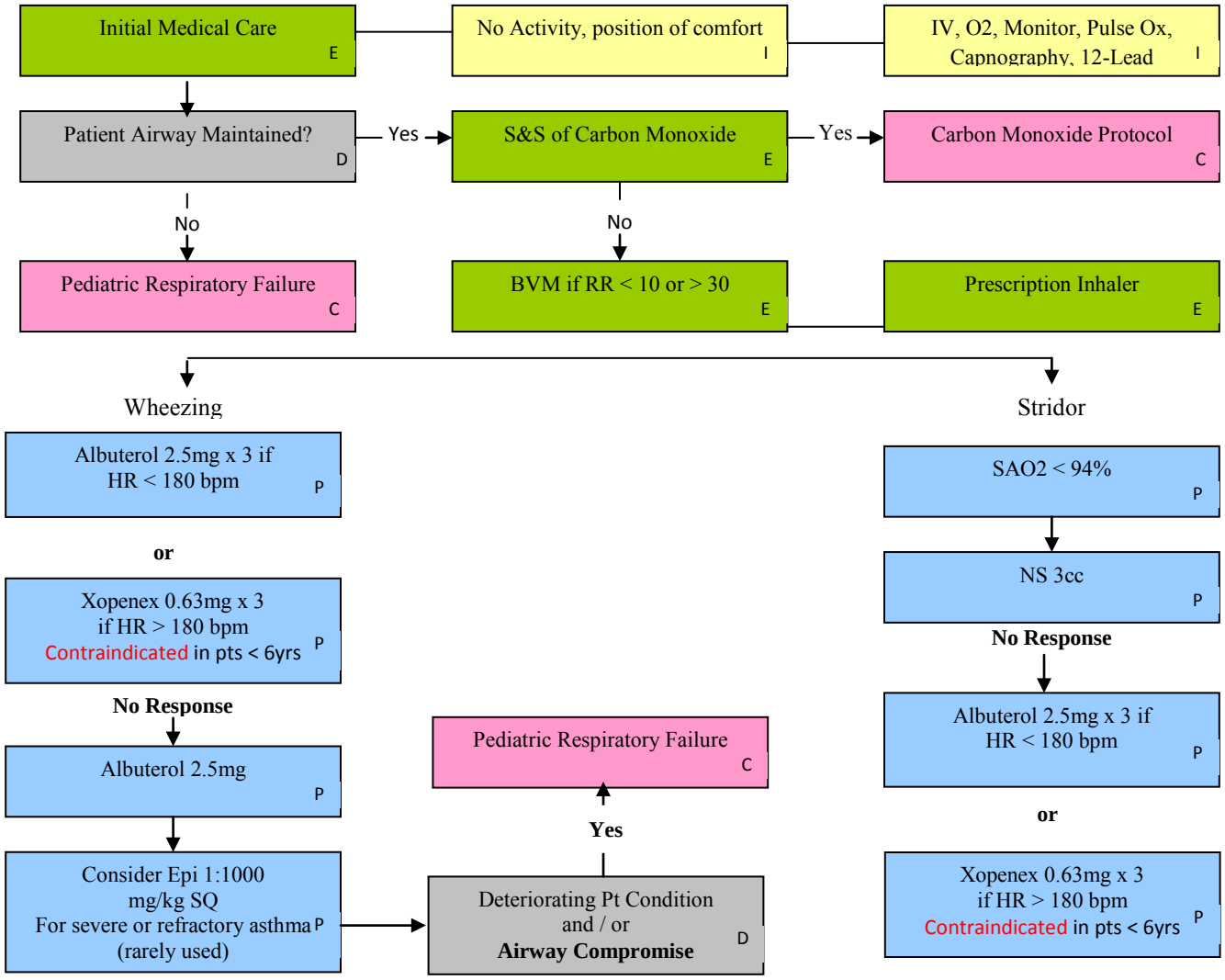
Respiratory Distress – Pearls

- If time, circumstances, and patient severity permit, apply capnography and record capnographic strip, before any medications. Continue to monitor and record strips as treatment progresses. **Do not treat solely on waveform findings**.
- Do not administer **ALBUTEROL** significant ventricular ectopy. If patient presents with mild ventricular ectopy that is unresolved with aggressive oxygen therapy, **XOPENEX** is the preferred medication if child > 6 y.o. If ventricular ectopy is unresolved or worsens discontinue updraft immediately.
- **XOPENEX** contraindicated for children < 6 y.o.
- **ATROVENT** is contraindicated in patients <12 y.o.
- **ALBUTEROL** no age restriction**.**
- Maximum dose of IV Epinephrine is 0.3mg/dose.
- Do not force a child into a specific position; children will protect their airway by their body position.
- Bronchiolitis is a viral infection that typically affects infants, results in wheezing, does not usually respond to Albuterol.
- **Croup** typically affects children < 2 yo. +viral infection, +/- fever, gradual onset, - drooling.
- **Epiglotitis** typically affects children > 2 yo. +bacterial, +fever, rapid onset, +drooling, possible stridor, patient will want to sit upright to keep airway open. Manipulation of the airway may worsen the condition.
- **Wheezing** typically requires consideration of foreign body occlusion.

Respiratory Distress- Pediatric

History:	Signs and Symptoms	Differential:
• Asthma; COPD – chronic bronchitis, emphysema, congestive heart failure • Home treatment (oxygen, nebulizer) • Medications (theophylline, steroids, inhalers) • Toxic exposure, smoke inhalation	• Shortness of breath • Pursed lip breathing • Decreased ability to speak • Increased resp. rate and effort • Wheezing, rhonchi, rales, stridor • Accessory muscle use • Fever, cough • Tachycardia	• Asthma • Anaphylaxis • Aspiration • COPD • Pleural effusion • Pneumonia • Pulmonary embolus • Pneumothorax • Cardiac (MI or CHF) • Pericardial tamponade • Hyperventilation • Inhaled toxin (Carbon monoxide)



Pediatric Respiratory Failure - Pediatric

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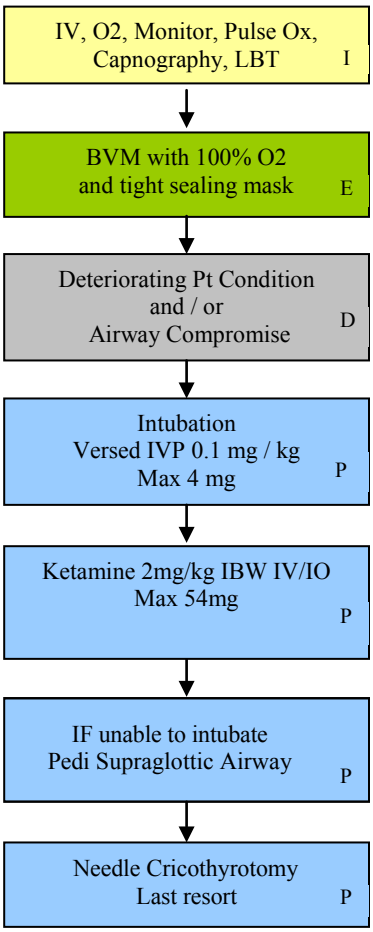
Pediatric Respiratory Failure – Pearls

- If actual weight is available, use tape as a calculator by going directly to the weight and dosage box.
- Apply CAPNOGRAPHY before any medication is administered (if time, circumstances, and patient severity permit). Record a capnographic strip as documentation of the patient's dyspnea ("shark-fin" waveform indicative of bronchial constriction). Continue to monitor and record waveforms as treatment progresses. **Do not treat based solely upon capnographic waveform findings.**
- Do not attempt aggressive airway intervention unless airway becomes obstructed. Use an ET tube one size smaller than the recommended size according to the LENGTH-BASED TAPE. If the patient is physiologically difficult to intubate (severe anxiety, etc).
- IBW- Ideal body weight
- LBT – Length Based Tape or Handtevy system
- ETT size is determined by the following formula:
    - 16 plus the patient's age divided by 4 (Round Down To Lowest Number)
- iGel size is determined by the patient weight.

Pediatric Respiratory Failure - Pediatric



AGE	Weight	Ketamine Dose
1 y/o	10kg	20mg
2 y/o	12kg	24mg
3 y/o	15kg	30mg
4 y/o	17kg	34mg
5 y/o	20kg	40mg
6 y/o	22kg	44mg
7 y/o	25kg	50mg
8 y/o	27kg	54mg

Pediatric Pain Management

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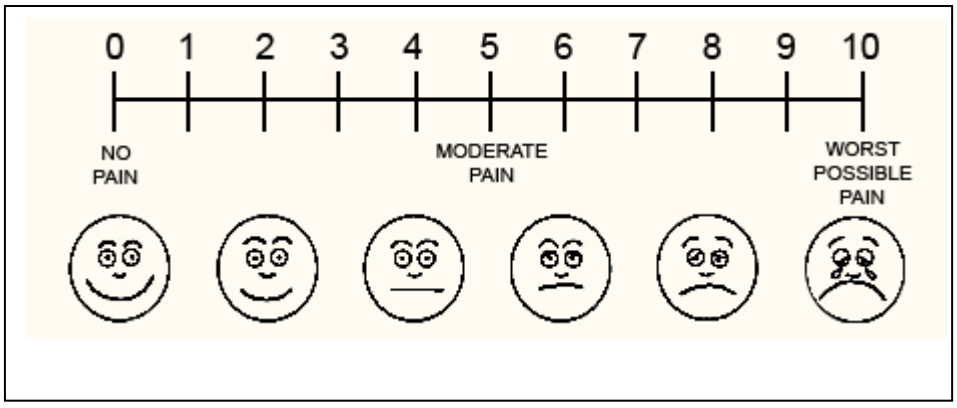
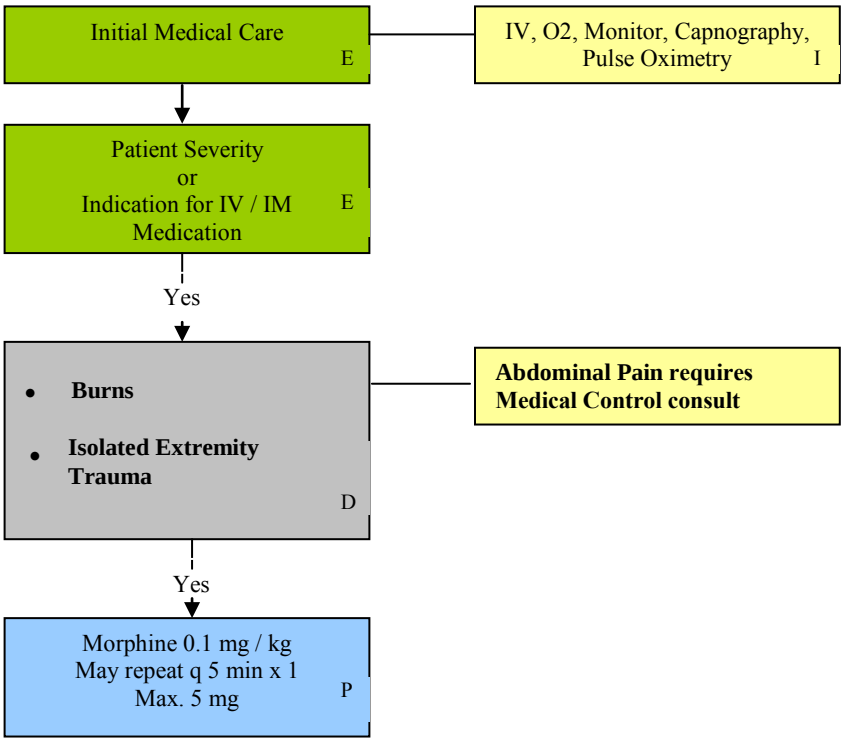
Pediatric Pain Management – Pearls

- Maximum dose: Morphine = 5mg
- Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.
- Vital signs should be obtained premedication, 15 minutes post medication, and at disposition with all pain medications.
- Contraindications to morphine use include hypotension, head injury, respiratory distress.
- All patients should have drug allergies documented prior to administering pain medications.
- All pain not related to isolated extremity trauma (or on burns protocol) requires medical control consultation prior to morphine administration.



Pediatric Pain Management

History:	Signs and Symptoms	Differential:
• Age • Location • Duration • Severity (1-10) • Past medical history • Medications • Drug allergies	• Severity (pain scale) • Quality (sharp, dull, etc.) • Radiation • Relation to movement, respiration • Increased with palpation of area	• Per the specific protocol • Musculoskeletal • Visceral (abdominal) • Cardiac • Pleural / Respiratory • Neurogenic • Renal (colic)



SECTION THREE

PROCEDURES

PROCEDURE GUIDELINE
AED

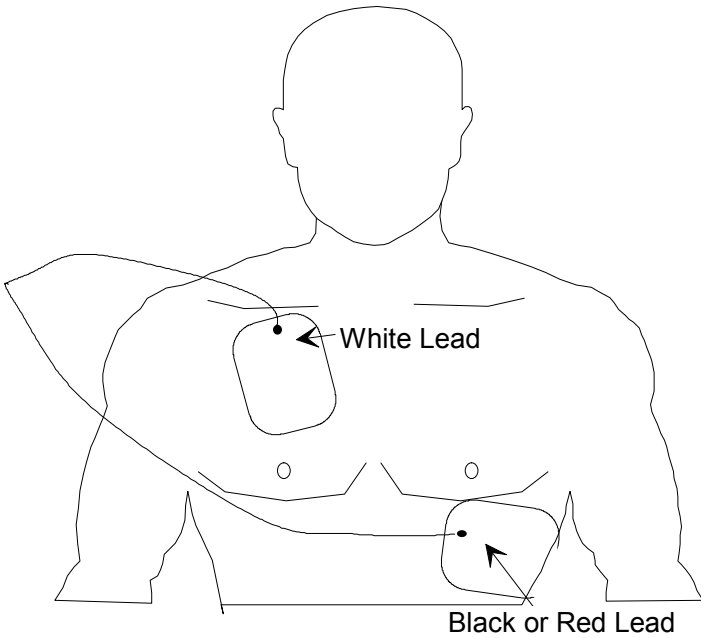
1. Indications:
   - Cardiac Arrest.
   - 8 years of age or older.

2. Procedure:
   - Remove clothing from patient's chest.
   - Wipe patient's chest dry, and trim any long hair in areas where you will place defibrillator pads.
   - Turn AED "ON".
   - Attach defibrillator pads to white and black chest leads.
   - Apply defibrillator pads to patient using Anterior/Anterior placement:

     Apply PAD and STERNUM (white) wire to upper sternum (above the right nipple, below right the clavicle).

     Apply PAD and APEX (black or red) wire to the lower left chest (below and to the left of the left nipple toward midaxillary line). ***(SEE DIAGRAM BELOW.)***

   - Stop CPR, activate analyze sequence.
   - Follow commands given by AED.

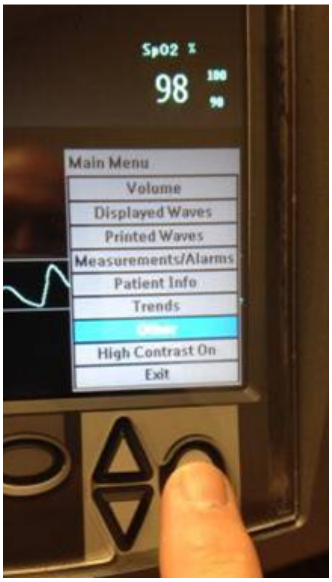


PROCEDURE GUIDELINE
Bluetooth

PART ONE:

Transferring EKG's & all monitor event data from Philips monitor to the Tough Book

- **Once it is safe for you to leave patient monitoring, i.e. (Stable patient; at the hospital; end of call; etc...) continue with the following steps:**
- On your Phillips EKG monitor go to Menu and select "other"
- Then select "Data Management"
- Acknowledge leaving patient monitoring

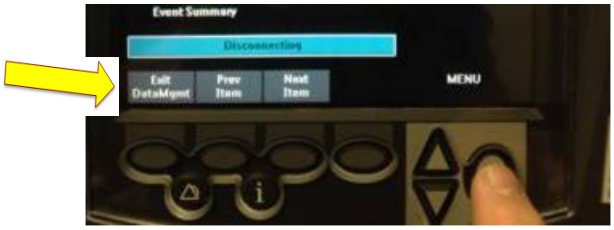


- Select event you want to attach to the ePCR using PREV/NEXT buttons.

- Scroll up to "send" button on "Menu" (check mark)
  Select "All event data"
- Confirm Tough Book ID

- "Connecting to device window" will appear
- Sending data could take several minutes
- After "Disconnecting" displays, EKG records have been transferred to the Tough Book

- Then select "Exit Data Management" to return to patient monitoring or to shut down the monitor

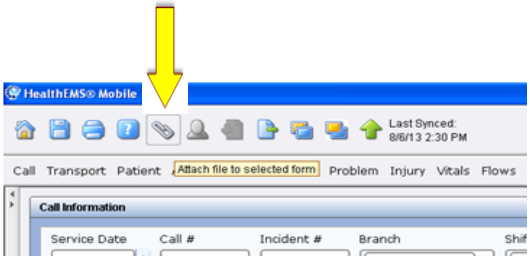


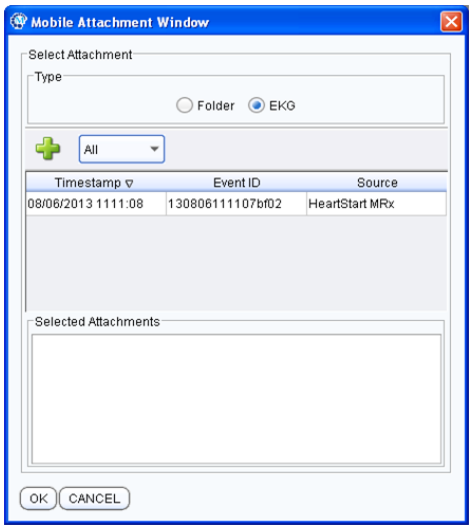
PROCEDURE GUIDELINE
Bluetooth (continued)

Part Two:

Attaching EKG's to the ePCR

1 Select the paper clip icon to attatch the EKG file to the ePCR you are completing.





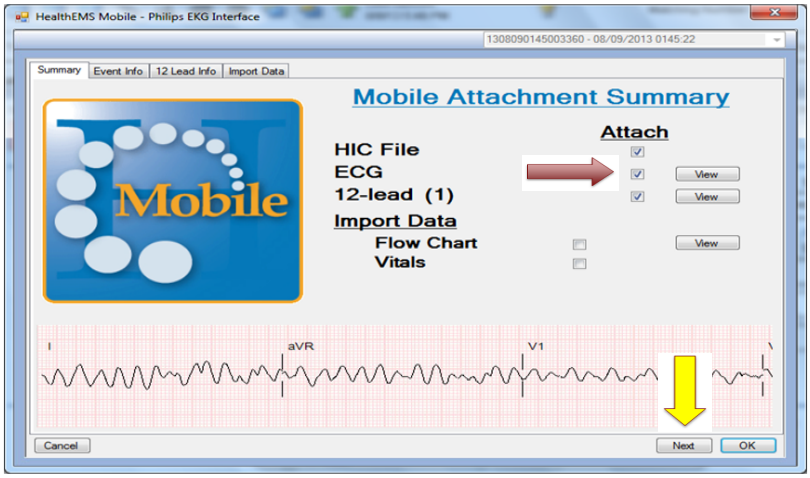
2 The "Mobile Attachment Window" launches.

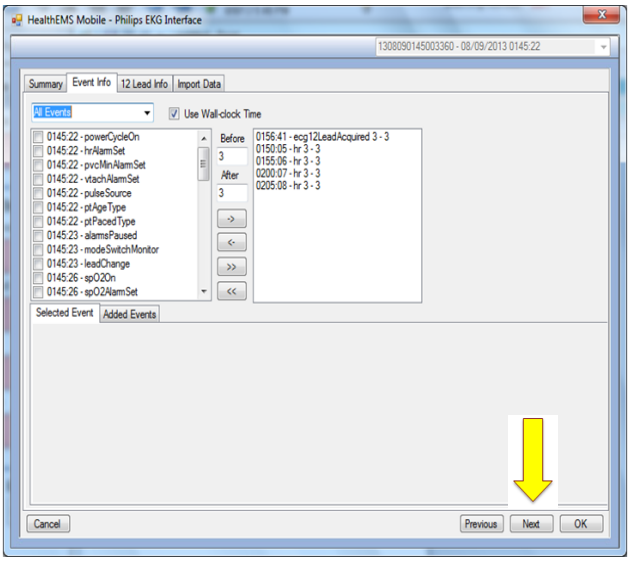
Double click the numbers below "Event ID"

3 "Mobile Attachment Summary" pops up

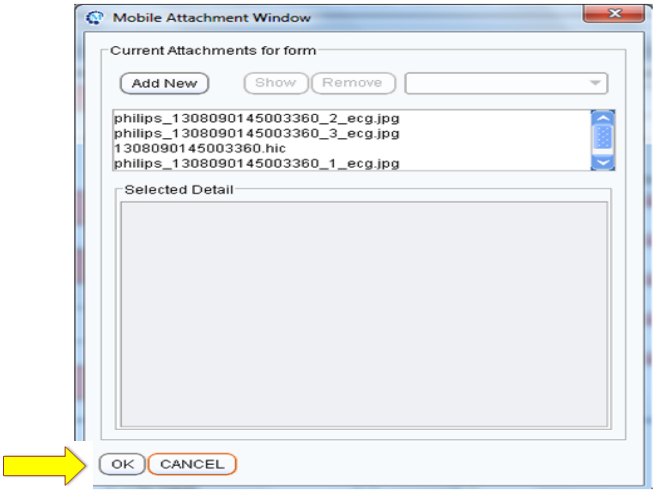
Simply click "Next"

Do not unselect any check boxes including the HIC file !!





4 Click "Next" on this window.



5 Click "OK" on this window.

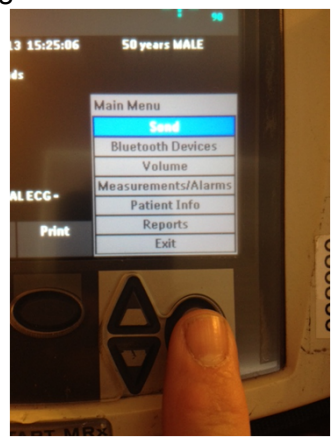
You have completed the attachment of your EKG to the ePCR

PROCEDURE GUIDELINE
Bluetooth

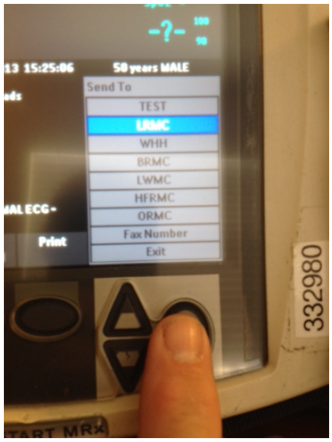
Transmitting EKG's to hospital

- Start by acquiring 12 Lead EKG.
- Any positive STEMI, abnormal or questionable 12 Lead should be transmitted to receiving hospital.

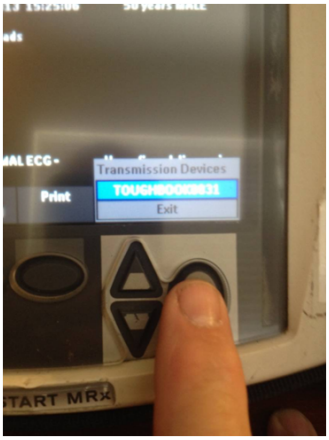
1 After acquiring the 12 Lead select the menu button.



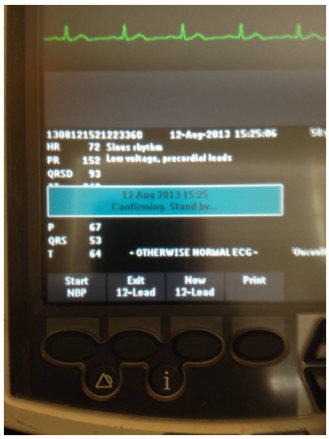
2 Scroll up to "Send"



3 Select hospital you are sending EKG to.



4 Confirm you Tough Book ID.



5 "Connecting to device" screen will appear.

You will see a box on the Tough Book showing the file transfer.
This is not adding the EKG to your Tough Book or ePCR!! It is only using the Tough Book to transmit the EKG(s) to the chosen hospital.

When the transmission is complete you will see "Disconnecting" on the monitor screen and monitor will return to normal operation.

Be sure to notify the receiving facility that you have sent the EKG via Bluetooth transmission.

PROCEDURE GUIDELINE
AUTOVENT 3000

1. **Indications:**

   - To provide ventilatory support in the intubated adult patient during interfacility transfers.
   - To assist ventilations in the intubated medical patient.

2. **Contraindications:**

   - Trauma patients.
   - Pediatric patients.

3. **Equipment:**

   - Oxygen supply with greater than 500 psi.
   - Stethoscope.
   - Bag Valve Mask for ventilatory backup.
   - Suction on stand-by.

4. **Procedure:**

   - Connect the oxygen high pressure line to the quick-connect Oxygen adapter. Connect (Hand tighten) the other end to the gas inlet of the control module.
   - Connect (Hand tighten) the Patient Valve Supply tubing to the Patient Valve outlets of the control module.
   - After initial control module settings have been made, connect the patient Valve Assembly directly to the endotracheal tube adapter.
   - During interfacility transfers, maintain the BPM and Tidal Volume settings per physician orders.

5. **Assess the following parameters immediately after connecting the patient to the ventilator:**

   a. Breaths Per Minute (BPM), adjust the BPM control knob to maintain an adequate ventilatory rate. Average adult settings are greater than or equal to 12 BPM.

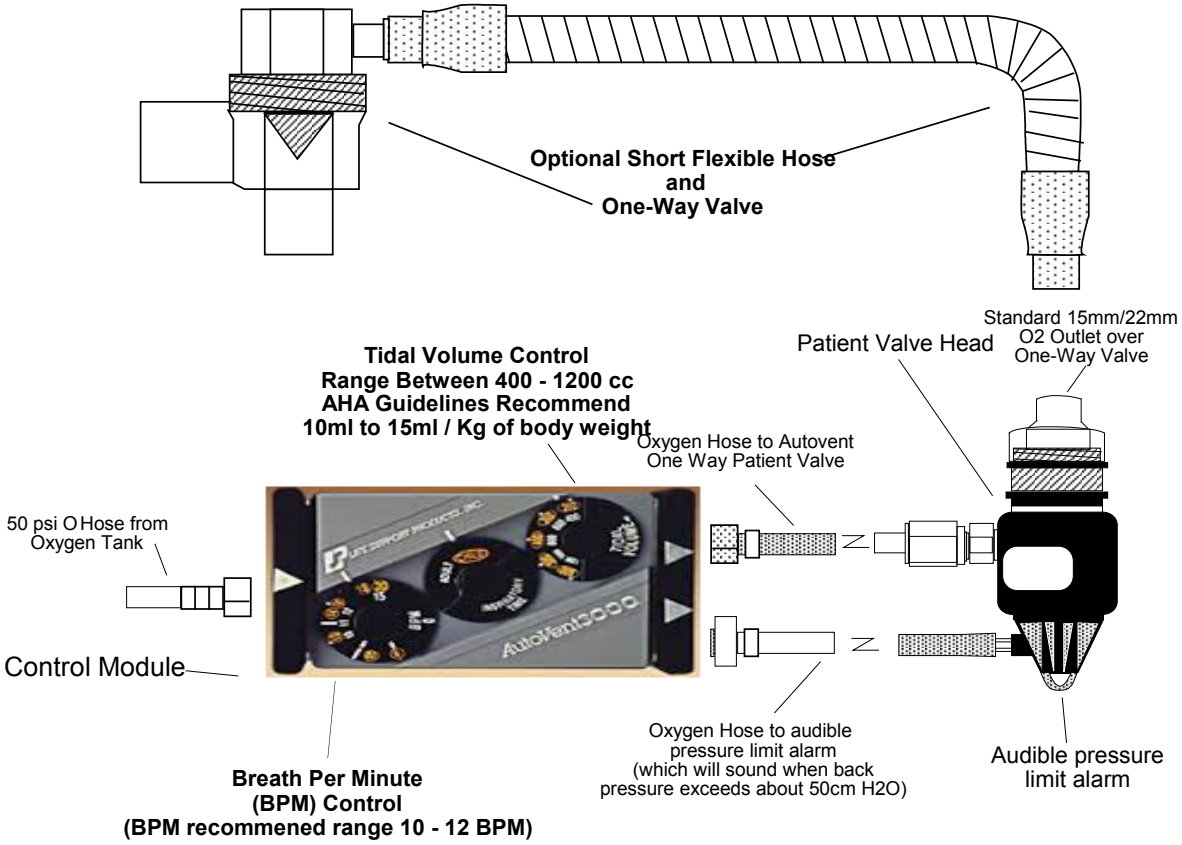
   b. Tidal Volume, adjust for adequate bilateral chest rise and fall to maintain an adequate ventilatory depth. Average adult settings are between 400 to 1,000 ml.

   c. Ensure Inspiratory Time knob is located in correct position for Adult or Child patient.

   d. Auscultate for the presence of bilateral breath sounds and the absence of abdominal sounds.

   e. Reassess and document breath sounds every 10 minutes or when change in the patient's chief complaint, level of consciousness, airway, breathing, circulation, and vital signs to ensure that endotracheal tube is still in proper position.

PROCEDURE GUIDELINE
AUTOVENT 3000 (CONTINUED)



Caution: *All Connections should be firmly hand tightened only.*

PROCEDURE GUIDELINE
BLOOD ALCOHOL DRAW ON SCENE

PATIENT- (person that will be treated and transported)

1. INITIAL MEDICAL CARE.

2. Treat the patient per the appropriate PROTOCOL.

3. Determine if you can safely (without jeopardizing patient care) draw the blood and convey to officer requesting draw.

4. Draw blood as per procedure (see next page)

5. Record date on kit, officer's name, and how you drew blood in your report.

6. Complete the appropriate sections of paperwork enclosed with the blood draw kit which pertain to EMS as directed by Law Enforcement Officer.

REFUSAL OF MEDICAL CARE- (person that will be treated and released)

1. Assess the patients mental ability to refuse
   - If mentally incompetent, enlist law enforcement to aid transport.
   - If mentally competent, completely advise patient of possible complications (with witness present) and advise patient they will have to sign refusal.

2. Draw blood as per procedure (see next page)

3. Record date on kit, officer's name, and how the blood was drawn in your report. Have the patient sign a refusal, if warranted, and have the same officer witness the refusal.

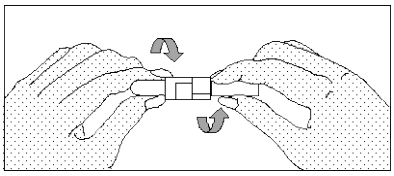
4. Complete the appropriate sections of paperwork enclosed with the blood draw kit which pertain to EMS as directed by Law Enforcement Officer.

Note:* ***All legal blood draws, regardless of patient chief complaint, are considered ALS patients for the purpose of care & documentation. *A patient history and assessment that includes vital signs, blood glucose level, and EKG should be obtained, on all patients that are having blood drawn.***

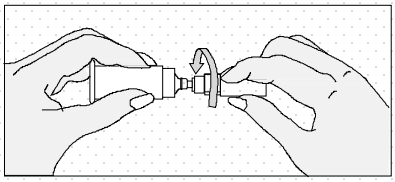
PROCEDURE GUIDELINE
BLOOD DRAW USING VACUTAINER

Procedure:

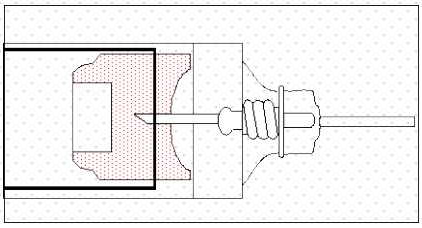
1. Open needle cartridge. Twist to break the tamper-evident seal. Remove cap, exposing the back portion of the needle and threaded hub. Do not remove front needle cover.



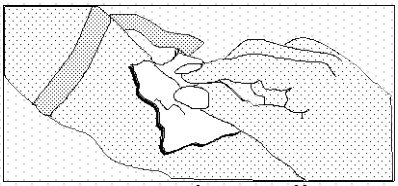
2. Assemble needle to holder. Thread needle into holder until firmly seated.



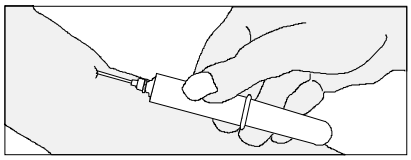
3. Insert VACUTAINER tube into holder. Push straight onto needle, no further than the guideline on the holder.



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

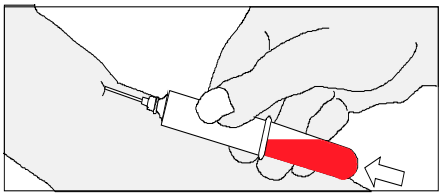


5. Remove needle cover; perform venipuncture in the usual manner, keeping the tube in an upward position with the stopper upper-most.

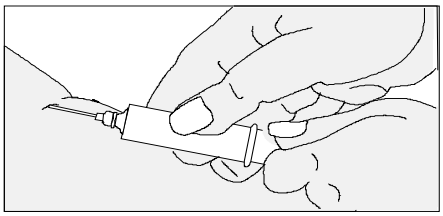


PROCEDURE GUIDELINE
BLOOD DRAW USING VACUTAINER (CONTINUED)

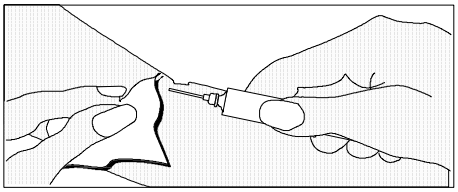
6. Push VACUTAINER tube forward to end of holder, piercing the rubber stopper. When blood flows into tube, REMOVE TOURNIQUET AS SOON AS BLOOD BEGINS TO FILL TUBE. DURING THIS PROCEDURE, DO NOT ALLOW CONTENTS OF VACUTAINER TUBE TO CONTACT STOPPER. SPECIAL ATTENTION SHOULD BE GIVEN TO ARM POSITION, TUBE POSITION IN ORDER TO PREVENT POSSIBLE BACKFLOW FROM THE TUBE AND ITS ATTENDANT POSSIBILITY OF ADVERSE REACTION TO THE PATIENT.



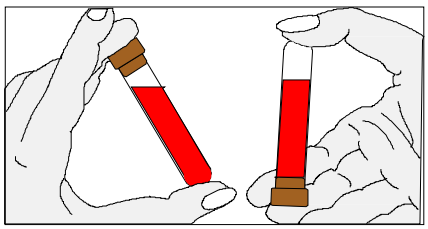
7. When the tube fill is complete and blood ceases to flow, remove the tube from the holder. Insert the second VACUTAINER tube straight into the holder until blood flows.



8. When sampling is completed immediately remove the needle/holder assembly with the last VACUTAINER, then remove the tube from the assembly: Apply and hold a dry sterile compress to the venipuncture site. Elevate the arm.



9. To assure proper mixing with anticoagulant powder, slowly invert the tubes at least five times immediately after blood collection. DO NOT SHAKE VIGOROUSLY!



PROCEDURE GUIDELINE
BLOOD GLUCOSE TEST

CONTROL TEST

The Control Test confirms that the system is functioning properly and must be done each Monday, any time you receive a new vial of test strips and anytime blood glucose test results are in question.

1. **Equipment:**
   - Glucometer Meter
   - Glucometer Control Solution
   - Glucometer Test Strip

2. **Control Test:**
   - Insert the test strip and turn on the meter
   - Apply control solution
   - Read and compare the results with the test strip vial

If the Control Test result does not fall within the stated range, the Meter is malfunctioning.

BLOOD GLUCOSE TEST

1. **Indications:**
   - Altered sensorium or suspected blood sugar abnormality based on history.

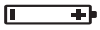
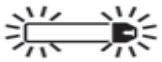
2. **Equipment:**
   - Glucose Meter
   - Glucometer Test Strip
   - Lancet

3. **Prepare Lancing Device for a finger stick**

4. **Performing the test**
   - Insert test strip to turn on the meter
     - Wait for the meter to display the test strip and blood symbol
   - Clean a desired site
   - Obtain a blood sample
     - Use the lancet to puncture the clean desired site. After penetration, discard the first drop of blood with a clean 4x4.
     - Gently squeeze the area around the puncture site to obtain another drop of blood.
     - Don’t smear the blood
   - Apply the sample
     - Hold the drop to touch the absorbent hole of the test strip. Blood will be drawn in and after the confirmation window is completely filled.
     - The meter will count down.
   - Read the results
   - Eject the test strip
   - Discard the lancet

PROCEDURE GUIDELINE
BLOOD GLUCOSE TEST (CONTINUED)

Result Readings/Error Codes

Display	Action
The meter will not turn on or the display is blank.	• Battery is dead. Insert new battery. • Display is damaged. Contact **Supervisor** • Meter is defective. Contact **Supervisor** • Extreme temperatures. Move the meter to a more temperate area.
	Battery power is low. Change the battery soon.
	The meter is in set-up mode, waiting for you to change or confirm settings.
	The meter is ready for you to insert a test strip.
	The meter is ready for a drop of blood or control solution.
HI	Blood glucose may be higher than the measurement range of the system. **Expect >600 mg/dl**.
LO	Blood glucose may be lower than the measurement range of the system. **Expect <20 mg/dl.**
E-1	The test strip may be damaged or not properly inserted. Remove and reinsert the test strip or replace it if damaged.
E-2	The code key is incorrect. Turn the meter off and insert a **black** code key. If you need a black code key, contact the ACCU-CHEK Customer Care Service Center at 1-800-858-8072.
E-4	Not enough blood or control solution was drawn into the test strip for measurement or was applied after the test had started. Discard the test strip and repeat the test.
E-6	Blood or control solution was applied to the test strip before the flashing drop symbol appeared on the display. Discard the test strip and repeat the test.
E-8	The temperature is above or below the proper range for the system. Refer to the test strip package insert for system operating conditions. Move to an area with the appropriate conditions, wait 5 minutes, and repeat the blood glucose or control test. Do not artificially heat or cool the meter.

More maintenance and troubleshooting tips can be found on device insert or website.

PROCEDURE GUIDELINE

PROCEDURE GUIDELINE

PROCEDURE GUIDELINE
CAPNOGRAPHY

END-TIDAL CO_2 ($EtCO_2$) MONITORING:

I. INDICATIONS:

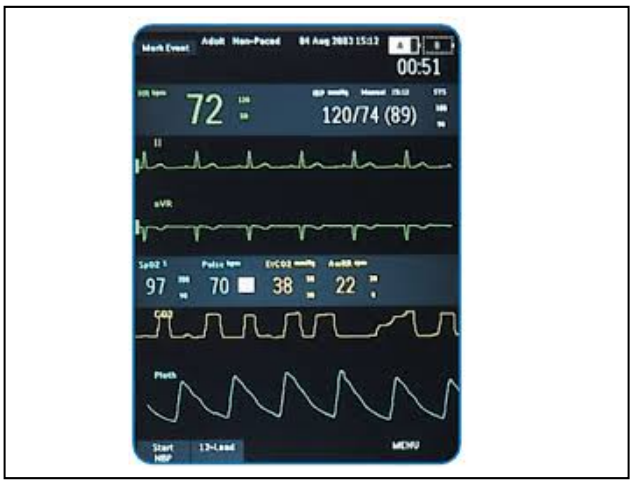
A. Intubation:
   1. Verifying ETT or iGel placement.
   2. Continuous monitoring and detection of tube dislodgment.
   3. Loss of circulatory function.
   4. Monitoring CPR:
      a. Effectiveness of cardiac compression.
      b. Earliest sign of ROSC (Return of Spontaneous Circulation).
      c. Predictor of survival.

II. EQUIPMENT:

A. Phillips MRX equipped with Capnography.
B. Intubated: FilterLine for adult and pediatric patients- connects between Ambu and ETT or iGel

III. PROCEDURE:

A. Connect appropriate FilterLine to MRX and allow for initialization (approx. 5 seconds). The $EtCO_2$ monitor performs the autozero routine as part of the initialization self-test.
B. MRX automatically defaults CO_2 waveform (capnogram) on channel 3 of the display. Verify that the CO_2 capnogram is displayed.
C. Adjust scale, if necessary. To change the CO_2 scale, select CO_2 and choose the desired scale from the scale overlay. There are three options available for the display scale:
   1. Autoscale (default: selects appropriate scale based on measured $EtCO_2$ value)
   2. 0-50 mmHg
   3. 0-100 mmHg.
D. Place the FilterLine on patient, or connect to airway device, and verify waveform.
E. The CO_2 level and capnogram should be monitored and documented with the patient's vital signs. Any loss of CO_2 detection or waveform indicates an airway problem and should be corrected immediately.
F. For intubated patients, record a capnographic waveform strip following any patient movement and before transferring care to determine that there has not been a tube dislodgment.



PROCEDURE GUIDELINE
CAPNOGRAPHY

IV. NOTES:

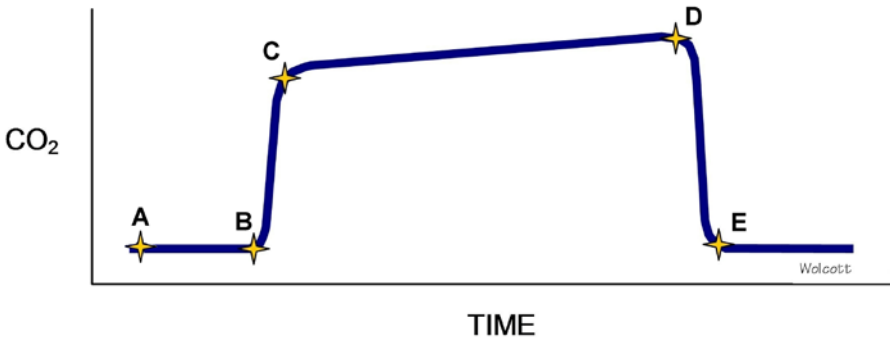
A. Connect the FilterLine tubing to the Phillips MRX Biphasic defibrillator/monitor first; then connect it to the patient's airway.

B. Capnography is more effective than pulse oximetry in the early detection of adverse respiratory events. The MRX will display 3 main items in reference to Capnography: Respiratory Rate, Capnogram (capnography waveform), and Carbon Dioxide measurements in mmHg.

1. Respiratory Rate: The MRX will display an objective average of the patient's respiratory rate or ventilation rate based upon the waveform width.

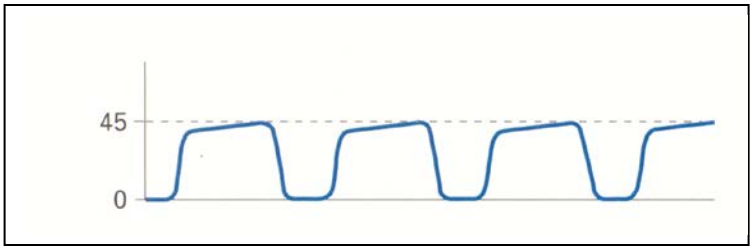
2. Capnogram:

a. Normal Capnogram:



A-B: Respiratory baseline- exhalation of CO_2-free gas contained in dead space.
B-C: Expiratory upslope- exhalation of mixed dead space and alveolar gas.
C-D: Alveolar plateau- exhalation of mostly alveolar gas.
D: End-tidal value- peak CO_2 concentration, normally at the end of exhalation.
D-E: Inhalation- rapid, sharp downstroke.

b. Normal Waveform:



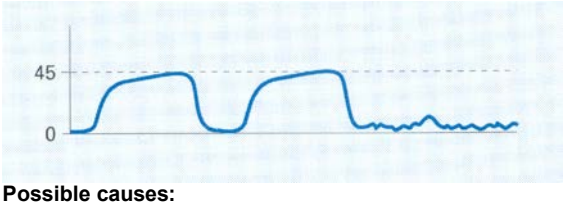
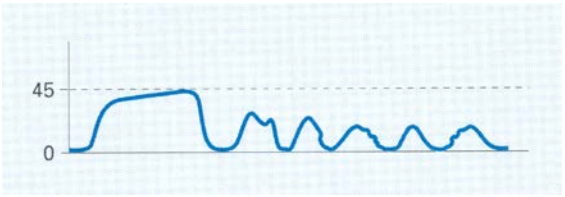
PROCEDURE GUIDELINE
CAPNOGRAPHY

3. Carbon Dioxide Measurements:
   a. Normal range is 35-45 mmHg.
   b. Values below 35 mmHg are indicative of respiratory alkalosis.
   c. Values greater than 45 mmHg are indicative of respiratory acidosis.
   d. Cardiopulmonary resuscitation is estimated to provide only 33% of normal cardiac output. Typical $EtCO_2$ values in cardiac arrest are 10-12 mmHg or
   e. 1/3that of normal $EtCO_2$ values.
   f. An $EtCO_2$ of zero following intubation indicates a displaced airway

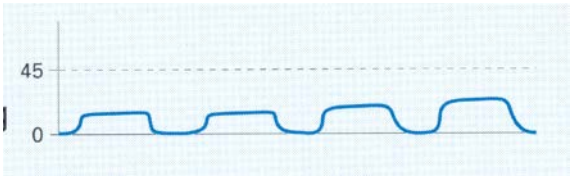
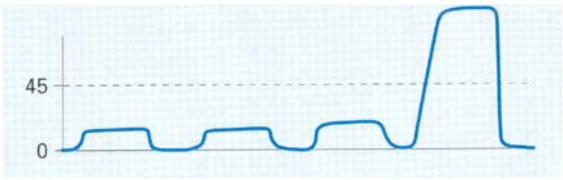
C. Alarms:
1. CO_2 FILTER LINE OFF message: the filterline is disconnected.
2. ALARM APNEA message: This alarm is on whenever $EtCO_2$ monitoring is in use and the device detects a valid breath. It is not controlled by the Phillips MRX defibrillator/monitor Quick Set feature. The APNEA alarm appears when no valid breath has been detected for 30 seconds. The message ALARM APNEA appears in the status region on the display along with the time since the last detected breath.
3. CO_2 FILTERLINE BLOCKAGE message: FilterLine is kinked or clogged with moisture. This message appears after 30 seconds of unsuccessful purging, or clearing of FilterLine. Check the FilterLine and if it is kinked, unkink it, then disconnect and reconnect the Filter line and it will start monitoring. If it doesn't start monitoring after disconnecting and reconnecting, assume the filter is saturated and change the FilterLine. Never blow out FilterLines!
4. CO_2 FILTERLINE PURGING message: FilterLine tube twisted or clogged, or a rapid altitude change occurred.

D. Troubleshooting tips:
1. $EtCO_2$ values are erratic: leak in the tubing or the ventilated patient breathes spontaneously.
2. $EtCO_2$ values are consistently higher or lower than expected: physiological cause, ventilator malfunction, or improper calibration.
3. XXX appears in place of $EtCO_2$ value: CO_2 module not calibrated successfully, or CO_2 module fails.

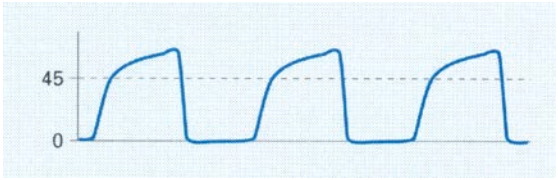
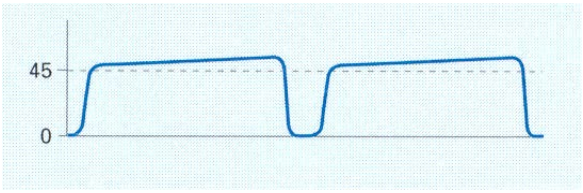
E. Abnormal Capnograms:
1. Intubated:

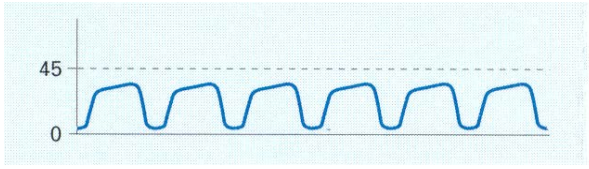
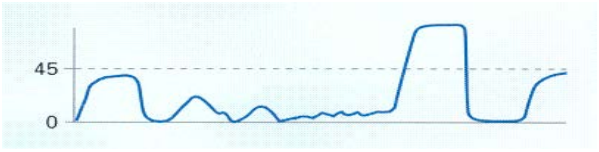
Sudden loss of waveform, $EtCO_2$ near zero	**Decreasing $EtCO_2$ with loss of plateau**
	
Possible causes: Airway disconnection Dislodged ET tube/esophageal intubation Totally obstructed/kinked ET tube Complete ventilator malfunction	**Possible Causes:** Leak in the airway system ET tube in hypopharynx ET tube cuff leak or deflated cuff Partial airway obstruction Partial disconnect from ventilator circuit

PROCEDURE GUIDELINE
CAPNOGRAPHY

CPR Assessment	Sudden increase in $EtCO_2$
	
Possible causes: Attempt to maintain minimum of 10-12 mmHg	**Possible causes:** Return of spontaneous circulation

2. Non-Intubated:

Plateau has curved, "shark-fin" appearance	Slow rate with increased $EtCO_2$
	
Possible causes: Brochospasm found in Asthma or COPD Incomplete exhalation Partially kinked ET tube Mucous plugging Poor sampling techniques	**Possible causes:** Hypoventilation Altered mental status (sedation, post-ictal states, drug or alcohol intoxication, head trauma, CVA) Partial airway obstruction Respiratory-depressant drugs

Rapid rate with decreased $EtCO_2$	Decreased $EtCO_2$, variable waveform
	
Possible causes: Hyperventilation Hypothermia Pulmonary embolism	**Possible causes:** Apnea, inadequate breath Sedation

PROCEDURE GUIDELINE
CARDIAC MONITOR

OPERATIONAL CHECKS EVERY MONDAY

QUICK LOOK METHOD

1. **Indications:**
   - In cardiac arrest for initial rhythm observation prior to application of Fast patch or 3 Lead Electrodes.
2. **Procedure:**
   - Remove clothing from patient's chest.
   - Apply Fast Patch pads:
     - ***Apply PAD and STERNUM wire*** *to upper sternum slightly toward right shoulder.*
     - ***Apply PAD and APEX wire*** *to the anterior (mid-axillary) line below the nipple.*
   - Ensure the monitor is in the PADDLES mode in the lead selection.

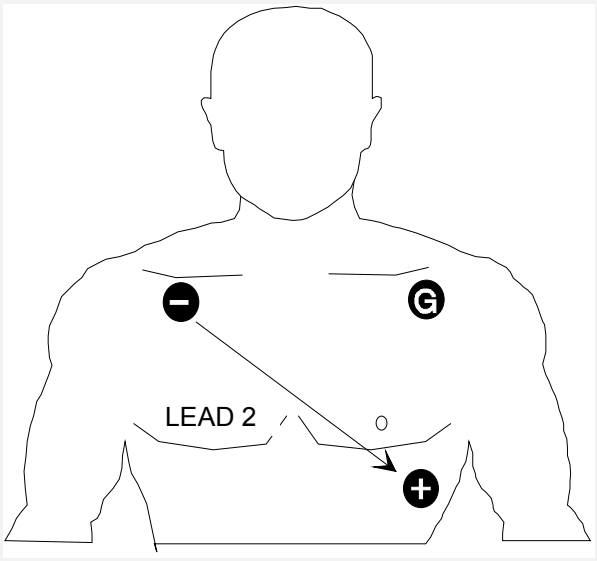
1. **Indications:**
   - Determination and monitoring of cardiac rhythms with anticipation of defibrillation.
2. **Procedure:**
   - Remove clothing from patient's chest.
   - Apply Fast Patch pads:
     - ***Apply PAD and STERNUM wire*** *to upper sternum slightly toward right shoulder.*
     - ***Apply PAD and APEX wire*** *to the anterior (mid-axillary) line below the nipple.*
   - Ensure the paddles are in FAST PATCH adapter with the paddles in the proper side.
   - Ensure the monitor is in the PADDLES mode in the lead selection.

THREE LEAD METHOD

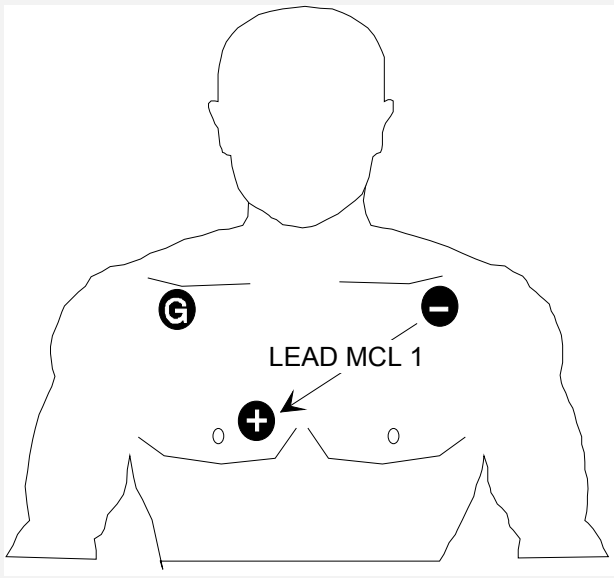
1. **Indications:**
   - Determination and monitoring of cardiac rhythms.

2. **Procedure:**
   - Remove clothing from area electrodes will be placed.
   - Apply wires to electrodes.

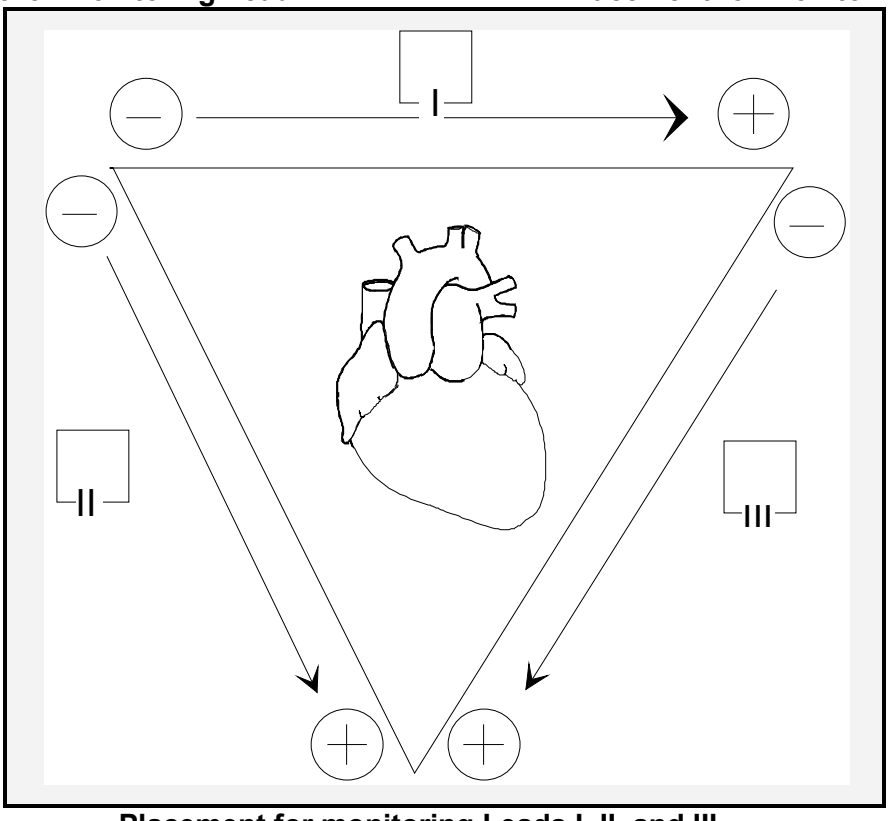
PROCEDURE GUIDELINE
CARDIAC MONITOR (CONTINUED)



Placement for monitoring Lead II



Placement for monitoring MCL I



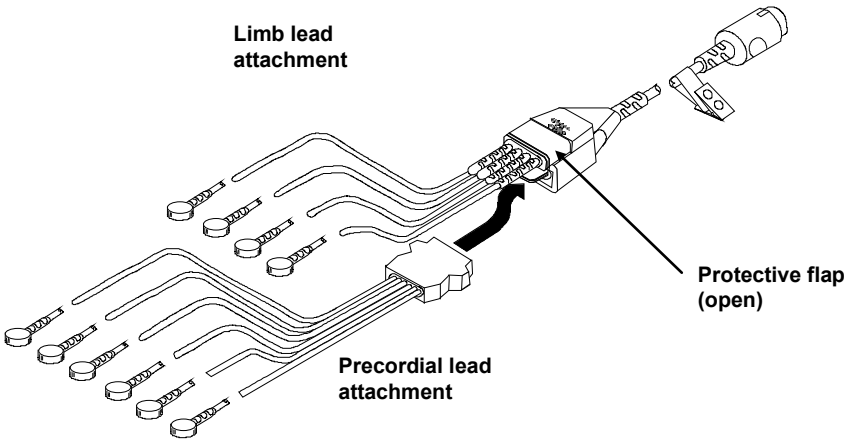
Placement for monitoring Leads I, II, and III

PROCEDURE GUIDELINE
CARDIAC MONITOR (CONTINUED)

The 12 lead ECG

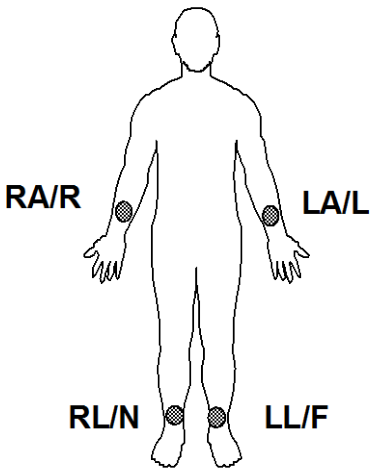
To acquire a 12-Lead ECG.

Insert the limb lead and the precordial lead attachment into the main cable as shown below:



Limb Lead Electrode Sites

When acquiring a 12-Lead ECG, the limb lead electrodes are typically placed on the wrists and the ankles as illustrated below. In fact the limb lead electrodes can be placed anywhere along the limbs. However, do not place the leads on the torso when acquiring a 12-Lead ECG or you will record a non-standard report.

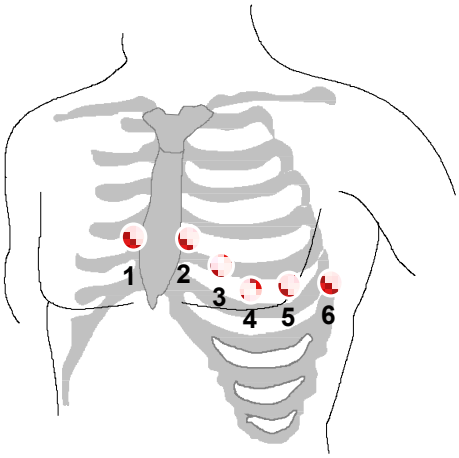


AHA	Labels		IEC	Labels
RA	Right Arm		**R**	Right
LA	Left Arm		**L**	Left
RL	Right Leg		**N**	Negative
LL	Left Leg		**F**	Foot

PROCEDURE GUIDELINE
CARDIAC MONITOR (CONTINUED)

Limb Lead Electrode Sites continued

The six precordial (chest) leads are placed on specific locations on the chest. Proper placement is important for accurate diagnosis and should be identified as shown below:



Lead	Location
V1	Fourth intercostal space to the right of the sternum
V2	Fourth intercostal space to the left of the sternum.
V3	Directly between leads V2 and V4.
V4	Fifth intercostal space at midclavicular line.
V5	Level withV4 at left anterior axillary line.
V6	Level with V5 at left midaxillary line. (Midpoint of armpit).

Locating the V1 position (fourth intercostal space) is critically important because it is the reference point for locating the placement of the remaining V leads. To locate the V1 position:

1. Place your finger at the notch in the top of the sternum.
2. Move your finger slowly downward about 1.5 inches until you feel a slight horizontal ridge or elevation. This is the “angle of Louis” where the manubrium joins the body of the sternum.
3. Locate the second intercostal space on the right side, lateral to and just below the angle of Louis.
4. Move your finger down two more intercostal spaces to the fourth intercostal space which is the V1 position.

Other important considerations:

- When placing electrodes on female patients, always place leads V3 - V6 ***under*** the breast rather than ***on*** the breast.
- Never use the nipples as reference points for locating the electrodes for men or women patients because nipple locations may vary widely.

The monitor acquires 10 seconds of ECG data for each 12-Lead ECG requested. If the monitor detects signal noise while acquiring data (such as patient movement or disconnected electrode), the monitor displays the message WAITING FOR GOOD DATA.

PROCEDURE GUIDELINE
CARDIOVERSION

1. **Indications:**
   - NARROW COMPLEX TACHYCARDIA PROTOCOL.
   - VENTRICULAR TACHYCARDIA WITH A PULSE PROTOCOL.

   If the patient presents with one or more unstable criteria, (significant discomfort of suspected cardiac origin, severe dyspnea, altered mental status, or hypotension with signs of decreased tissue perfusion), ***DEFIBRILLATION*** may be administered at the same joule setting listed in the PROTOCOL to avoid delays associated with Synchronization.
   - Symptomatic Atrial Fibrillation / Atrial Flutter with RVR.

2. **Check the equipment** - Turn on the monitor / defibrillator.

3. **Apply monitor per PROCEDURE GUIDELINE.**

4. **Verify function of synchronizer button.**
   - QRS complex must be upright on monitor - inverted or low amplitude complexes may not trigger synchronizing circuit. Turn up machine gain until a small dot appears on the QRS complex. This indicates that the synchronizer circuit has been activated.

5. **Confirm the rhythm.**

6. **Cardioversion:**
   - Confirm the rhythm.
   - Ensure synchronizer is turned on and activate synchronizer.
   - Check fast patch pads position and conduction.
   - Select appropriate energy level per Standing Order.
   - Stop CPR and call ALL CLEAR. Check to ensure all people including you are clear of the patient. Ensure ALL personnel are in a safe operating location.
   - Discharge energy by pressing discharge buttons simultaneously and hold until energy is delivered. Machine will not deliver energy until the proper time.
   - **Observe for rhythm change and check the patient for a pulse, (If applicable).**
   - Repeat as necessary per PROTOCOL.

PROCEDURE GUIDELINE
CHILD BIRTH

Clinical Indications:

- Imminent delivery with crowning

Procedure:

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.

2. Support the infant's head as needed.

3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.

4. Suction the airway with a bulb syringe.

5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder

6. Gently pull up on the head to allow delivery of the posterior shoulder.

7. Slowly deliver the remainder of the infant.

8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.

9. Record APGAR scores at 1 and 5 minutes.

10. Follow the **New Born Protocol** for further treatment.

11. The placenta will deliver spontaneously, usually within 5-10 minutes of the infant. Do not force the placenta to deliver.

12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.

13. Continue rapid transport to the hospital.

PROCEDURE GUIDELINE
CPAP

CPAP is defined as the application of positive end expiratory pressure by facemask for relief of hypoxemia, which doesn't respond to conventional therapy. In order for CPAP to be used, the patient must be breathing.

A. **INDICATIONS:** Hypoxemia secondary to COPD or Pulmonary Edema.

B. **CONTRAINDICATIONS:**
1. Penetrating chest trauma
2. Severe hypotension
3. Persistent nausea and or vomiting
4. Obtundation
5. Respiratory / Cardiac arrest
6. Patient unable to protect their own airway

C. **PROCEDURE:**
1. Do not bypass, delay or withhold conventional treatment while assembling or using the CPAP device.
2. Choose appropriate setting: PEEP valve- 5-7.5 cm for COPD or 10 cm for Pulmonary Edema.
3. Assemble the equipment as per **Figure 1**.
4. Explain the procedure to the patient to help alleviate any anxiety.
5. Test the equipment prior to placing on the patient.
6. Make sure the on / off valve is in the **off** position.
7. Ensure the flow adjustment valve is open completely and the oxygen adjustment valve is in the lowest flow position.
8. Turn the on / off valve to the **on** position.
9. Secure the mask to the face of the patient using the least amount of pressure to make a seal.
10. Watch the PEEP valve to ensure that it remains open during inspiration.
11. Decrease the flow adjustment valve until there is slight continuous flow from the PEEP valve during inspiration.
12. Monitor the patient's condition for improvement, including the respiratory rate, mental status and SaO2 percentage.
    A. If the patient's condition is improving, continue to monitor the patient.
    B. If the patient's condition is not improving, increase the oxygen adjustment valve. Titrate in increments of ½ turns q 2 minutes to SaO2 of 100%.
    C. If the patient's condition is deteriorating despite increasing the oxygen adjustment valve, discontinue the CPAP device and prepare for orotracheal intubation.

PROCEDURE GUIDELINE
CPAP (CONTINUED)

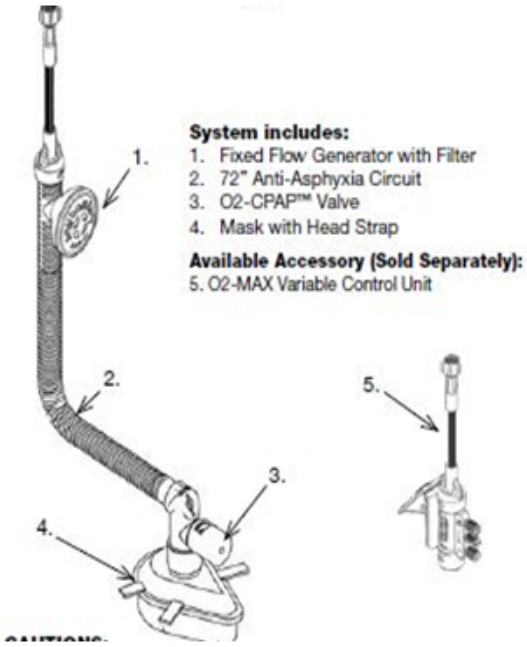


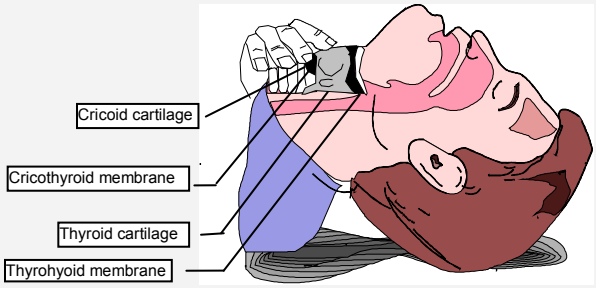
Figure 1

PROCEDURE GUIDELINE
CRICOTHYROTOMY- NEEDLE

1. **Indications:**
   - If unable to ventilate and airway **not patent**, perform Needle Cricothyrotomy, as listed on page 2-49 in the PROTOCOLS.
   - Preferred over surgical cricothyrotomy in children under 12 years old.
   - Preferred over surgical cricothyrotomy in patients with known clotting disorders and/or anticoagulant therapy.
2. **Equipment:**
   - 14 gauge over the needle catheter.
   - 3.0 mm endotracheal tube adapter.
   - Antiseptic swabs.
   - 10 cc syringe.
   - Tape.
   - Occlusive dressing.
   - BVM.
3. **Procedure** (refer to illustration):
   - Place the patient in a supine position with the neck in a neutral position.
   - Gather and prepare equipment.
   - Prepare site with Antiseptic swabs.
   - Palpate the cricothyroid membrane, anteriorly, between the thyroid cartilage and cricoid cartilage. Stabilize the trachea with the thumb and forefinger of one hand. Stretch skin taut.
   - Puncture the skin midline with the needle attached to the syringe, directly over the cricothyroid membrane.
   - Direct the needle at a 45 degree angle caudally, while applying negative pressure to the syringe.
   - Carefully insert the needle through the lower half of the cricothyroid membrane, aspirating as the needle is advanced.
   - Aspiration of air signifies entry into the tracheal lumen.
   - Remove the syringe and withdraw the needle while gently advancing the catheter downward into position, being careful not to perforate the posterior wall of the trachea.
   - Attach 3.0 mm ET adapter to hub of catheter, connect BVM and ventilate while manually stabilizing catheter.
   - Observe breath sounds and auscultate the chest for adequate ventilation.
   - Secure the catheter to the patient's neck with tape (chevron) after area prepped with benzoin.
   - Continue to ventilate and observe chest rise.

PROCEDURE GUIDELINE
CRICOTHYROTOMY- NEEDLE (CONTINUED)

1

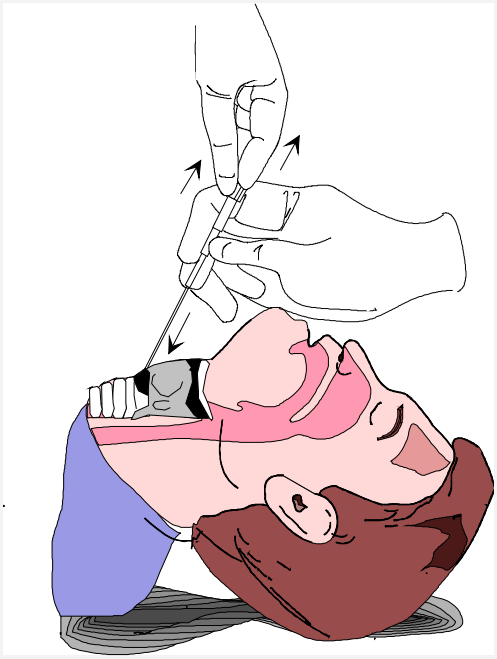


Palpate the cricothyroid membrane, anteriorly, between the thyroid cartilage and cricoid cartilage.

2

Puncture the skin directing the needle at a 45 degree angle caudally.

3



Remove needle from catheter.

4

Gently advance catheter downward into position.

PROCEDURE GUIDELINE
CRICOTHYROTOMY- SURGICAL

1. **Indications:**
   - If unable to ventilate and airway **not patent**, perform Cricothyrotomy.
   - When an airway is needed and intubation is unsuccessful.
2. **Contraindications:**
   - Children under 12 years old.
   - Known bleeding disorder and/or anticoagulant therapy.
   - Unable to locate landmarks.
3. **Equipment**:
   - #10 or 11 size scalpel blade with handle.
   - Needle nose hemostats.
   - 5.0 to 7.0 mm endotracheal tube, cut above pilot balloon.
   - Antiseptic swabs.
   - Tape.
   - BVM.

3. **Procedure**

a. Place the patient in a supine position with the neck in a neutral position.

b. Palpate the thyroid notch, cricothyroid membrane, and the sternal notch for orientation. Gather equipment.

c. Prepare site with Antiseptic swabs.

d. Stabilize the thyroid cartilage with thumb and 3rd finger of hand. Stretch skin taut.

e. Orient yourself thoroughly with the anatomical landmarks by grasping the larynx with your thumb and middle finger. Using your index finger, first locate the Laryngeal prominence (point of the Adams apple) and then slide your finger caudally (toward the feet) to the cricothyroid membrane (the V notch just superior to the Cricoid cartilage).

f. Stabilize the thyroid cartilage with your non-dominant hand. If you lose the midline, the anatomy will be distorted and you may find that you have cut muscles and/or blood vessels on either side of the trachea.

PROCEDURE GUIDELINE
CRICOTHYROTOMY- SURGICAL

h. Using a number 10 or 11 scalpel blade, make a vertical incision from the superior border of the thyroid cartilage, caudally about 3-cm to just above the sternal notch. (A vertical incision promotes dissection in the midline and rapid identification of the structures.) Try to cut through the skin and subcutaneous tissue in one clean stroke. There will be some brisk bleeding. Sponge it if necessary, but don't waste much time trying to stop it.

i. With your index finger, locate and feel the cricothyroid membrane. Carefully make a transverse (horizontal) incision through the cricothyroid membrane about the width of the cricothyroid space. If the patient is breathing spontaneously, secretions, blood, and air will spray out of the opening. Protect yourself.

j. Insert the scalpel handle into the incision (use caution) and rotate it 90 degrees to open the airway or insert hemostats to enlarge the opening for passage of the ET tube.

k. Insert a cuffed endotracheal tube (5.0 to 7.0 mm) into the cricothyroid membrane incision directing the tube caudally (toward the feet) into the trachea. Inflate the cuff and ventilate the patient with a BVM connected to oxygen.

l. Observe the chest rise and fall; auscultate the lungs and stomach to ensure proper tube placement. Secure the endotracheal tube, and continue to monitor the patient.

PROCEDURE GUIDELINE
DEFIBRILLATION- ADULT

1. **Indications:**
   - Ventricular Fibrillation
   - Pulseless Ventricular Tachycardia

2. **Check the equipment** - Turn on the monitor / defibrillator.

3. **Apply monitor per Procedure Guideline.**

4. **Confirm the rhythm.**

5. **Defibrillation:**

   Confirm the patient is unresponsive and pulseless.
   - Ensure synchronizer is turned **off**.
   - Check fast patch pads position and conduction.
   - Select appropriate energy level per Standing Order.
   - Stop CPR and call ALL CLEAR. Check to ensure all people including you are clear of the patient. Ensure ALL personnel are in a safe operating location.
   - Discharge energy by pressing shock button.
   - Observe for rhythm change and check the patient for a pulse, (If applicable).
   - Repeat per PROTOCOL

PROCEDURE GUIDELINE
DEFIBRILLATION- PEDIATRIC

1. **Rhythms to defibrillate:**
   - Ventricular Fibrillation and Pulseless Ventricular Tachycardia:
     - *First Defibrillation:* *2 J per kilogram.*
     - *Second Defibrillation:* *4 J per kilogram.*
     - *Third and Continuous Defibrillation:* *4 J per kilogram.*

2. **Check the equipment:**
   - Turn on the monitor / defibrillator.
   - Apply appropriate size pads. Use the largest pad surface which makes complete contact with the patient. Entire pad should make complete contact with patient.

3. **Defibrillation:**
   - Confirm the patient is unresponsive and pulseless.
   - Ensure synchronizer is turned **off**.
   - Position pads
   - Stop CPR and call **ALL CLEAR**. Check to ensure all people, including you, are clear of the patient. Ensure ALL personnel are in a safe operating location.
   - Discharge energy by pressing shock button.
   - Observe for rhythm change and check the patient for a pulse, (if applicable).
   - Repeat per PROTOCOL

PROCEDURE GUIDELINES

DIFFICULT AIRWAY- FACILITATED INTUBATION

I. INDICATIONS:

Indicated for adult and pediatric patients where ventilatory support and facilitated intubation and are required, to include both medical and trauma conditions. This procedure guideline should be used as a replacement for those situations where Midazolam (Versed) was indicated for airway management. These situations include, but are not limited to:

A. Trauma patients with Glasgow Coma Scale of 8 or less with gag reflex.
B. Trauma patients with significant facial trauma and poor airway control.
C. Closed head injury or major stroke with unconsciousness.
D. Burn patients with airway involvement and inevitable airway loss.
E. Respiratory exhaustion such as severe asthma, CHF or COPD with hypoxia.
F. Overdoses with altered mental status where loss of airway is inevitable.
G. Status Epileptic
H. Carbon Monoxide Poisoning

II. GENERAL PROCEDURE:

A. This is not a one-person procedure. Assistance should be utilized to facilitate the best possible patient care. For trauma patients, use a second crewmember to maintain in-line c-spine at all times

B. **Basic Life Support** procedures should always occur concurrently with the initial assessment of any patient with the potential of hypoxia. These should include oxygen (NRB or BVM), manual jaw thrust, use of nasal and oral airways, adequate suctioning, etc. For those patients requiring BVM ventilation, an adequate seal, along with Sellick's Maneuver, is imperative to provide adequate ventilation and reduce the occurrence of gastric distention.

C. Always **pre-oxygenate** for a ***minimum*** of 1 full minute with 100% oxygen, being careful not to hyperventilate at an excessive rate or force. (**Severe *incidental hypoxia*** has been noted, in several studies, to occur during intubation attempts if pre-oxygenation is not accomplished effectively.)

- If the patient is **NOT** spontaneously breathing or is breathing ineffectively, provide ventilatory support using a BVM with 100% oxygen at a rate of 10-12 breaths per minute.
- If the patient is spontaneously breathing and breathing effectively, provide blow-by 100% oxygen via NRB without overriding patient's ventilations, thereby reducing the risk of gastric distention.

D. Gather and test all necessary equipment prior to the initial attempt. Prepare the cardiac monitor for capnography by attaching the $EtCO_2$ FilterLine (see CAPNOGRAPHY PROCEDURE GUIDELINE).

E. Intubation attempts should not be initiated without cardiac and SpO_2 monitoring in place, unless circumstances exist that preclude monitoring (very rare). A second crewmember should read and announce out loud the patient's heart rate and SPO_2 continuously during intubation attempts.

F. Attempt to open the mouth by scissors (thumb and forefinger) technique. Proceed with intubation as outlined in the INTUBATION- OROTRACHEAL PROCEDURE GUIDELINE.

G. If sedation is necessary to facilitate intubation (intact gag reflex, unable to open the mouth due to trauma, if the jaw is clenched, etc.) return to BLS procedures and:

- Ensure best oxygenation and ventilation.
- Ensure a ***patent*** IV line exists.
- If MAP > 70, administer 5 mg **Versed** IV Push over 30-60 seconds for ***sedation*** along with 2mg/kg Ideal Body weight of Ketamine (Maximum dose of 200 mg). If MAP < 70, skip Versed and proceed only with Ketamine.
- Wait 1 to 2 minutes and assess for adequate sedation for intubation. If patient adequately sedated, proceed with intubation
- Attempt a **maximum** of **2** times to pass endotracheal tube through the vocal cords.
- During intubation attempt, monitor for signs of hypoxia (significant decrease in HR, SpO_2 levels below 90%, signs of ventricular ectopy, etc.). If hypoxia develops, stop all procedures and immediately ventilate the patient with 100% oxygen (**re-oxygenate**).
- If after Ketamine and/or Versed administration, sedation not achieved proceed with **Succinylnocholine** administration.
- **Paramedic must be present** on scene prior to **Succinylnocholine** administration.
- Due to rapid onset of **Succinylnocholine** make sure that all equipment necessary has been prepared prior to intubation attempt.
- Apply cricoid pressure and hold until patient has been intubated, balloon of ETT has been inflated, position of tube tip has been assured, and ETT has been secured in place. Administer **Succynocholine** 1mg/kg IVP (**Max. 100mg**) and wait for paralysis to occur.
- Intubate **(Two Attempts)**. Discontinue attempt and ventilate with 100% O2 if:
    1. a. Thirty seconds has passed, and PO2 falls below 90% or
    2. b. Heart rate falls below 60.
- Following intubation, confirm proper tube placement by auscultating the gastric area and the lungs bilaterally. Attach the $EtCO_2$ FilterLine hub to the endotracheal tube hub. Ventilate the patient with a BVM and watch for appropriate capnographic waveforms with each BVM ventilation. Record a monitor strip as capnographic verification of appropriate endotracheal tube placement.
- If intubation successful, progress to section III: SUCCESSFUL AIRWAY SECTION.
- If unable to intubate after **Succynocholine,** progress to Section IV: FAILED AIRWAY SECTION.

III. SUCCESSFUL AIRWAY SECTION:

A. **Continuously monitor airway status** to maintain intubation, adequate ventilation and adequate perfusion. Continue to monitor the capnographic waveforms throughout ventilations to confirm appropriate tube placement. Following any movement of the intubated patient to include at transfer of care, record a capnographic waveform strip to determine that there has not been ET tube dislodgment.

B. If necessary to maintain sedation post-intubation and BP > or = 100 mmHg systolic, administer **Versed** in 2-mg increments IVP every 3-5 minutes (maximum total dosage is 10 mg). **Valium** may be substituted for Versed in 5 mg increments **Slow** IVP every 3-5 minutes (maximum total dosage is 20 mg).

DIFFICULT AIRWAY- FACILITATED INTUBATION

IV. FAILED AIRWAY SECTION:

A. Revert to **Basic Life Support** airway procedures ensuring adequate ventilation and oxygenation with 100% oxygen.

B. Keep the airway clear of secretions, blood and vomitus.

C. If able to effectively ventilate the patient with a BVM, consider insertion of an **iGel AIRWAY** and continue ventilations (refer to the iGel AIRWAY PROCEDURE GUIDELINE).

D. If attempts at ventilation fail, or ventilations fail to perfuse the patient with oxygen, immediately perform a **Cricothyrotomy** (refer to the CRICOTHYROTOMY- NEEDLE or SURGICAL PROCEDURE GUIDELINE).

PROCEDURE GUIDELINE

DAILY CONTROLLED SUBSTANCES PROCEDURE AND POLICY

CONTROLLED SUBSTANCES INVENTORY/KEY SECURITY

1. Controlled substances are assigned to individual ALS licensed vehicles. All controlled substances will be inventoried, the Controlled Substance Usage Form's (CSUF'S) will be reviewed for completion & accuracy, & Controlled Substance Daily Inventory Logs will be reviewed for completion & accuracy by the ON COMING and OFF going paramedic at the following times:

A. Every AM at shift change

B. When a paramedic is relieved during a shift by another paramedic

2. It will be both paramedic employees responsibility, when checking the controlled substances that each individual package will be picked up, the expiration date checked and each item thoroughly inspected for color, clarity, tampering, or seal breakage. The date, time, count of each substance and the signatures of both ON COMING and OFF GOING paramedics will be entered on the CONTROLLED SUBSTANCE DAILY INVENTORY LOG that is to be kept with the substances in the locked compartment of the ALS licensed vehicle. Expiring substances, suspected tampering, seal breakage, incomplete/inaccurate paperwork, or discrepancies/errors of any nature will be reported to Medical Supervision immediately by phone and county e-mail.

3. When changing or trading ALS licensed vehicles, the paramedic will be responsible to ensure that the controlled substances and the associated paperwork are secured in the locked compartment of the ALS licensed vehicle that he/she will be using.

4. The key to the locked drug cabinet in the ALS licensed vehicle and/or the key to the locked cash box containing the substances will be kept by the ON DUTY paramedic, on his/her person at all times when working. Individual access codes and/or proximity cards to the locked drug cabinet shall remain secured and confidential at all times. If a proximity card is lost/misplaced/stolen immediate notification shall be made to Medical Supervision by phone and county e-mail and to the I.T. System Administrator by county e-mail.

DISCREPENCIES/SEAL BREAKAGE

1. If at any time when controlled substances are inventoried, there is a discrepancy between the count and what is documented on the CSUF or the controlled substance daily inventory log, there is suspected tampering or a Safety Seal found broken or loose, it is both paramedics' responsibility to report such discoveries to Medical Supervision immediately by phone and county e-mail. Both paramedics will remain at the station until permitted to leave by Medical Supervision.

2. If in anticipation of administration, the tamper or safety seal on any substance is broken, the paramedic, before leaving the hospital, is to waste the entire substance in the presence of an RN and document this waste on the CSUF. The paramedic is also responsible for documenting on the ePCR circumstances surrounding the non-administration of a drug.

ADMINISTRATION/DOCUMENTATION

1. Controlled Substances may be administered by standing orders or by physician orders. Paramedics are responsible for knowing what controlled substance requires a physician order and what controlled substance may be given without physician order as outlined in the System Treatment Protocols.

2. The CSUF will be the legally recognized record that will accurately and completely reflect all controlled substance administration and waste documentation. There is one CSUF Issued for each substance or concentration of substance carried on the ALS licensed vehicle. Each vial, syringe, or other supplied forms of controlled substances when administered, wasted, broken or removed from the ALS licensed vehicle is to be accounted for on a separately numbered line on the CSUF. The CSUF will be kept in the locked cash box inside the locked drug compartment of the ALS licensed vehicle.

3. The Paramedic that administers or attempts to administer a controlled substance is responsible for the proper completion of the CSUF before leaving the receiving facility or scene of a call if the patient was not transported by their unit. An entry into each field is mandatory either by entering the necessary information or N/A (Not applicable). If the ordering physician signature is unobtainable, write "UTO" on the physician signature line on the CSUF, and document the reason(s) why the signature was not obtained on the ePCR.

PROCEDURE GUIDELINE
DAILY CONTROLLED SUBSTANCES PROCEDURE AND POLICY (CONTINUED)

4. In cases where the Paramedic administers a controlled substance or breaks the tamper or safety seal in anticipation of administration, and then turns patient care over to another unit/agency, the RN Waste signature for the waste amount may be obtained from a Medical Supervisor, a Medical Training Officer, a Battalion Chief with Paramedic Credentials, a Flight Medic/RN or a Paramedic from another unit. (Waste signatures outside of the hospital setting as described above must not be obtained from anyone within the same unit or station)

5. Under no circumstances are any EMT's, Paramedic students, Provisional Paramedics or Paramedic's not working under the license of the Polk County Fire Rescue Medical Director allowed to administer any controlled substance to any patient.

RESUPPLY/REMOVAL/MONTHLY INVENTORY/VIOLATIONS

1. When a controlled substance inventory is reduced to three (3) each of a substance for transport units & two (2) each for non-transport units, resupply may be indicated. The on-duty Paramedic must contact Medical Supervision by phone and county e-mail to advise them of the current inventory. Medical Supervision will make arrangements for resupply of that particular substance.

2. If a controlled substance is nearing the expiration date, the on-duty Paramedic must contact Medical Supervision at least one (1) week prior to the expiration date by phone and county e-mail to advise them of the upcoming expiration.

3. If a controlled substance has expired and has not been removed from the ALS unit by Medical Supervision the on-duty Paramedic will be responsible for contacting Medical Supervision by phone & county e-mail each shift until the controlled substance has been removed and/or restocked.

4. Any expired controlled substance shall be placed in a clear bag, sealed & clearly labeled on the outside of the bag as expired so as to eliminate incidental administration, and shall remain in the locked cash box inside the locked cabinet of the ALS Licensed vehicle to which it was assigned until removed and/or restocked by Medical Supervision.

5. Completion and/or submission of the electronic monthly drug inventory does not alleviate any on duty Paramedic from their responsibility of making notification of expiring controlled substances as outlined above.

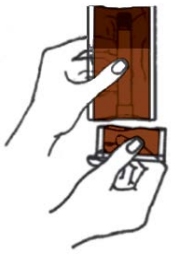
6. Only Paramedic Credentialed employees authorized by the Medical Director and trained in proper procedures may be directly involved in removal, restock or inspection of any controlled substances.

7. Controlled substance handling, dispensing, storing, ordering and disposal are regulated by DEA Title 21, FS 499, FS 893, & FAC 64J. The Medical Director is responsible for establishing and enforcing as necessary all Protocols, Policies and/or procedures as related to controlled substances. An employee violating in any form the Polk County Fire Rescue Protocols, Policies and/or Procedures relating to controlled substances may be subject to removal of their privilege to work under the license of the Medical Director and may be subject to payment of any fines and/or penalties levied as a result of said violations.

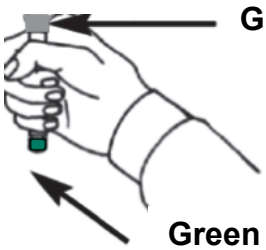
PROCEDURE GUIDELINE
DuoDote

IMPORTANT: Do Not Remove Gray Safety Release until ready to use.
CAUTION: Never touch the Green Tip (Needle End)!

1. **Tear open the plastic pouch at any of the notches. Remove the DuoDote Auto-Injector from the pouch.**



2. **Place the DuoDote Auto-injector in your dominant hand. (If you are right-handed, your right hand is dominant.) Firmly grasp the center of the DuoDote Auto-Injector with the Green Tip (needle end) pointing down.**



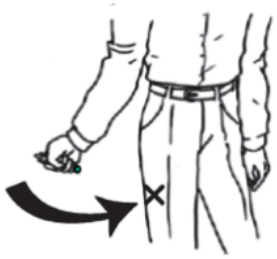
3. **With your other hand, pull off the Gray Safety Release. The DuoDote Auto-Injector is now ready to be administered.**

Gray Safety Release

PROCEDURE GUIDELINE
DuoDote

4. **The injection site is the mid-outer thigh area. The DuoDote Auto-Injector can inject through clothing. However, make sure pockets at the injection site are empty.**

Self Aid **Emergency Personnel Aid**



5. **Swing and firmly push the Green Tip straight down (a 90 degree angle) against the mid-outer thigh. Continue to firmly push until you feel the DuoDote Auto-Injector trigger**.

IMPORTANT: After the auto-injector triggers, hold the DUODOTE Auto-Injector firmly in place against the injection site for approximately 10 seconds.

6. **Remove the DuoDote Auto-Injector from the thigh and look at the Green Tip. If the needle is visible, the drug has been administered. If the needle is not visible, check to be sure the Gray Safety Release has been removed, and then repeat above steps beginning with Step 4, but push harder in Step 5.**

Needle Visible

Needle Not Visible

7. **After the drug has been administered, push the needle against a hard surface to bend the needle back against the DuoDote auto-Injector**.

8. **Put the used DuoDote AUTO-Injector back into the plastic pouch, if available. Leave used DuoDote Auto-Injector(s) with the patient to allow other medical personnel to see the number of DuoDote Auto-Injector(s) administered.**

9. **Immediately move yourself and the patient away from the contaminated area and seek definitive medical care for the patient.**

PROCEDURE GUIDELINE
EXTERNAL JUGULAR

1. **Equipment:**

- *IV solution.*
- *Micro drip, macro drip, blood set tubing.*
- *# 14 - #24 catheter over the needle.*
- *Alcohol Prep*
- *Gauze pad or adhesive bandage.*
- *Tape and / or veniguard.*

2. **Assemble the equipment:**

- Open IV bag for clarity, expiration date, etc.
- Examine the IV bag envelope at the edge where it is notched.
- Read the name of the solution.
- Open IV tubing.
- Close control valve below the drip chamber.
- Insert IV tubing in the IV solution bag port.
- Squeeze the drip chamber until the drip chamber is half full of solution.
- Uncap distal end of tubing and hold the cap so it does not become contaminated.
- Open the IV tubing valve to allow the solution to flow through until all bubbles are out of the tubing.
- Close the tubing valve and recap the distal end of the tube.

3. **Insertion:**

- Explain to the patient (if conscious) that an IV is going to be started in the neck region.
- Palpate veins for resilience. It may be necessary to turn the patient's head to one side or the other (if not contraindicated)
- Clean the skin with the antiseptic swab in an increasing sized concentric circle and follow it with an alcohol swab.
- Stabilize the vein distally with the Paramedic's thumb/fingers.
- Enter the skin with the bevel of the needle facing upward.
- Enter the vein, obtain a flashback, and advance the catheter off of the catheter over the needle and remove the needle (lock protective needle cover before removing the needle) while compressing the proximal tip of the catheter to minimize blood loss.
- Connect IV tubing to the catheter.
- Open the IV clamp to assure free flow.
- Set IV infusion rate.

PROCEDURE GUIDELINE
EXTERNAL JUGULAR (CONTINUED)

3. **Secure:**

   - Tape or veiniguard over the insertion site of the skin.
   - Secure the IV catheter and tubing with tape.
   - Recheck IV drip rate to make sure it is flowing at appropriate rate.

4. **Troubleshooting the IV**, (if the IV is not working well):

   - Check the IV insertion site for swelling.
   - Check the IV tubing clamp to make sure it is open.
   - Check the drip chamber to make sure it is half full.
   - Lower the IV bag below IV site and watch for blood to return into the tubing.

REMINDER: Unilateral procedure only.

PROCEDURE GUIDELINES

INTRAOSSEOUS INFUSION

ADVANCED CARE PROCEDURE

I. INDICATIONS:

A. Cardiopulmonary arrest for first line medication administration and fluid resuscitation where IV access is unavailable or easily obtainable.

B. Unstable patient (Medical or Trauma) presenting with definitive shock symptoms whose condition has the potential to rapidly deteriorate into cardiopulmonary arrest. IO access should be instituted if IV access is unavailable or unobtainable (after 2 attempts) for ***fluid resuscitation and subsequent medication administration.***

II. CONTRAINDICATIONS:

A. Ability to obtain IV access by another route (peripheral or external jugular).
B. Fracture or burns of the tibia or femur (tibial site), fracture of the humerus (humeral site).
C. Previous orthopedic procedures at or proximal to insertion site.
D. Infection or burn at the insertion site.
E. Inability to locate landmarks or excessive tissue over the insertion site.
F. Known congenital defect of the involved bone.
G. Known bone pathology (cancer or osteoporosis).

III. EQUIPMENT:

A. EZ-IO Drill.
B. EZ-IO Intraosseous needle:
   1. EZ-IO PD- indicated for patients 3-39 kg.
   2. EZ-IO AD- indicated for patients $\geq$ 40 kg.
C. EZ-Connect IV extension set.
D. Yellow instructional wrist band.
E. Appropriate IV tubing and IV fluid.
   1. Pediatric: Micro tubing (60 gtts/ml).
   2. Adult: Macro tubing (10 gtts/ml).
F. Betadine and alcohol prep pads.
G. Pre-filled 10 ml of Normal Saline.
H. Ketamine (Subanesthetic dose, if needed).

IV. PROCEDURE:

A. Always observe body substance isolation procedures and aseptic technique.
B. Set up IV solution checking for clarity and expiration date. Clear air from tubing.
C. Assure that there are no contraindications present.
D. **Insertion sites**:
   1. Locate the desired site. If you can't identify landmarks, choose an alternate site:
   2. **Pediatric** (3-39 kg):
      a. **Proximal tibia** *(primary)*: Locate the patella and the tibial tuberosity. The needle will be inserted 1 cm width below the tibial tuberosity on the medial aspect of the tibia (flat area or tibial plateau). If the tibial tuberosity is not prominent, locate the patella and the needle will be inserted 2 fingers width below the patella on the tibial plateau (see Figure 1).
      b. **Distal tibia** *(alternate)*: Locate the medial malleolus. The insertion site will be 1 finger width above the medial malleolus (see Figure 2).
   3. **Adult** (40 kg and above):
      a. **Proximal tibia** *(alternate)*: Locate the patella and the tibial tuberosity. The needle will be inserted 1 cm width below the tibial tuberosity on the medial aspect of the tibia (flat area or tibial plateau) (see Figure 3).
      b. **Distal tibia** *(alternate)*: Locate the medial malleolus. The insertion site will be 2 fingers width above the prominent portion of the medial malleolus (see Figure 2).
      c. **Proximal humerus** *(**primary**- no access or fractures to lower extremities)*: orient the arm at the patient's side, firmly adducted, with the forearm flexed across the umbilicus (elbow placed posterior). Locate the greater tubercle of the humerus. The needle will be inserted slightly anterior to the arms lateral midline and perpendicular to the bone at 90 degrees (see Figure 4).

E. **Preparation**:
1. Clean the skin with the Betadine swab in an increasing sized concentric circle and follow it with an alcohol swab.
2. Prepare the EZ-IO driver and needle set. The needle is sterile and should remain sterile during the procedure. The top of the needle is magnetized and will attach to the end of the driver. Once the needle is attached to the driver, remove the needle from its plastic container.
3. Twist the sterile needle cap (cover) and gently remove it from the end of the needle. Do not touch the end of the needle otherwise.
4. Place the driver in your dominant hand. Relocate your insertion site with the opposite hand.

F. **Insertion**:
1. Position the needle over the insertion site with the needle at a 90 degree angle to the surface of the bone. Power the needle with firm pressure thru the skin until it reaches the surface of the bone (see Figure 5). There is a 5 mm mark on the needle that should still be visible. If it is not, the procedure should be abandoned or relocated to an alternate site as the needle may not be long enough to penetrate the IO space.
2. If appropriate, continue the insertion, powering the needle with firm and steady pressure until the flange touches the skin or a sudden lack of resistance is felt (indicating entrance into the bone marrow cavity).
3. Remove the driver.
4. While grasping the hub with one hand, rotate the stylete counterclockwise (unscrew it) and remove it (see Figure 6).

G. **Confirmation**:
1. Attach the EZ-Connect IV extension set to the catheter hub's luer lock.
2. Flush 1-2 ml NS to clear needle of any bony particulates.
3. Immediately aspirate a small amount looking for a return of blood.
4. The needle should be well seated in the bone at 90 degrees.
5. After confirmation, flush the needle with 8-10 ml of sterile saline. There should be a free flow of fluid with no leakage of fluid under the skin (see Figure 7).
6. Attach IV and cover with sterile dressing.
7. The IV solution should flow by gravity through the IO, but it may be necessary to apply a pressure infusion bag to the IV bag to increase the rate of infusion (see Figure 8).
8. Note the date and time of insertion on the yellow instructional wrist band and apply to patient in a prominent location (wrist or ankle).

V. NOTES:

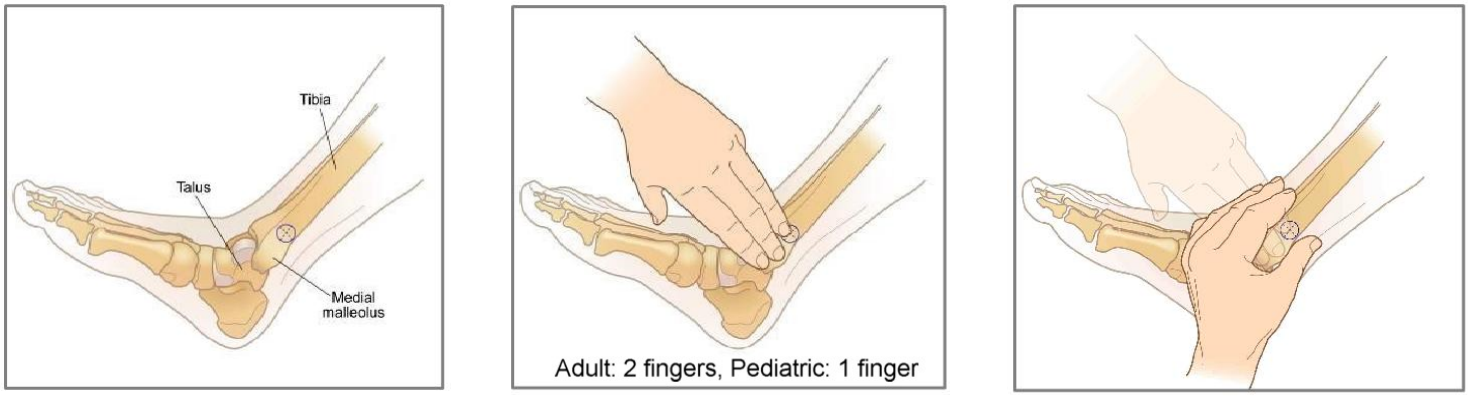
A. The EZ-IO should not be left in place for more than 24 hours. It can be removed by rotating gently in a clockwise fashion while gently pulling the on the hub of the IO at 90 degrees.

B. **Ketamine**: adult 0.5-1 mg/kg IBW, 100 MG MAX via SLOW IO;
pediatric 0.25 mg/kg IBW, 25MG MAX via SLOW IO.
Indications: pain/discomfort associated with post insertion and/or subsequent fluid resuscitation.

VI. FIGURES:

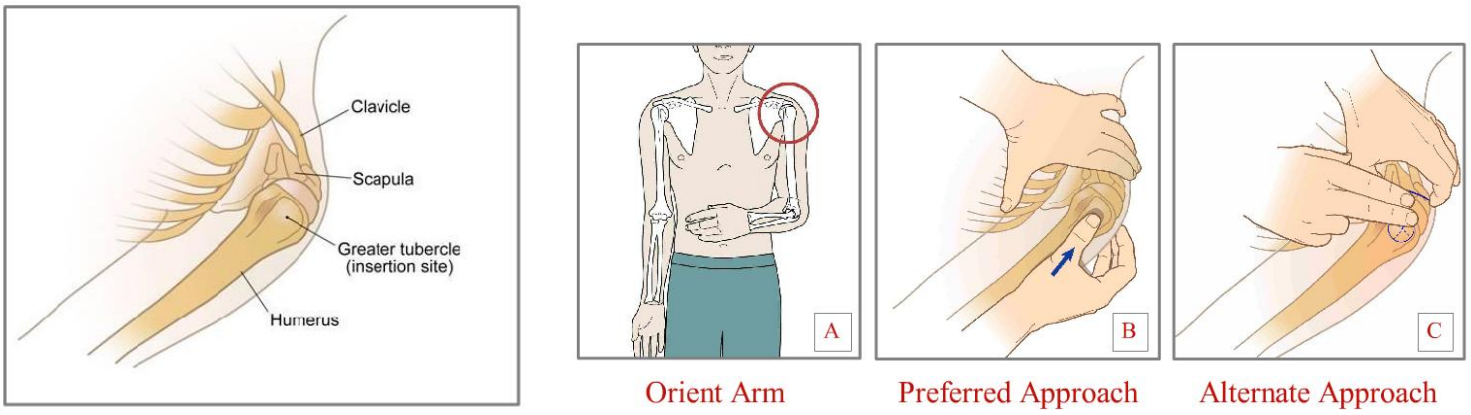
A. Figure 1: Pediatric Proximal Tibia

B. Figure 2: Adult and Pediatric Distal Tibia

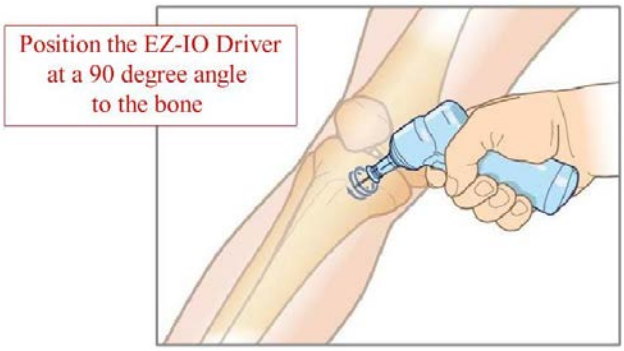


C. Figure 3: Adult Proximal Tibia

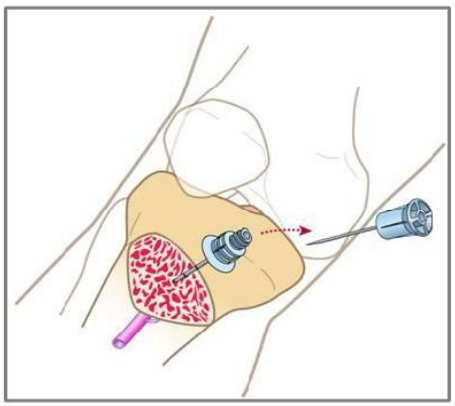
D. Figure 4: Adult Proximal Humerus



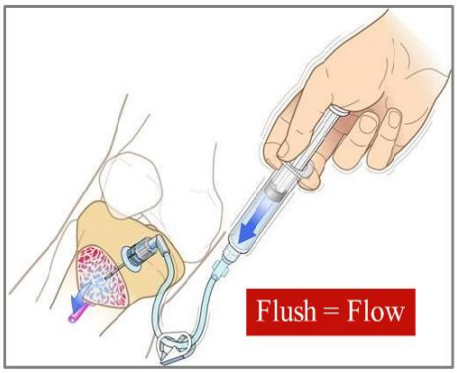
E. Figure 5:



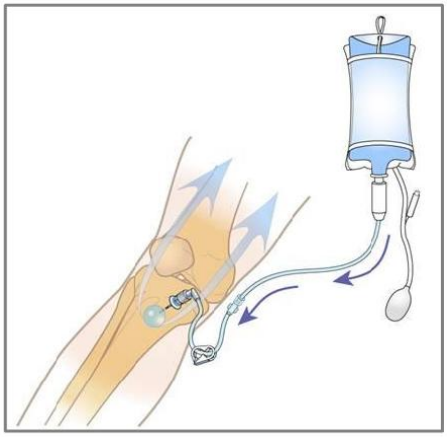
F. Figure 6:



G. Figure 7:



H. Figure 8:



PROCEDURE GUIDELINE
INDUCED HYPOTHERMIA - ROSC

- BEGIN COOLING PATIENTS WITH COLD SALINE IMMEDIATELY!

- Criteria for Induced Hypothermia:
    - Age greater than 18
    - Patient has an advanced airway in place and remains comatose (no purposeful response to pain)
    - Non-Traumatic Cardiac Arrest

- Exclusion Criteria for Induce Hypothermia:
    - Trauma Cardiac Arrest
    - Awake and responsive to verbal commands after cardiac arrest

Procedure:

1. If patient meets criteria for induced hypothermia and does not have an advanced airway, then intubate with ETT or establish an iGel Airway according to protocol before inducing cooling.
2. If unable to establish an advanced airway **DO NOT** continue hypothermia.
3. If successful application of an advanced airway, assure that the capnography reads > 20mmHg and a O2 sat > 94%.
4. Perform a neuro exam and record on EPCR.
5. Expose the patient and apply ice packs to the head (1 pack) and axilla (2 packs).
6. If patient begins to shiver or sedation is needed administer **VERSED** 2mg IVP to max. of 10mg.
7. Administer 1 Gram of **Magnesium Sulfate**.
8. Continue cold saline bolus (4C) 30mL/kg to max. of 2 Liters.

PROCEDURE GUIDELINE
INDUCED HYPOTHERMIA - ROSC

9. If needed administer **DOPAMINE** 5mcg/kg/min to 20mcg/kg/min for a Mean Arterial Pressure (MAP) of ≥ 70. The MRX displays the MAP next to the BP display.

10. Contact hospital and alert them of hypothermia patient, transport to nearest appropriate facility.

11. DO NOT HYPERVENTILATE, target ETCO2 of 40 mmHg.

12. GOAL: to drop body temperature 1 degree C.

13. Monitor temperature using temporal thermometer in Celsius.

PROCEDURE GUIDELINE
INJECTIONS: SUBCUTANEOUS IM AND IN

Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ (not auto-injector) or IM route or as an alternative route in selected medications.

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for subcutaneous injection is the arm. Injection volume should not exceed 1 cc.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh. Injection volume should not exceed 1 cc for the arm. Injection volume should not exceed 2 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Expose the selected area and cleanse the injection site with alcohol.
8. Insert the needle into the skin with a smooth, steady motion
   SQ: 45-degree angle skin pinched **IM: 90-degree angle skin flattened**
9. Aspirate for blood.
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. Document the medication, dose, route, and time on/with the patient care report (PCR).

Basic Technique for Intranasal Device:

1. Draw up medication in 3ml syringe
2. Attach atomizer tip and eject any air from syringe
3. Place atomizer tip approximately 1.5 cm within the nostril
4. Briskly compress the syringe plunger to spray atomized solution into the nasal cavity/on to the nasal mucosa (gently pushing the plunger **will not** result in atomization).

PROCEDURE GUIDELINE
KENDRICK EXTRICATION DEVICE (KED)

1. **Indications:**
   - In some situations a patient with possible spinal injury cannot be immediately secured to a Long Spineboard, e.g., when a patient is in a confined space or seated in a vehicle. In such cases a flexible piece of equipment (such as a vest-type Short Spineboard), is useful for immobilizing possible spinal injury patients.
   - You should **always suspect** a possible spinal injury anytime you encounter a patient with complaints of "pain in the neck or back", following any of the following mechanisms of injury:
     - Motor Vehicle Accident (MVA).
     - Pedestrian vs. Motor Vehicle Collisions.
     - Fall.
     - Blunt trauma.
     - Penetrating trauma to the head, neck, or torso.
     - Diving accidents.

2. **Equipment:**
   - KED ® (Kendrick Extrication Device).
   - Head/neck pad.
   - Cervical Collar - correct size for the patient.

3. **Procedure:**
   - Stabilize neck in a neutral, in-line position and apply a cervical collar.
   - Any assessment of the back, scapulae, arms, or clavicles must be done before applying the device.
   - The EMT-B applying the board must angle it to fit between the arms of rescuer who is stabilizing patient's head and neck from behind.
   - The EMT-B must push the device as far down into the seat as possible, otherwise the board may shift when moving patient. The base of the board should not extend past patient's coccyx.
   - Never place a chin cup or strap on patient. Such devices may prevent patient from opening his mouth if he has to vomit.
   - Position the side flaps around patient's torso.
   - Secure torso straps.
   - Secure groin loops.
   - Pad behind patient's head and neck to fill in the gaps, and secure forehead strap and lower head strap.
   - Fasten remaining chest straps.
   - After moving patient to a Long Spineboard, release groin straps and loosen chest strap.
   - Secure patient to Long Spineboard following Procedure Guideline.

PROCEDURE GUIDELINE
iGel SUPRAGLOTTIC AIRWAY

Indications for Blind Insertion Airway Device (BIAD) Use: iGel device

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances requires a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be unconscious.

Contraindications:

- Responsive patients with a gag reflex
- Patients in whom caustic substance ingestion is suspected

Procedure:

1. Preoxygenate and hyperventilate the patient.
2. Select the appropriate tube size for the patient.
   - #3 Small Adult 30-60 Kg (65-130 Lbs)
   - #4 Medium Adult 50-90 Kg (110-200 Lbs)
   - #5 Large Adult 90+ Kg (200 + Lbs)
3. Open packet of lubrication and place small bolus on inner shell of main packaging. Lubricate the back, sides and front of i-gel with thin layer. (Ensure any excess is removed prior to insertion
4. Use head tilt when not contraindicated to achieve anatomical alignment of the patient's airway for optimal airway access.
5. Insert the leading soft tip into the mouth of the patient towards the hard palate. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt. (1) The tip of the airway should be located into the upper esophageal opening, (2) with the cuff located against the laryngeal framework (3). The incisors should be resting on the bite block.
6. Secure the device by sliding the strap underneath the patient's neck and attaching to the hook ring. Take care to ensure the strap is not secured too tight.
7. **Ventilate confirming placement.**
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. Confirm tube placement using end-tidal CO2 detector. Monitor with capnography.
10. Reasses after each time patient is moved..
11. Use an OG tube to assist in decompressing the stomach. *(See Orogastric Tube Insertion Procedure Guideline pg.3-74).*

PROCEDURE GUIDELINE
INFUSION PUMP

Quick Reference for use of Baxter Syringe Pump

1. **Properly secure filled syringe into pump (manually purge IV line from syringe first)**
2. **Turn unit on. Library will appear:**
   Select Adult Pedi or None with up/down arrows and confirm
3. **Protocol will appear**
   Select medication with up/down arrows
4. **Select manufacturer. (Should normally be B–D.) Confirm**
5. **Verify that you are utilizing a 60 ml syringe. Confirm**
6. **Most medications in library already have rate set. Confirm**
   (Remember that dopamine requires estimated weight (kg))
7. **To purge line (Prior to hooking up to patient) Push purge button and start.**
8. **Once purge is complete will be on standby. Select start and confirm**
9. **At this point unit should be in operation as noted by running green lights**

Specific medications.

1. Dopamine MUST be mixed 400mg/250ml for a concentration of 1600ug/ml. (1.6mg/ml). This concentration is required for the calculations entered in the pump. Once in the Dopamine menu you will be prompted to enter body weight (kg). Enter and confirm. Confirm concentration of 1.6 mg/ml (1600mcg/ml). Confirm starting dose of 5mcg/kg. Purge - Once purged will be in stand-by mode- Connect Tubing- Start

2. Cordarone 150 mg is diluted in saline or D5w for a total of 35 cc in 60 ml syringe. Gently mix in syringe prior to purging line. Once in Corda 150 menu you will be prompted to confirm infusion rate of 3.5 ml/min. This will administer the 150mg dose over a 10 minute period. Confirm- Purge- connect tubing and Start. *[This is the ADULT dose/drip setting]*

3. Cordarone Drip. Mixing 150 Cordarone in 50 ml D5W. (To get exact concentration, should withdraw 3ml of D5W from bag prior to adding the Cordarone as this will equal exactly 50 mls.) This will yield concentration of 3.0 mg/ml. Dose will be 1 mg/min Rate will be 20ml/hr- Confirm- Purge- Connect- Start. *[This is the PEDI dose/drip setting]*

4 Magnesium Sulfate Drip for expectant mothers with clearly observed S/S of Pre-Eclampsia.

Mix 5 grams in 250 ml D5W to infuse over 30 minutes. Rate will be 500ml/hr.

5. Labels will be pre-printed for each medication. ALWAYS ATTACH the appropriate label to syringe! Proper documentation on PCR will be expected!!

6. Remember: If you use the pump to continue hospital medications- the easiest route is based on ml per hour. If medication X is running on the hospital pump at ___ ml/hr; You may draw that medication up into your 60 ml syringe. You will select None for library and follow the prompts to enter the ml's/hr.

PROCEDURE GUIDELINE
PICC LINE ACCESS

A Peripheral Inserted Central Line (PICC) is a common method maintaining long-term venous access in select patients. PICC lines are typically inserted into the antecubital fossa, and then threaded into central circulation. PICC lines are flushed with heparin to maintain patency and therefore it is imperative to aspirate 5 ml of blood from the line prior to use.

INDICATIONS:

A. **PICC Lines are only to be used in the event of CARDIAC ARREST in lieu of an I.V./ I.O**.

CONTRAINDICATIONS:

A. Inability to aspirate or infuse through the catheter.
B. Catheter located in any place other than the patient's upper arm.

PROCEDURE:

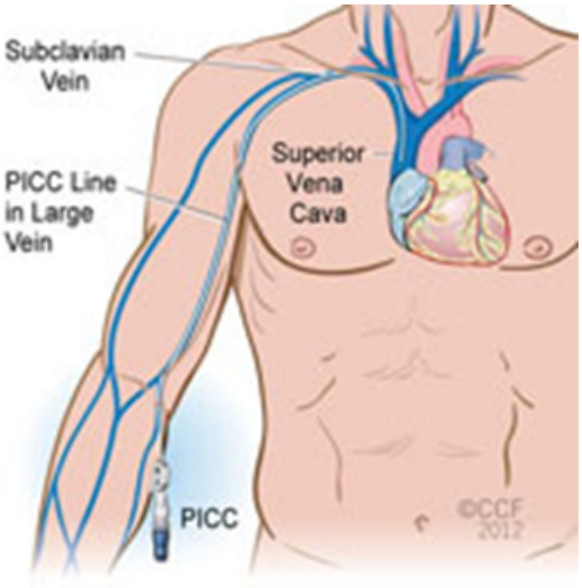
A. Use clean gloves and maintain sterility as much as possible.
B. If there is a needleless type port on the distal end of the catheter, perform the following: *(figure 1)*
    1. Scrub the port with an alcohol pad for at least 10 seconds and allow to dry for at least 5 seconds.
    2. Attach a 10 ml syringe (without saline) to the port.
    3. Unclamp if necessary (needless port may not have a clamp)
    4. Attempt to aspirate at least 5 ml of blood. Blood should draw freely. If it does not, remove the syringe and DO NOT use the catheter for access.
    5. If blood aspirates freely, remove the 10 ml syringe with blood and discard.
    6. Attach a 10 ml syringe with NS and gently flush the line. Never use a smaller syringe. If line does not flush, remove the syringe and DO NOT use the catheter for access.
    7. If line flushes, remove the syringe and attach the catheter to the end of the IV tubing and begin infusion of NS. Adjust the rate to the needs of the patient within the limits of the catheter.
    8. Administer medications though IV tubing port if indicated.

NOTES & PRECAUTIONS:

A. Do not administer medications, flush or aspirate with less than a 10 cc syringe. Smaller size syringes generate too much pressure and can damage the catheter.
B. Do not attempt to reiniect aspirated blood as it may contain clots.
C. The maximum flow rates for a PICC line is 125 ml/hr for less than size 2.0 French, and 250 ml/hr for catheters over 2.0 size French.
D. Keep patient's arm straight to avoi kinking the PICC line and obstructing flow.
E. Ensure all line connections are secure.
F. PICC lines access the patient's central circulation and the risk of infection is high. Avoid contamination to ports and connections while accessing.
G. Do not administer the following medications through a PICC line:
    a. **Adenosine**- The line may rupture during rapid infusion due to over pressurization.
    b. **Dextrose 50%-** The catheter can be damaged by due to the viscosity of the fluid.

PROCEDURE GUIDELINE
PICC LINE ACCESS (CONTINUED)

Figure 1



Typical PICC line path to heart

Most all picc lines have needleless ports and we wil only be accessing the "blue" side of the port not the "red".

PROCEDURE GUIDELINE
NEBULIZED MEDICINE / UPDRAFT

1. **Equipment:**

   - 1 oxygen supply tubing.
   - 1 nebulizing chamber.
   - 1 T piece.
   - 1 mouth piece or aerosol mask.
   - Non-humidified oxygen with a flow meter.
   - Medication to be given.

   NOTE: Aerosol mask doesn't require patient's help and may deliver a higher O_2 percentage.

2. **Procedure:**

   - Assemble oxygen supply tubing to the nebulizer.
   - Add the medication to the nebulizing chamber.
   - Connect the top of the nebulizing chamber.
   - Connect the T piece to the top of the nebulizing chamber.
   - Connect the mouth piece or aerosol mask to the T piece.
   - Connect the oxygen supply tubing to the oxygen flow meter.
   - Set the flow meter to 6-8 liters / minute and watch for the medication to mist.
   - Give the nebulizer to the patient and have them breathe the medication.
   - If the patient is unable to hold the nebulizer, remove the mouth piece from the T piece and apply T piece to an aerosol mask.
   - Auscultate breath sounds.
   - ***Monitor:*** *Blood pressure, heart rate and respiratory status frequently.*

PROCEDURE GUIDELINE
INTUBATION- OROTRACHEAL

1. **Indications:**

- Respiratory or cardiac arrest.
- Glasgow Coma Scale of 8 or less.
- Possible airway obstruction.

2. **Equipment:**

- Laryngoscope handle with appropriate size blade.
- Proper size endotracheal tube.
- Water soluble lubrication gel, (lubricate distal end of tube at cuff).
- 10 cc syringe, (check cuff for patency).
- Stylet, (insert into ET tube).
- Tape or endotracheal securing device.
- Proper size oral pharyngeal airway.
- BVM.
- Suction.
- Stethoscope.

3. **Insertion:**

- If C-spine injury suspected, maintain cervical alignment and apply C-collar.
- Ventilate the patient 1 breath every 10 seconds before intubation procedure.
- Attach proper blade to laryngoscope handle and check light.
- Grasp laryngoscope handle in left hand.
- Grasp ET tube in right hand.
- If CPR is in progress, stop CPR but no more than 20 seconds. Maximum interruption of ventilations should not exceed 30 seconds.
- Remove all foreign objects, such as dentures, oral pharyngeal airways, etc. and suction the patient's airway if needed.
- Insert the blade into the right side of the patient's mouth sweeping the tongue to the left side.
- Visualize the vocal cords without pressure on the teeth.
- Intubation attempt is considered anytime an endotracheal tube is passed beyond the incisors.
- Insert the endotracheal tube until the cuff passes the vocal cords. (Insert far enough so that balloon port tubing is even with lips.)
- Remove the laryngoscope blade.
- Inflate the endotracheal cuff with the syringe with 5 - 10 cc of air and remove the syringe from inflation valve.

PROCEDURE GUIDELINE
INTUBATION- OROTRACHEAL (CONTINUED)

- Ventilate the patient with a BVM and watch for chest rise. Listen to abdomen to ensure that an esophageal intubation has not been done. Listen for bilateral breath sounds and watch for a positive change on the end-tidal CO2 detector or presence of wave form with in-line capnography.
  - **If abdominal sounds are heard,** deflate the endotracheal cuff and remove the endotracheal tube immediately. Ventilate the patient and attempt intubation again.
  - **If lung sounds are unequal,** deflate the endotracheal cuff and reposition the endotracheal tube. Inflate endotracheal cuff and reassess lung sounds. If lung sounds are still unequal, assess the patient for Pneumothorax, (simple or tension).

- Ventilate patient with BVM.
- Resume CPR. If needed insert an OG Tube to assist in decompressing the stomach (Cardiac Arrest patients ONLY). *See Orogastric Tube Insertion Procedure Guideline pg. 3-74*

4. **Secure:**

- Tape or use endotracheal securing device and secure endotracheal tube in place noting depth of tube.
- Insert oral pharyngeal airway.
- Reassess lung sounds to ensure endotracheal tube is still in proper position.
- Continue ventilations.

PROCEDURE GUIDELINE
OXYGEN ADMINISTRATION

1. **Indications:**

- **Nasal Cannula**: for the spontaneously adequately breathing patient with no significant compromise or **potential** compromise in condition. Choice is determined by severity of condition, practice parameters and patient tolerance.
- **Non-Rebreather Mask**: for any patient whose condition or complaint suggests that severe hypoxia or ischemia may be a problem. Use on all multi-trauma patients and all patients who present with sign and symptoms of shock.
- **Bag Valve Mask (BVM):**
  - ***Assist ventilations in the conscious or unconscious hypoxemic patient*** *who is not moving air adequately.*
  - ***Ventilate the apneic patient.***

2. **Equipment:**

- **Nasal Cannula:** 4 - 6 liters/minute delivers 25 - 40 % of oxygen.
- **Non-Rebreather Mask (NRB):** 15 liters/minute delivers nearly 100 % of oxygen.
- **Bag Valve Mask, (BVM),** with supplemental oxygen at 15 liters/minute and reservoir attached delivers nearly 100% oxygen

PROCEDURE GUIDELINE
PERIPHERAL VENIPUNCTURE

1. **Equipment for Fluid Administration:**

- *IV solution.*
- *Micro drip, macro drip, blood set tubing.*
- *# 14 - #24 catheter over the needle.*
- *Venous tourniquet*
- *Alcohol Prep*
- *Gauze pad or adhesive bandage.*
- *Tape and / or tegaderm.*

2. **Assemble the equipment:**

- Open IV bag for clarity, expiration date, etc.
- Examine the IV bag envelope at the edge where it is notched.
- Read the name of the solution.
- Open IV tubing.
- Close control valve below the drip chamber.
- Insert IV tubing in the IV solution bag port.
- Squeeze the drip chamber until the drip chamber is half full of solution.
- Uncap distal end of tubing and hold the cap so it does not become contaminated.
- Open the IV tubing valve to allow the solution to flow through until all bubbles are out of the tubing.
- Close the tubing valve and recap the distal end of the tube.

3. **Insertion:**

- Explain to the patient that an IV is going to be started.
- Place the tourniquet around the patient's arm proximal to the IV site.
- Palpate veins for resilience.
- Clean the skin with the alcohol prep/swab in an increasing sized concentric circles
- Stabilize the vein distally with the Paramedic's thumb/fingers.
- Enter the skin with the bevel of the needle facing upward.
- Enter the vein, obtain a flashback, and advance the catheter off of the catheter over the needle and remove the needle (lock protective needle cover before removing the needle) while compressing the proximal tip of the catheter to minimize blood loss.
- Remove the tourniquet.
- Connect IV tubing to the catheter.
- Open the IV clamp to assure free flow.
- Set IV infusion rate.

PROCEDURE GUIDELINE
PERIPHERAL VENIPUNCTURE (CONTINUED)

3. **Secure:**

- Apply Tegaderm over the insertion site of the skin.
- Secure the IV catheter and tubing with prepared tape.
- Recheck IV drip rate to make sure it is flowing at appropriate rate.

4. **Troubleshooting the IV**, (if the IV is not working well):

- Make sure the tourniquet is off.
- Check the IV insertion site for swelling.
- Check the IV tubing clamp to make sure it is open.
- Check the drip chamber to make sure it is half full.
- Lower the IV bag below IV site and watch for blood to return into the tubing.

---

1. **Equipment for Saline Lock:**

- Saline lock.10cc Normal Saline pre-filled syringe
- 10cc Normal Saline pre-filled syringe.
- Blood set tubing..
- #14-#24 Catheter over the needle.
- Venous Tourniquet.
- Alcohol prep.
- Tegaderm and/or tape.

2. **Procedure:**

- After successful IV cannulation, the open end plastic tip of the Saline Lock is inserted into the IV catheter hub using aseptic technique. The Saline Lock should be placed securely into the IV catheter to prevent accidental removal and blood loss.
- Once the Saline Lock is secured, it must be immediately secured with tape/tegaderm and flushed with 10cc's of normal saline from the available pre-filled syringe.
- Conventional IV site monitoring is indicated to ensure patency during flushing. If resistance is felt during administration, do not force administration. Check for common problems such as tourniquet still in place, swelling in tissues or at puncture site. If the problem is not resolved, the catheter is likely occluded, against a valve, or has infiltrated. In these cases the catheter should be removed and another attempt should be made at venous access.
- In some cases, a patient that initially only required precautionary IV access with a Saline Lock may require an IV push medication or fluid administration. In this situation an IV infusion set shall be used by attaching it to the Saline Lock.
- Certain situations may warrant immediate IV push medication administration directly through the Saline Lock without sufficient time for set up of the infusion set (such as witnessed cardiac arrest). In these instances the Saline Lock shall be flushed immediately after medication administration via use of the 10cc pre-filled syringe.

PROCEDURE GUIDELINE
PHYSICAL RESTRAINTS

Clinical Indications:

- Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

Procedure:

1. Attempt less restrictive means of managing the patient.

2. Request law enforcement assistance.

3. Ensure that there are sufficient personnel available to physically restrain the patient safely.

4. Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other devices will be on top of the patient. The patient will never be restrained in the prone position.

5. The patient must be under constant observation by the Paramedic at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.

6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This MUST be documented on the PCR.

7. Documentation on/with the patient care report (PCR) should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed.

8. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. (Chemical restraint may be considered earlier.)

9. If a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel can not remove; a law enforcement officer must accompany the patient to the hospital behind (in patrol car) or in the transporting EMS vehicle.

PROCEDURE GUIDELINE
PLEURAL DECOMPRESSION

1. **Indications:**

   - Chest decompression for relief of tension pneumothorax

   Tension Pneumothorax should be suspected when there is a lack of lung sounds and marked drop in BP

2. **Equipment:**

   - 14 gauge 3.25 inch catheter over the needle
   - Tape
   - Sterile gauze pads
   - Alcohol prep
   - Occlusive dressing

   FLUTTER VALVES WILL NO LONGER BE UTILIZED IN THIS PROCEDURE

3. **Procedure:**

   - Locate decompression site.
     - ***Identify the 2nd intercostal space in the mid-clavicular line*** *on the same side as the pneumothorax.*

       OR
     - ***Identify the 5th intercostal space in the mid-axillary line*** *on the same side as the pneumothorax.*

   - Prepare the site with an antiseptic swab:
     - *Firmly introduce catheter immediately above the distal rib of the site selected.*

   - Insert the catheter through the parietal pleura until air exits. It should exit under pressure.

   - Advance catheter and remove needle.

   - Secure the catheter taking care not to allow it to kink.

   - Reassess lung sounds and patient condition.

   - Dress area with occlusive dressing then cover with sterile gauze pad.

   - Assess breath sounds and respiratory status.

BE AWARE: EXCESSIVE POSITIVE PRESSURE VENTILATIONS CAN WORSEN A PNEUMOTHORAX

PROCEDURE GUIDELINE
RECONSTITUTION OF MEDICATIONS

1. **Indications:**

   - Preparation of **Glucagon**

2. **Equipment:**

   - Diluting Solution
   - Glucagon Powder
   - Sterile 1 ml syringe
   - Alcohol swab

3. **Procedure:**

   - Remove the flip-off seals on bottles Nos. 1 and 2.
   - Wipe rubber stoppers on both bottles with the alcohol swab.
   - Pull up 1/2 ml of air.
   - Inject the air into the diluting solution bottle (No. 1). Keep the tip of the needle in the solution and withdraw the entire contents of the solution.
   - Remove syringe from bottle No. 1 and insert into bottle No. 2 (Glucagon powder). Inject all of the diluting solution into bottle No. 2.
   - Remove syringe and dispose of properly. Shake bottle No. 2 gently until the Glucagon powder dissolves and the solution becomes clear.
   - Administer the Glucagon immediately after reconstituting.

1. **Indications:**

   - Preparation of **Cyanokit**

2. **Equipment:**

   - Transfer spike
   - Cyanokit Vial
   - 100 ml Normal Saline
   - Alcohol swab

3. **Procedure:**

   - Remove the flip-off seals on bottle.
   - Wipe rubber stoppers on bottle with the alcohol swab.
   - Insert transfer spike.
   - Add 100 ml of 0.9% Sodium Chloride (Normal Saline) in to Cyanokit vial
   - Fill to line keeping vial in upright position.
   - Rock or rotate vial for 30 seconds to mix solution.

     DO NOT SHAKE!!
   - Hang and infuse over 7.5 minutes.

PROCEDURE GUIDELINE
RECTAL MEDICATIONS

1. **Indications:**

   - Inability to establish peripheral IV access
   - Patient in status seizure activity

2. **Equipment:**

   - 3 cc syringe.
   - 18 gauge needle.
   - 14 gauge catheter (needle removed)
   - Diazepam.

3. **Procedure for administration:**

   - Using a 3 cc syringe with a #18 gauge needle, draw up appropriate dosage of Diazepam.
   - Remove the needle from the syringe.
   - Attatch a 14 gauge catheter without the needle to the end of the syringe.
   - Lubricate the **catheter tip** with a water soluble gel if necessary.
   - Place the patient on their side with their knees bent forward, (if possible).
   - Insert the catheter tip into the rectum and **slowly** administer the Diazepam.

PROCEDURE GUIDELINE
SCOOP STRETCHER

1. **Indications:**
   - For moving an injured patient who does not require spinal immobilization.

2. **Precautions:**
   - In cases of possible spinal injury, it should be used only to transfer patient to a Long Spine board while patient's head and neck are immobilized in an in-line, neutral position.
   - The stretcher may trap clothing, skin, or other objects while "scooping" patient. Use Caution!

3. **Equipment:**
   - Scoop stretcher.
   - Spine board straps.
   - Cervical collar - properly sized.

4. **Procedure:**
   - Prepare patient by applying a cervical collar and maintaining manual in-line, midline spinal immobilization. Maintain throughout the application procedure.

   - Adjust the length of the stretcher so it extends about 4-6 inches beyond the patient. Separate the stretcher halves and place one half on each side of patient.

   - Slide the stretcher halves under patient, one at a time. Be careful not to trap clothing, skin, or other objects while "scooping". If necessary, roll patient as a unit to either side to allow for proper positioning of the parts.

   - Mate latch parts and make certain the stretcher halves are securely locked together.

   - Now patient can be moved to the Long Spine board or ambulance stretcher.

PROCEDURE GUIDELINE
SUCTIONING

1. **Indications:**
   - When patient's mouth or throat becomes filled with vomitus, blood, or secretions, a suction apparatus enables removal of the liquid material quickly and efficiently.

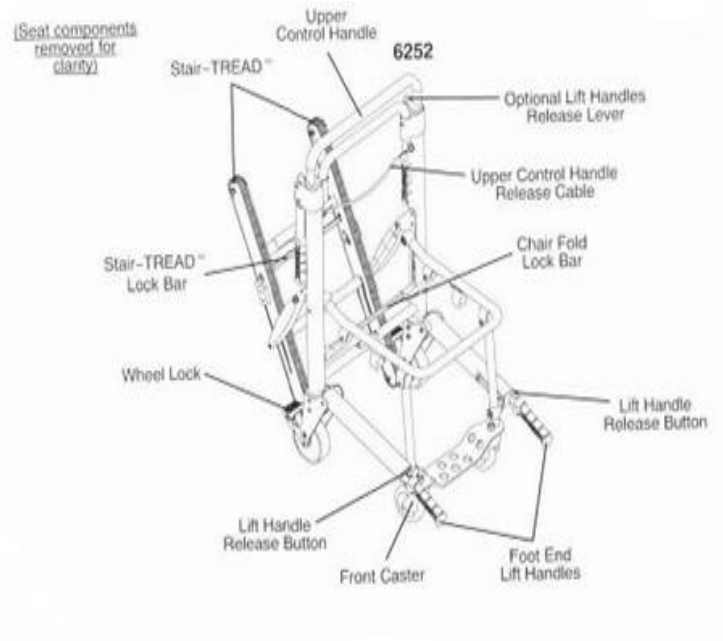
2. **Equipment**:
   - Use PPE for this procedure.
   - Fixed or portable suction unit capable of generating a vacuum of 300 mm Hg, with a non-breakable collection bottle.
   - Collection tubing - stiff, clear, and long enough to reach patient's head.
   - Bottle of water - for rinsing the suction system after suctioning.
   - Flexible suction catheters - for suctioning the nose and pharynx.
   - Tonsil-tip or Yankauer suction catheter - for suctioning the mouth and pharynx of unconscious patients. (Easier to direct where you want it to go.)

   Caution: Suctioning removes not only liquids from the airway; it removes air as well!

3. **Procedure:**
   - Any patient who is to be suctioned should be **pre-oxygenated,** or hyperventilated prior to the procedure.
   - Use a rigid tip, tonsil-tip suction catheter to suction the mouth and throat of an unconscious patient. It can remove large volumes of fluid, small food particles, and vomitus quickly.
     a) Inspect suction unit to make sure all parts are working and assembled.
     b) Attach tonsil-tip catheter to tubing.
     c) Open patient's mouth using crossed-finger maneuver.
     d) With **vacuum off**, insert suction catheter into patient's mouth deep enough so that you can see the tip in the area of the mouth that you want to clear. Use Caution: Semiconscious patients may gag or vomit if a hard object touches the back of their throat.
     e) Turn on suction or occlude the side hole and move catheter tip around pharynx to vacuum (clean) it out.
     f) ***DO NOT SUCTION FOR MORE THAN 10 SECONDS AT A TIME!***
     g) Remove catheter, and **re-oxygenate,** or hyperventilate patient after the suctioning procedure.
     h) RINSE tonsil-tip catheter and tubing with water.

IF YOU NEED TO SUCTION PATIENT DURING CPR, MAKE IT QUICK! DO NOT INTERRUPT ARTIFICIAL VENTILATIONS FOR MORE THAN **5 SECONDS**, AND THEN RESUME VENTILATIONS WITH 100% OXYGEN.

PROCEDURE GUIDELINE
STRYKER STAIR CHAIR



To unfold the chair (Fig. 1)

1) Stand behind the chair
2) Apply the wheel locks (optional)
3) Pull the backrest and the lower extension handles apart
4) The automatic locking mechanism will engage when fully separated

To fold the chair up: Figs. 2

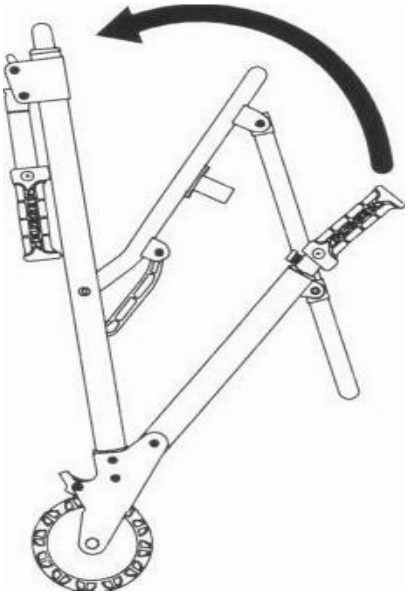
1) Apply the wheel locks (optional).

2) Buckle the restraint straps and fold them neatly to prevent them from interfering with proper folding of the chair.

3) Stand at the side of the chair.

4) Pull up on the red lock bar at the rear of the chair. Tip the chair forward.

5) Fold the seat up to the backrest until the front legs lock in the clips on the bottom of the seat tube



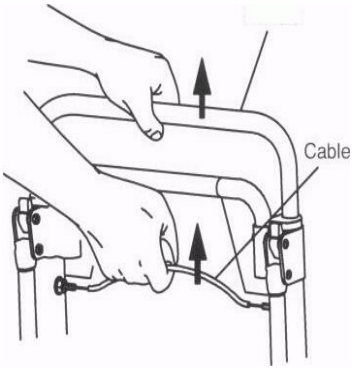
PROCEDURE GUIDELINE
STRYKER STAIR CHAIR (CONTINUED)

Transporting the patient downstairs using the'Stair Tread'

Warning;
Ensure all Stair tread and the lower lift handles are locked in place before starting the descent

To avoid injury, transporting the patient on stairs requires a minimum of two operators. More operators may be employed when handling a difficult situation

1) Roll the chair to the stairs and align it squarely with the edge of the first step with the operators facing each other. Release the upper control handle by pulling on the release cable. Squeeze the red track release bar to release the Stair-Tread

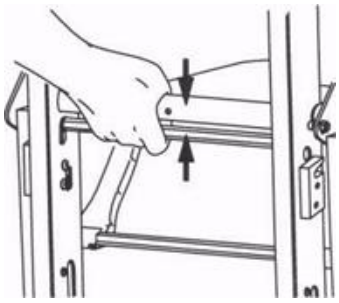


2) EMT #1 tilts the chair back just far enough to allow the Stair-Tread to contact the floor

3) With EMT #2 holding the lower lifting handles – maintain the angle and guide the chair over the edge of the stairs allowing the Stair-Tread to engage the first step

4) Both operators - Glide the chair down the stairs until the treads are level across the edges of two or three steps.

5) EMT #1 applies slight downward pressure on the extendable upper control handle while the EMT #2 applies slight upward pressure on the foot end lift handles to keep the chair from rocking forward as it glides down the stairs.



6) When the track reaches the last step, the EMT #2 releases the front handles and the EMT #1 allows the chair to tip forward until all four wheels are on the ground.

7) Roll the chair forward then fold the Stair- Tread up

8) To fold the Stair-TREAD up pull the red track release bar toward the black cross bar and fold the track up toward the chair.

9) Verify the Stair-TREAD is locked in place.

If, while descending the stairs, either operator needs to pause or rest, tilt the chair forward just enough to allow the rear wheels to rest in the crook of the stair.

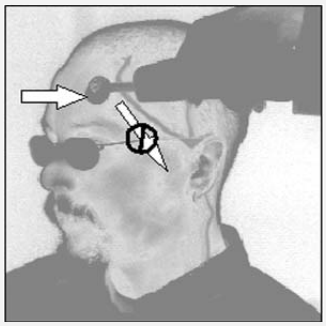
To continue down the stairs from the resting position, the head end operator exerts slight downward pressure on the upper control handle while the foot end operator provides slight upward pressure to tilt the chair back and engage the Stair-Tread

PROCEDURE GUIDELINE
EXERGEN Temporal *Scanner*™

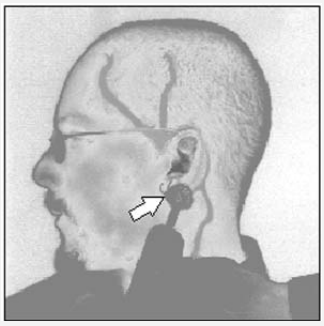
1. **Indications** – to be used to monitor the Temporal Artery temperature of patients with the following suspected conditions:
    - **HEAT EMERGENCIES**
    - **COLD EMERGENCIES**
    - **FEBRILE SEZURE**
    - **INDUCED HYPOTHERMIC THERAPY - ROSC**

2. **Equipment**:
    - Temporal Scanner
    - 9 Volt Battery - A standard alkaline 9V battery provides approximately 15,000 readings.
    - 70% Isopropyl alcohol wipes – Use only alcohol solution for sensor lens.

3. **Operating Instructions**:



Measure only the exposed side. Brush hair aside if covering the TA area.



Brush hair away if covering ear.

    a. Carefully clean and disinfect the thermometer Probe Cone before and after use, by wiping the probe area with 70% Isopropyl alcohol.

    b. With probe flush on the center of forehead, depress red button, keep depressed…

    c. Slowly slide probe midline across forehead to the hair line, not down side of face.

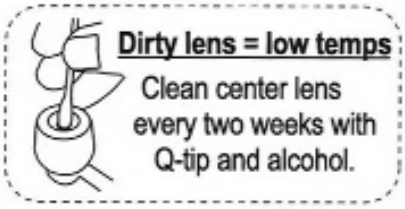
    d. Lift probe from forehead and touch on the neck just behind the ear lobe.

    e. Release the button, read, and record temperature. Temperature will remain on display for 30 seconds after the red button is released. Sequence can be restarted at any time without waiting for display to clear.

PROCEDURE GUIDELINE
EXERGEN Temporal *Scanner*™

Care and Maintenance

- Battery: A standard alkaline 9V battery provides approximately 15,000 readings.
- To replace, loosen the single screw at the bottom of the instrument and remove the battery cover. Disconnect the old battery and replace with a new one in the same location. Replace the cover, and tighten the screw. Use only high quality alkaline batteries or equivalent.
- Handling: The Temporal Scanner is designed and built to industrial durability standards in order to provide long and trouble-free service. However, it is also a high precision optical instrument, and should be accorded the same degree of care in handling as you would provide other precision optical instruments, such as cameras or otoscopes.
- Cleaning the case: The Temporal Scanner case can be wiped down with any hospital approved disinfectant, including bleach.
- Cleaning the sensor lens: With normal use, the only maintenance required is to keep the lens on the end of the probe clean. It is made of special mirror-like, coated silicon infrared-transmitting material. However, dirt, greasy films or moisture on the lens will interfere with the passage of infrared heat and affect the accuracy of the instrument. Regularly clean the lens with a cotton swab dipped in alcohol in accordance with the instruction label on the instrument (see below). Use only light force for cleaning, to avoid damaging the lens. Water can be used to remove any residual film left by the alcohol. Do not use bleach or other cleaning solutions on the sensor lens.



Instructions for Fahrenheit or Celsius Conversion

- The TemporalScanner can be used in either °F or °C. To convert from one scale to the other, the only tool necessary is a paper clip or the tip of a small screwdriver.
- For °F/°C Conversion: • Loosen single screw on bottom of case and remove battery cover.
- Lift battery out of the way. • Locate the little switch to the right of the battery as indicated in the drawing, and with the tip of the paper clip or screwdriver, slide up or down to the opposite position.
- Remove the paper clip or screwdriver. Replace battery and cover.

PROCEDURE GUIDELINE
TRANSCUTANEOUS PACING

1. **Indications:**

   - BRADYCARDIA PROTOCOL

2. **Procedure:**

   - Apply monitor and determine rhythm.
   - Stop CPR, (if applicable).
   - Place electrodes in proper position.
     - ***Place the negative pad and negative pacer wire on left anterior chest****, halfway between the xiphoid process and the left nipple, with the upper edge of the electrode below the nipple line.*
     - ***Place the positive pad and positive pacer wire on left posterior chest*** *beneath the scapula and lateral to the spine.*
   - Turn the pacer on:
     - ***Precautions:*** *Pacemaker output may cause excessive pain/distress in the conscious patient. Consider administration of* ***VERSED in 2.5 mg increments IVP every 3 minutes (this will allow time between dosages for desired effect. Maximum total dosage is 10 mg.***
   - Set the rate at 70 beats per minute.
   - Begin pacing at 85 milliamps (mA) and slowly increase mA until electrical and mechanical capture is achieved or maximum output is reached (200mA).
   - Keep checking for a femoral pulse to determine the response to the pacing, (mechanical capture).
   - If no response to maximum pacing output, interrupt pacing and proceed with appropriate protocol. Continue CPR, (if applicable).
   - Leave pacing electrodes in place during drug therapy and check every 3 - 5 minutes for capture in maximum output setting if not successful initially.
   - If capture present and patient remains hypotensive, increase rate of pacing, (do not exceed 80 BPM).

3. **Standby pacing:**
   - Turn the pacer on.
     - ***Precautions:*** *Pacemaker output may cause excessive pain/distress in the conscious patient. Consider administration of* ***VERSED in 2.5 mg increments IVP every 3 minutes (this will allow time between dosages for desired effect. Maximum total dosage is 10 mg.***
   - Set rate at 70 BPM.
   - Set milliamps at 0.
   - If patient becomes unstable, slowly increase milliamps until electrical and mechanical capture is achieved or max. output (200mA) is reached.

PROCEDURE GUIDELINE
TRACTION SPINT (HARE TYPE)

1. **Indications:**
   - Fractures of the shaft of femur.

2. **Contraindications:**
   - Fractures to the lower third of leg.
   - Fractured pelvis.
   - Hip injury with gross displacement.
   - Any significant injury to knee, ankle, or foot.

3. **Equipment:**
   - Traction Splint - Hare Type.
   - Ankle hitch with D-ring.

4. **Procedure:**
   - Use PPE for this procedure.
   - Expose injury site.
   - Assess and record the distal pulse, sensation, and motor function distal to injury site.
   - Place splint beside patient's uninjured leg, and adjust it to where it extends from patient's ischial tuberosity to 10-12 inches beyond the foot.
   - Open and adjust the four Velcro support straps so 2 are positioned mid thigh, 1 above the knee, and 1 above the ankle.
   - One EMT-B should gently support and stabilize injured leg so it will not move.
   - The second EMT-B should fasten the ankle hitch about the patient's ankle and foot, and start to apply longitudinal traction to the hitch and foot.
   - The second EMT-B slides the splint under patient's injured leg making sure that the padded ring is seated well on the ischial tuberosity. The ischial strap is then applied.
   - The second EMT-B then connects the loop of the ankle hitch to the end of the windless devise and applies traction until:
     - ***Patient feels relief from the pain.***
     - ***Injured foot is aligned with the uninjured foot.***
   - Once proper traction has been applied, fasten support straps into place. **Never over the injury**.
   - Reassess and record distal pulse, sensation, and motor function distal to the injury site.
   - Secure patient on a Long Spine board for transport.

PROCEDURE GUIDELINE
SAGER SPLINT

PROCEDURE GUIDELINE
Orogastic Tube Insertion

INDICATIONS:

- Gastric decompression of an adult patient in cardiac arrest after endotracheal intubation or iGel Airway insertion has been performed and placement verified.

CONTRAINDICATIONS:

Orogastric tubes are contraindicated in people with particular predispositions to injury from tube placement. These may include:

- Patients with a history of esophageal stricture
- Esophageal varices / Mallory Weiss Tear
- Ingestion of caustic substances
- Recent history of upper GI bleed
- History of stomach or esophageal cancer

Caution should be utilized when passing an OG tube in a patient with suspected cervical spine injury.

- Manual stabilization of the head is required during the procedure.

EQUIPMENT REQUIRED:

- Tape
- Gloves
- Stethoscope
- 60 cc Irrigating syringe
- Water soluble lubricant (KY Jelly)
- NG tube (16 French or 18 French)

PROCEDURE GUIDELINE
Orogastic Tube Insertion

PROCEDURE:

1. Patient ***must have*** an advanced airway in place (i.e. endotracheal tube or iGel Airway)
2. Using the OG tube as a measuring device determine the length of the OG tube to be passed by measuring the length from
    a. nose to earlobe
    b. earlobe to midpoint between xiphoid process and stomach
3. Add the measurements together and mark this total distance with a small piece of tape or by marking with fingers.
4. Lubricate the first 6 inches of the OG tube liberally with a water soluble lubricant.
5. ***Oral Insertion with Endotracheal Tube***: Position the gastric tube to the back of the tongue and then direct the tube downwards through the oropharynx to the preselected depth.
6. ***Oral Insertion with iGel Airway***: Advance the lubricated 12 FR or smaller gastric tube down lumen leading to the stomach. Continue to advance until reaching the preselected depth.
7. Verify OG tube placement in the stomach by one of the following:
    a. Aspirating gastric contents with the irrigation syringe
    b. While listening over the epigastrum with a stethoscope quickly instill a 30cc air bolus with the irrigation syringe. Air entering the stomach will produce a “whooshing” sound.
    c. Begin suction, note aspiration of gastric contents
8. If unable to positively confirm that the OG tube has been placed is in the stomach the tube must be removed immediately and re-attempted if necessary.
9. Once confirmed for placement, secure the OG tube by taping it to the advanced airway tube.
10. Remember when using the **Salem Sump**, the blue pigtail must be kept at the level of the fluid in the patient’s stomach. This will prevent gastric contents from leaking back through vent lumen.
11. To deter the OG tube from dangling and possible dislodgment:
    a. Wrap a small piece of tape around the tube near the connection creating a tab.
12. When possible, the OG tube must remain connected to a low-level of suction (pull the white knob on suction unit for lower level suctioning). When suction is not available (i.e. when moving patient from unit into ER); insert the blue pigtail into the end of the Salem Sump.

SECTION FOUR

FORMULARY

Polk County Fire Rescue

MEDICATION GUIDELINES

INTRODUCTION

The following pages contain guidelines for the medications encountered by PCFR Paramedics. The list refers to the medications carried on all ALS units. They identify the name and class of the drug, a short description, indications, contraindications, and precautions,. This is only a guideline to medication administration and shall not circumvent the need to refer to the appropriate PROTOCOL or to contact Medical Control for orders and consultation. For detailed and extensive information on each drug, refer to the Physician's Desk Reference, the Advanced Cardiac Life Support text or an emergency pre-hospital pharmacology reference.

Refer to the appropriate PROTOCOL or contact Medical Control for specific dosage information.

The following medications may be stocked in specific quantities on ALS units:

Adenosine
Albuterol Sulfate
Amiodarone
Aspirin
Atropine Sulfate
Cardizem
Dextrose 50%
Diphenhydramine (Benadryl)
Dopamine
Dilaudid
Epinepherine
Glucagon
Haldol
Ipratropium Bromide(Atrovent)
Ketamine
Labetalol
Magnesium Sulfate
Midazolam(Versed)
Morphine Sulfate
Naloxone (Narcan)
Nitroglycerine Paste
Oxygen
Pepcid
Pitressin(Vasopressin)
Sodium Bicarbonate
Sodium Chloride(NS)
Succynocholine
Valium
Xopenex
Zofran

All IV piggyback medications must be placed on a micro-gtt solution set for field administration and if available, an infusion pump or rate-minder SHOULD BE UTILIZED.

Adenocard	(Adenosine)
Classification:	Antidysrhythmic agent
Actions:	Slows conduction through the AV node, can interrupt the reentry pathways through the AV node, and can restore normal sinus rhythm in patients with PSVT.
Indications:	Supra-ventricular Tachycardia
Contraindications:	2^{nd} or 3^{rd} degree heart block Sick sinus syndrome Hypersensitivity to Adenosine
Adverse effects:	Facial flushing Headache Dizziness Dyspnea Nausea/vomiting Chest pressure Transient asystole Bronchoconstriction in some asthma patients
Precautions:	A brief period of asystole (up to 15 seconds) following conversion, followed by resumption of NSR is common after rapid administration.
Onset:	Immediate
Duration:	10 seconds
Pregnancy:	Category C
Comments:	Reduced dose in heart transplant patients

Albuterol Sulfate	(Proventil, Ventolin)
Classification:	Sympathetic Bronchodilator
Actions:	Relaxes bronchial smooth muscle by stimulating beta2 receptors resulting in bronchodilation.
Indications:	Acute asthma Allergic reaction COPD/bronchitis Bronchospasm
Contraindications:	Prior hypersensitivity reaction to Albuterol Symptomatic tachycardia Chest pressure HR > 150 Ventricular Ectopy
Adverse effects:	Tachycardia Hypertension Palpitations Dizziness Dysrhythmias Restlessness Nausea
Precautions:	Use in caution in patients with heart disease, hypertension, diabetes, the elderly, and those being treated with antidepressants.
Onset:	Within 5 minutes.
Duration:	3-4 hours
Pregnancy:	Category C
Comments:	Use with caution in patients with: Tachydysrhythmias Patients on MAO inhibitors Patients sensitive to sympathomimetics

Amiodarone	(Cordarone)
Classification:	Antidysrhythmic agent
Actions:	Broad spectrum antiarrhythmic. Delays the rate at which the heart repolarizes. Prolongs the action potential of the heart. Slows the speed of electrical conduction. Also causes blood vessels to dilate.
Indications:	Ventricular tachycardia with or without a pulse. Ventricular fibrillation
Contraindications:	Hypersensitivity to Amiodarone or its components including iodine. Cardiogenic shock Sinus bradycardia and 2nd or 3rd HB
Adverse effects:	Hypotension, bradycardia, arrhythmias
Precautions:	May cause worsening of arrhythmia or new May produce vasodilation and hypotension Negative inotropic effects ½ life is up to 60 days. Use with caution in renal failure May interact with beta-blockers and certain calcium channel blockers resulting in extremely low heart rates.
Onset:	2 or 3 days to 2 to 3 weeks
Duration:	10 days to several months
Pregnancy:	Category C
Comments:	Draw up slowly, Amiodarone will foam and be unusable. Flush line with NS after administration. Allergies to shellfish is usually an allergy to tropomyosin not iodine, and Amiodarone is safe is these cases.

Aspirin	(ASA, Acetylsalicylic Acid)
Classification:	Antiplatelet, Analgesic, Antipyretic, Anti-inflammatory
Actions:	Inhibition of platelet aggregation and platelet synthesis. Reduction of risk of death in patients with a history of myocardial infarction or unstable angina.
Indications:	Chest pain with suspected myocardial ischemia
Contraindications:	Allergy to ASA Peptic ulcer disease Patients who have taken ASA the last 8 hours Hypersensitivity to Salicylates
Adverse effects:	Nausea-GI upset Hepatotoxicity Occult blood loss Anaphylaxis
Precautions:	GI bleeding and irritation more likely in elderly
Onset:	30-60 minutes
Duration:	4-6 hours
Pregnancy:	Consult MD. Not recommended in 3rd trimester.
Comments:	Salicylism signs & symptoms: dizziness, tinnitis, difficulty hearing, nausea, vomiting, and mental confusion.

Atropine Sulfate

Classification:	Parasympathetic blocker (Anticholinergic)
Actions:	Inhibits parasympathetic stimulation by blocking acetycholine receptors. Decreased vagal tone resulting in increased heart rate and AV conduction. Dilates bronchioles and decreases respiratory tract secretions. Decreases gastrointestinal secretions and motility.
Indications:	Symptomatic bradycardia Asystole, PEA HR < 60 Organophosphate poisoning Pre-intubation for patients <20kg or <5 years/age Nerve agent exposure Bronchitis/Asthma/Emphysema
Contraindications:	Neonates (bradycardia and asystole/PEA in neonates is usually caused by hypoventilation; also the vagus nerve in neonates in underdeveloped and atropine will usually have no effect upon it.)
Adverse effects:	Tachycardia Increased myocardial O2 demand Headache, Dizziness Palpitations, Dries mucus membranes Nausea/vomiting, Flushed skin Dilated pupils, Increased intraocular pressure
Precautions:	Use with caution in patients with suspected AMI Will not be effective for Type II AV Block and new 3rd HB with wide QRS (in these patients may cause paradoxical slowing).
Onset:	2-5 minutes
Duration:	20 minutes
Pregnancy:	Category C
Comments:	Bradycardia in pediatrics is usually due to hypoxia. Antihistamines, phenothiazines, and Tricyclic antidepressants enhance the effects of atropine. Not recommended in asymptomatic bradycardia.

Atrovent	(Ipratropium Bromide)
Classification:	Anticholenergic Bronchodilator
Actions:	Antagonizes action of acetylcholine on bronchial smooth muscle in the lungs, causing bronchodilation.
Indications:	Bronchospasm: maintenance treatment of COPD, including chronic bronchitis and emphysema. Asthma
Contraindications:	Hypersensitivity to Atrovent, Atropine, or other Belladonna-type drugs or to soya lecithin or related food products.
Adverse effects:	Chest pain, palpitations, hypertension, and increased heart rate. Cough, exacerbation of symptoms. Nervousness, dizziness. Headache, blurred vision.
Precautions:	Narrow angle glaucoma. Elderly Cardiovascular Disease HTN
Onset:	Within 5 minutes.
Duration:	Up to 5 hours when used with Albuterol.
Pregnancy:	Category B.
Comments:	

Cardizem	(Diltiazem)
Classification:	Calcium Channel Blocker
Actions:	Diltiazem inhibits the influx of calcium ions during membrane depolarization of cardiac and vascular smooth muscle. (Relaxes smooth muscle and slows conduction thru AV node).
Indications:	PSVT: Conversion to sinus rhythm. AFib/Flutter: Temporary control of rapid ventricular rate. HTN Angina pectoris
Contraindications:	Known allergy to Cardizem, AMI, Hypotension. In Sick Sinus Syndrome, 2nd and 3rd AV Heart block (except in the presence of a functioning ventricular pacemaker). Do not use in AFib/Flutter associated with WPW or LGL syndrome. Ventricular Tachycardia
Adverse effects:	Hypotension, atrial flutter, 1st HB, 2nd HB, bradycardia, chest pain, CHF, syncope, ventricular arrhythmia, VFib, VTach, N&V, dizziness, dyspnea, headache
Precautions:	Impaired hepatic or renal function.
Onset:	Within 2-7 minutes.
Duration:	1-3 hours.
Pregnancy:	Category C.
Comments:	Do not coinfuse Cardizem with the following medications as precipitates may form: diazepam, furosemide, methylprednisolone, and sodium bicarbonate. PVCs may occur on conversion of PSVT to SR, these PVCs are transient and are typically considered to be benign.

Dextrose 50%	(D50, Glucose)
Classification:	Hyperglycemic agent, hypertonic solution Carbohydrate
Actions:	Provides immediate source of glucose, which is rapidly utilized for cellular metabolism.
Indications:	Altered level of consciousness due to suspected hypoglycemia.
Contraindications:	None
Adverse effects:	CVA Inter-cerebral hemorrhage Thrombophlebitis Rhabdomyolsis May worsen Wernicke's Encephalopathy
Precautions:	Ensure adequate and patent venous access Increased ICP, ½ dose in CVA
Onset:	30-60 seconds
Duration:	Hypoglycemic level dependant
Pregnancy:	Category A
Comments:	Causes tissue necrosis if injected into interstitial space. Dilute 50:50 with normal saline for D25. Dilute 5:1 with normal saline for D10.

Dilaudid	(Hydromorph)
Classification:	Narcotic Analgesic
Actions:	Produces analgesia by inhibiting the ascending pain pathways. Depresses CNS by interacting with receptors in the brain. Causes venous pooling due to peripheral vasodilation resulting in decreased systemic vascular resistance and decreased venous return. Decreases myocardial O2 Demand
Indications:	Pain Management Extremity Trauma
Contraindications:	Hypersensitivity Patients with ASOC (altered state of consciousness) Pain of unknown etiology Patients at risk of respiratory depression Head injury Hypovolemia SBP < 100mmHg Multi-system trauma
Adverse effects:	Respiratory depression, Hypotension, AMS
Precautions:	Opioid analgesics may cause psychological and physical dependence
Onset:	1-5 minutes IV, 15-30min IM
Duration:	3-5 hours
Pregnancy:	Category C
Comments:	Naloxone should be readily available to counteract

Diphenhydramine	(Benadryl)
Classification:	Antihistamine
Actions:	Competes with histamines at receptor sites Reverses muscle spasms associated with dystonic reactions (phenothiazines).
Indications:	Allergic reactions Dystonic reactions
Contraindications:	Glaucoma Acute Asthma COPD
Adverse effects:	Hypotension Drowsiness Tachycardia Bradycardia Dry mouth
Precautions:	Severe reactions occur more often in elderly
Onset:	1-5 minutes
Duration:	3-4 hours
Pregnancy:	Category C
Comments:	May cause depressed level of consciousness in elderly patients. Overdoses may result in seizures, coma, and death.

Dopamine	(Intropin)
Classification:	Sympathomimetic agent (Catecholamine)
Actions:	**Low dose:** (1-5 mcg/kg/min) Dilates renal and mesenteric arteries by stimulating dopaminergic receptors. May decrease BP due to vasodilation. **Moderate dose:** (5-10mcg/kg/min) Increases inotropy (force) without increasing chronotropy (heart rate). Increased BP by stimulating beta1 receptors. **High dose:** (over 10-20mcg/kg/min) Causes vasoconstriction, increases inotropy and chronotropy. Increases BP by stimulating alpha and beta1 receptors.
Indications:	Cardiogenic shock Distributive shock
Contraindications:	Hypovolemia
Adverse effects:	Hypertension (high doses) Hypotension (low doses) Tachycardia Dyspnea
Precautions:	
Onset:	5 minutes
Duration:	5-10 minutes
Pregnancy:	Category C
Comments:	Causes tissue necrosis if injected into interstitial space. MAO inhibitors may increase the effects of dopamine.

Epinephrine Hydrochloride	(Adrenaline)
Classification:	Sympathomimetic agent (Catecholamine)
Actions:	Acts directly on Alpha and Beta-receptors of the SNS. Beta effect more profound than Alpha, including: Increased chronotropy, inotropy, and dromotropy Increased systemic vascular resistance Increased BP Increased bronchial smooth muscle dilation
Indications:	Ventricular fibrillation, asystole, Pulseless V-Tach, PEA Allergic reaction/anaphylaxis Asthma Refractory pediatric bradycardia, unresponsive to oxygen and ventilation
Contraindications:	Hypertension/Hypovolemic shock/Hypersensitivity
Adverse effects:	Hypertension-tachycardia Increases myocardial oxygen demand and potentially increases myocardial ischemia
Precautions:	Pts with cardiac insufficiency
Onset:	Immediate if given IVP 5-10 minutes if IM/SQ
Duration:	3-5 minutes if given IVP 20 minutes if IM/SQ
Pregnancy:	Category C

Glucagon	(GlucaGen)
Classification:	Hyperglycemic agent, Insulin Antagonist Pancreatic Hormone
Actions:	Elevates blood glucose by converting liver glycogen into glucose Increases cardiac output by increasing inotropy and chronotropy
Indications:	Hypoglycemia without IV access Beta Blocker OD
Contraindications:	No significant CI in the above situations
Adverse effects:	Nausea/vomiting
Precautions:	Has a positive chronotropic and inotropic effect on the heart Unstable hypoglycemic patients may not respond Renal Disease, CAD
Onset:	1-3 minutes IVP 5-20 minutes IM
Duration:	15-20 minutes IVP 15-30 minutes IM/IN
Pregnancy:	Category B
Comments:	Use with caution in patients with cardiovascular disease. Move to precaution

Haldol	(Haloperidol)
Classification:	Anti-psychotic. Antipsychotic/Neuroleptic
Actions:	Acts on CNS to depress subcortical areas, mid-brain, and ascending Reticular Activating System. Block Dopamine receptors in the brain
Indications:	Acute psychotic disorders. Severe behavior problems in children. May be used in stimulant overdoses
Contraindications:	Hypersensitivity. Agitation secondary to hypoxia or shock. Not to be used in sedative overdoses
Adverse effects:	May cause mental, respiratory, and cardiovascular depression. Hypotension. EKG changes with IV use (Torsades de Pointe) Restlessness, Insomnia, Drowsiness, Seizures, Tachycardia
Precautions:	Be prepared to ventilate. Extreme caution with Parkinsonism patients. Anticoagulatory Therapy
Onset:	Sedation may occur in minutes; antipsychotic may take hours, days, or weeks
Duration:	12 to 24 hours, but may persist for days
Pregnancy:	Category C
Comments:	Use caution in elderly patients.

Ketamine	(Ketalar)
Classification:	Nonbarbiturate Anesthetic
Actions:	Dissociative anesthetic with analgesic and hallucinogenic properties
Indications:	General anesthesia in conjunction with other DAI medications Subanesthetic for conscious IO placement
Contraindications:	Hypersensitivity, Severe untreated hypertension, penetrating eye injury
Adverse effects:	Nausea/vomiting Increased ICP Increased heart rate Increased blood pressure Hallucinations Abnormal behavior
Precautions:	Make sure DAI medications are prepared prior to induction
Onset:	IV 30 seconds/ IM 3-4 minutes
Duration:	IV 10 to 20 Minutes/ IM 30 – 45 minutes
Pregnancy:	Category B
Comments:	Catecholamine release has temporary effect on heart rate and blood pressure

Labetalol	(Normadyne, Trandate)
Classification:	Antihypertensive, Nonselective Beta Blocker
Actions:	Selectively blocks alpha-receptors and nonselectively blocks beta-receptors. The alpha blocking actions lead to general vasodilation and reduced peripheral vascular resistance. The net cardiovascular effects are a decrease in blood pressure without reflex tachycardia or significant reduction in heart rate.
Indications:	Hypertensive emergency
Contraindications:	Asthma, COPD Bradycardia Hypotension CHF or cardiogenic shock Heart block > 1st degree
Adverse effects:	Dizziness, headache, and fatigue Postural hypotension, angina, bradycardia, and CHF Nausea and vomiting Wheezing, dyspnea, increased airway resistance, and bronchospasm.
Precautions:	Use with caution in patients taking antihypertensive agents. Monitor vital signs, EKG, and lung sounds. Be alert for signs of CHF, heart block, bradycardia, postural hypotension, or bronchospasm.
Onset:	Usually within 5 minutes.
Duration:	3-6 hours
Pregnancy:	Category C
Comments:	Labetalol is passed in human breast milk; use in nursing mothers should be done cautiously.

FOR USE IN SPECIFIC APPLICATIONS ONLY IN PLACE OF VERSED WHEN ADVISED

Valium	(Diazepam)
Classification:	Benzodiazepines, CNS depressant Nonbarbituate sedative/hypnotic Anticonvulsant, Anti-anxiety
Actions:	Act on the brain and nerves (central nervous system) to produce a calming effect. It works by enhancing the effects of a certain natural chemical in the body (GABA).
Indications:	Seizures, Status Epilecticus, acute anxiety states, skeletal muscle relaxant, management of alcohol withdrawl
Contraindications:	Hypersensitivity, use of other CNS depressants, hypotension & various states of shock
Adverse effects:	Headache to cardiac arrest! Respiratory depression, apnea & hypotension. Dizziness, ataxia, fatigue, confusion and transient drowsiness.
Precautions:	Caution with hepatic dysfunction, renal insufficiency or history of drug addiction. Elderly/debilitated may require reduced dosage.
Onset:	1-5 minutes
Duration:	15-60 minutes
Pregnancy:	Category D

Magnesium Sulfate	($MgSO_4$)
Classification:	Antidysrhythmic, Electrolyte Electrolyte, Anticonvulsant
Actions:	Controls ventricular response rate Increased movement of potassium into cells Blocks release of acetylcholine
Indications:	Torsades de Pointes Seizures secondary to eclampsia Severe Asthma Preterm Labor
Contraindications:	Hypersensitivity Sinus bradycardia Pediatrics Severe HTN 3rd degree HB Dialysis
Adverse effects:	Hypotension Hypertension Dysrhythmias Facial flushing Diaphoresis Depressed reflexes Bradycardia
Precautions:	May cause circulatory collapse, or cardiac and respiratory depression. Use with caution in Renal Deficiency
Onset:	Immediate
Duration:	30 min. IV, 3-4 hours IM
Pregnancy:	Category A

Midazolam	(Versed)
Classification:	Short acting benzodiazepine, CNS depressant
Actions:	Reduces anxiety, depresses CNS function, induces amnesia.
Indications:	Pre-synchronized cardioversion External cardiac pacing Seizures refractory to Valium Sedation for drug assisted intubation
Contraindications:	Hypersensitivity Hypotension (MAP <70mmHG)
Adverse effects:	Hypotension Respiratory depression Headache Nausea Brady/Tachy, PVCs, AMS Laryngo/Bronchial Spasms Dyspnea, Drowsiness
Precautions:	
Onset:	IV/IO: 3-5 minutes dose dependent IM/IN: Within15 minutes
Duration:	2-6 hours dose dependent
Pregnancy:	Category D
Comments:	May cause apnea, especially in children/elderly Effects intensified by ETOH and other CNS depressants. Be prepared to support respirations. Carefully monitor V/S including EKG & pulse Ox 3 to 4 times stronger than Valium

Morphine Sulfate	(MSO4, MS)
Classification:	Narcotic analgesic
Actions:	Produces analgesia by inhibiting the ascending pain pathways. Depresses CNS by interacting with receptors in the brain. Causes venous pooling due to peripheral vasodilation resulting in decreased systemic vascular resistance and decreased venous return. Decreases myocardial O2 Demand
Indications:	Moderate to severe pain Extremity trauma Chest pain, Pulmonary Edema
Contraindications:	Patients with ALOC Abdominal Pain Pain of unknown etiology Patients at risk of respiratory depression Head injury Hypovolemia SBP < 100mmHg Multi-system trauma
Adverse effects:	Respiratory depression Hypotension Seizures Bradycardia Altered mental status
Precautions:	CNS depression is enhanced with antihistamines, antiemetics, sedatives, hypnotics, barbiturates
Onset:	Immediate
Duration:	3-5 hours
Pregnancy:	Category C
Comments:	Naloxone should be readily available to counteract MS if necessary

Naloxone	(Narcan)
Classification:	Narcotic antagonist
Actions:	Reverses the effect of narcotics by competing for opiate receptor sites in the CNS.
Indications:	Suspected narcotic overdose with respiratory depression. Altered level of consciousness with respiratory depression.
Contraindications:	None.
Adverse effects:	Hypertension Tremors Nausea/vomiting Dysrhythmias Diaphoresis
Precautions:	May induce withdrawal including the newborns of mothers with narcotic dependence. Half life is less that most narcotics. Patient may return to overdose state.
Onset:	Immediate, up to 5 minutes via IM/IN
Duration:	20-30 minutes
Pregnancy:	Category B
Comments:	The goal is to improve respiratory drive, NOT to return patient to their full mental capacity. Rapid reversal of narcotic effects may lead to combative behavior. May not reverse hypotension. Observe for seizures, hypertension, CP, and severe headache. Use caution in newborns.

Nitrobid	(Nitropaste, NTG)
Classification:	Vasodilator
Actions:	Dilates arterial and venous vessels resulting in venous pooling. Reduces preload and afterload resulting in decreased myocardial workload and reduced oxygen demand. Relaxes all smooth muscle Dilates coronary vessels resulting in increased perfusion of the myocardium Relieves coronary vasospasm
Indications:	Chest pain of suspected myocardial origin Congestive heart failure/cardiogenic pulmonary edema.
Contraindications:	Signs/symptoms of neurological deficit. SBP < 100 mmHg. Recent use of Viagra®, Cialis®, or Levitra® within the last 24 hours.
Adverse effects:	Hypotension. Nausea/vomiting. Headache. Postural syncope.
Precautions:	Proper BSI precautions should be taken during administration. See comments
Onset:	1-3 minutes.
Duration:	20-30 minutes.
Pregnancy:	Category C
Comments:	Healthcare provider may experience adverse effects if accidentally handled or absorbed.

Oxygen	(O2)
Classification:	Gas
Actions:	Oxidizes glucose to provide energy at the cellular level. Essential for normal metabolic function.
Indications:	Whenever oxygen demands may be increased.
Contraindications:	Not significant in the above situation.
Adverse effects:	Not significant in the above situation.
Precautions:	Avoid smoking
Onset:	Immediate.
Duration:	Up to 30 minutes
Pregnancy:	Category A
Comments:	Oxygen therapy should never be withheld from a patient in respiratory distress.

Pepcid	(Famotidine)
Classification:	Histamine H2 – Receptor Antagonist
Actions:	Competitively inhibits the action of histamine at the histamine H2-receptors. This antihistamine property functions to inhibit gastric acid secretion, and to inhibit the action of histamine from contributing to anaphylactoid reactions and/or anaphylaxis
Indications:	**Allergic / Anaphylactic Reactions:** in adult and pediatric patients. Famitodine is indicated even in the presence of hypotension **GI Bleeding:** in adult patients not to be used for pediatric GI bleeding
Contraindications:	Known hypersensitivity
Adverse effects:	Rare instances of arrhythmias and hypotension have been reported following rapid IV bolus.
Precautions:	Administer with a Slow IV Push over 2 minutes
Onset:	Within one hour
Duration:	10 to 12 hours
Comments:	Supplied as 20 mg/2 cc

Pitressin	(Vasopressin)
Classification:	Antidiuretic hormone
Actions:	Directly stimulates smooth muscle V1 receptors resulting in vasoconstriction.
Indications:	Cardiac arrest.
Contraindications:	Hypersensitivity.
Adverse effects:	Ischemic chest pain Abdominal distress N/V Tremors Bronchial constriction Uterine contraction Sweating
Precautions:	Severe hepatic disease. Seizure disorder. Congestive Heart Failure. Impaired kidney function. Asthma. Migraines. Elderly patients.
Onset:	Immediate
Duration:	Variable
Pregnancy:	Category C
Comments:	

Sodium Bicarbonate	($NaHCO_3$)
Classification:	Alkalinizing agent
Actions:	Combines with hydrogen ions to form carbonic acid, increases blood pH.
Indications:	Overdose of Tricyclic antidepressants. Prolonged Arrest
Contraindications:	Not significant in the above situation.
Adverse effects:	Metabolic alkalosis Pulmonary edema
Precautions:	May deactivate vasopressors
Onset:	Immediate.
Duration:	30-60 minutes.
Pregnancy:	Category C
Comments:	Flush IV tubing before and after administration.

Sodium Chloride	(Normal Saline)
Classification:	Isotonic solution
Actions:	Replaces fluid and electrolytes lost from the intravascular and intracellular spaces.
Indications:	Initial fluid replacement in hypovolemia and dehydration. Intravenous access for drug administration.
Contraindications:	Not significant in the above situations.
Adverse effects:	Circulatory fluid volume overload.
Precautions:	
Onset:	Immediate.
Duration:	Remains in intravascular space less than an hour.
Pregnancy:	Category A
Comments:	Monitor infusion rate closely and auscultate lung sounds prior to administration.

Succinylcholine	(Anectine)
Classification:	Neuromuscular blocker (depolarizing)
Actions:	Depolarizing neuromuscular block.
Indications:	Rapid muscle paralysis.
Contraindications:	Hypersensitivity. Hyperkalemia. Penetrating eye injury. Malignant hyperthermia. Burns, multiple trauma, and soft tissue injuries > 24 hours old. Suspected fractured larynx that prevents proper performance of Sellick's maneuver.
Adverse effects:	Dysrhythmias. Prolonged apnea, respiratory depression, or bronchospasm. Increase in serum potassium. ICP. Inability to perform adequate neurological exam.
Precautions:	Make sure all meds prepared prior to induction. Measures to control anxiety and pain must be utilized.
Onset:	30-90 seconds
Duration:	4-5 minutes.
Pregnancy:	Category C
Comments:	If consistent and dramatic temperature rise is observed, utilize whatever means available to lower patients temperature. Muscle relaxation order: (eyelids-jaw-limbs-abdominals-diaphrgam-intercostal muscles) No effect on consciousness Enhanced by Lidocaine, Procainamide, Beta Blockers, and Mag sulfate

Xopenex	(Levalbuterol)
Classification:	Bronchodilator
Actions:	Stimulates beta-2 adrenergic receptors (selective beta agonist)
Indications:	Bronchospasms associated with restrictive airway diseases including asthma and COPD
Contraindications:	Hypersensitivity to drug/class or components. MAO inhibitor use within 14 days Not approved in children < 6 years of age
Adverse effects:	Paradoxical bronchospasms Possible EKG changes • flattening t waves • Prolonged QT interval • ST segment depression
Precautions:	Caution with arrhythmias, CAD, and HTN
Dosage:	0.63 mg via nebulizer.
Onset:	5-15 minutes post inhalation
Duration:	3 to 4 hours
Comments:	Not for use in children < 6 years old

Zofran	(Ondansetron)
Classification:	Antinausea, antiemetic
Actions:	Blocks serotonin, both peripherally on vagal nerve terminals and centrally in chemoreceptor trigger zone.
Indications:	Patients experiencing nausea and vomiting.
Contraindications:	There are no absolute contraindications to the use of Zofran.
Adverse effects:	Overdose may produce a combination of CNS stimulation or depressant effects. Frequently may cause: anxiety, dizziness, drowsiness, headache, fatigue, constipation, diarrhea, hypoxia, and urinary retention. Occasionally may cause: abdominal pain, fever, feeling of cold, paresthesia, and weakness.
Precautions:	None.
Onset:	IV: Rapid; IM: Rapid
Duration:	IV: 4 to 8 hours; IM: Unknown
Pregnancy:	Category B
Comments:	

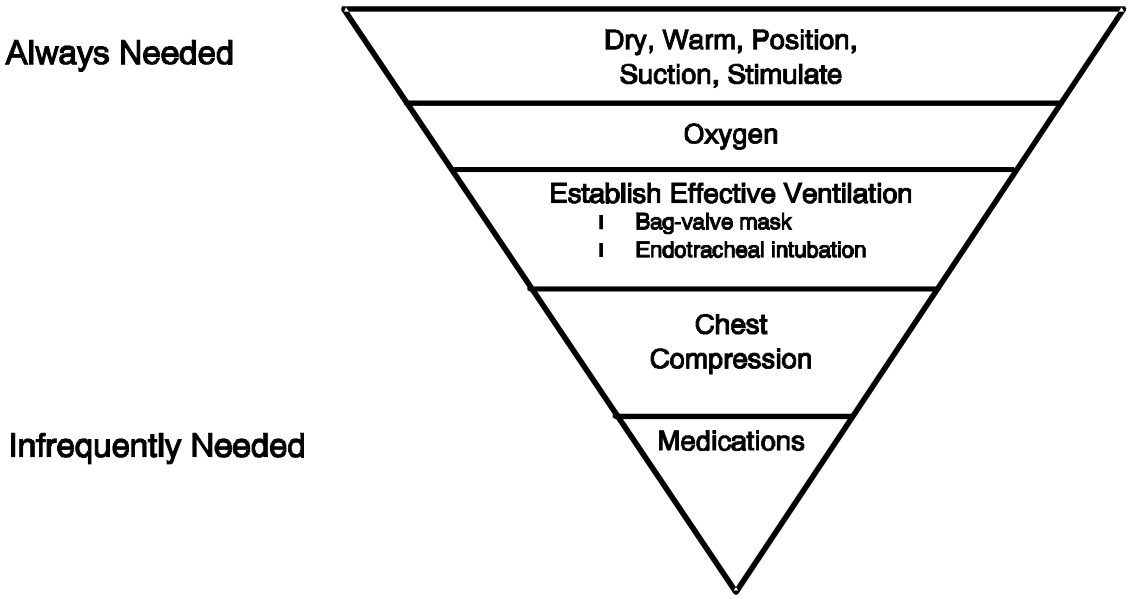
SECTION FIVE

APPENDICIES

APPENDICES
APGAR

Sign	0	1	2
Appearance	Pale / blue	Pink body, blue extremities	Pink body, pink extremities
Pulse	Absent	Less than 100	100 or greater
Grimace	No response	Grimace	Cough, sneeze
Activity	Limp	Some flexion	Action
Respiratory effort	Absent	Slow, irregular	Strong crying

Assess and Support: Temperature (warm and dry)
Airway (position and suction)
Breathing (stimulate to cry)
Circulation (heart rate and color)



Inverted pyramid reflecting relative frequencies of neonatal resuscitation efforts for the newborn who does not have meconium-stained amniotic fluid. Note that a majority of newborns resopnd to simple measures.

APPENDICES
DOPAMINE DRIP CHART

- **Dopamine drip: 400mg in 250ml D5W: 1600mcg/ml solution.**

Weight kg / (lbs)	5mcg/kg/min	10mcg/kg/min	15mcg/kg/min	20mcg/kg/min
2.5 / (5.5)	-	1	1	2
2.7 / (6)	-	1	2	2
3.2 / (7)	-	1	2	2
3.6 / (8)	-	1	2	3
4 / (9)	-	1	2	3
4.5 / (10)	-	2	3	3
5 / (11)	1	2	3	4
10 / (22)	2	4	6	8
20 / (44)	4	8	11	15
30 / (66)	6	11	17	23
40 / (40)	8	15	23	30
50 / (110)	9	19	28	38
60 / (132)	11	23	34	45
70 / (154)	13	26	39	53
80 / (176)	15	30	45	60
90 / (198)	17	34	51	68
100 / (220)	19	38	56	75
110 / (242)	21	41	62	83
120 / (264)	23	45	68	90

APPENDICES
GLASGOW COMA SCALE

ADULT					
Motor Response		**Eye Opening**		**Verbal Response**	
Obeys Commands	6	Spontaneous	4	Oriented	5
Localizes	5	To voice	3	Confused	4
Withdrawal	4	To pain	2	Inappropriate	3
Flexion	3	None	1	Incomprehensible	2
Extension	2			None	1
None	1				

CHILD					
Recommended for ages 4 year to adult					
Motor Response		**Eye Opening**		**Verbal Response**	
Obeys Commands	6	Spontaneous	4	Oriented and converses	5
Localizes	5	Verbal command	3	Disoriented and converses	4
Withdrawal	4	To pain	2	Inappropriate	3
Flexion - Withdrawal	3	No response	1	Incomprehensible	2
Flexion - Abnormal	2			None	1
None	1				

INFANT					
Recommended for birth to age 4					
Motor Response		**Eye Opening**		**Verbal Response**	
Spontaneous	6	Spontaneous	4	Smiles, oriented to sound,	5
				Interacts: Appropriate	
Localized pain	5	Reaction to speech	3	Crying: Consolable	4
				Interacts: Inappropriate	
Withdraws in response	4	Reaction to pain	2	Crying: Inconsistently consolable	3
to pain				Interacts: Restless	
Abnormal Flexion in	3	No response	1	Crying: Inconsolable	2
response to pain				Interacts: Restless	
Abnormal extension in	2			Crying: No response	1
response to pain				Interacts: No response	
No response	1				

APPENDICES

LEMON - Difficult Airway Evaluation

Evaluating for the difficult airway

Between 1 – 3% of patients who require endotracheal intubation have airways that make intubation difficult. Recognizing those patients who may have a difficult airway allows the Paramedic to proceed with caution and to keep as many options open as possible. It also allows the Paramedic to prepare additional equipment (such as a cricothyrotomy kit) that may not ordinarily be part of a standard airway kit. The pneumonic LEMON is useful in evaluating patients for signs that may be consistent with a difficult airway and should raise the Paramedic's index of suspicion.

Look externally

External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, extreme cachexia, edentulous mouth, facial trauma, obesity, large front teeth or “buck teeth”, high arching palate, receding mandible, short bull neck.

Evaluate 3-3-2 Rule

3 fingers between the patient’s teeth (patient’s mouth should open adequately to permit three fingers to be placed between the upper and lower teeth)
3 fingers between the tip of the jaw and the beginning of the neck (under the chin)
2 fingers between the thyroid notch and the floor of the mandible (top of the neck)

Mallampati

This scoring system is based on the work of Mallampati et al published in the Canadian Anesthesia Society Journal in 1985. The system takes into account the anatomy of the mouth and the view of various anatomical structures when the patient opens his mouth as wide as possible. This test is performed with the patient in the sitting position, the head held in a neutral position, the mouth wide open, and the tongue protruding to the maximum. Inappropriate scoring may occur if the patient is in the supine position (instead of sitting), if the patient phonates or if the patient arches his or her tongue.

Class I (easy) = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.
Class II = visualization of the soft palate, fauces and uvula.
Class III = visualization of the soft palate and the base of the uvula.
Class IV (difficult) = soft palate is not visible at all.

Obstruction?

Besides the obvious difficulty if the airway is obstructed with a foreign body, the Paramedic should also consider other obstructers such as tumor, abscess, epiglottis, or expanding hematoma.

Neck Mobility

Ask the patient to place their chin on their chest and to tilt their head backward as far as possible. Obviously, this will not be possible in the immobilized trauma patient.

APPENDICES
PEDIATRIC / CHILDREN VITAL SIGNS

		Blood Pressure			
Age	**Respiratory**	**Systolic**	**Diastolic**	**Pulse**	**Weight (lb)**
Neonate	60	80	46	110 - 150	6.6
3 months	40	89	60	110 - 140	11
6 months	30	89	60	100 - 140	16.5
1 year	25	89	60	100 - 140	22
2 years	20	96	84	90 - 100	27.5
3 years	20	100	70	80- 120	33
4 years	20	100	70	80 - 100	39.6
5 years	20	100	70	80 - 100	44
6 years	20	100	56	80 - 100	55
10 years	15	114	60	70 - 110	

APPENDICES
MODIFIED RANKIN SCALE (MRS)

Score	Description
0	No symptoms at all
1	No significant disability despite symptoms; able to carry out all usual duties and activities
2	Slight disability; unable to carry out all previous activities, but able to look after own affairs without assistance
3	Moderate disability; requiring some help, but able to walk without assistance
4	Moderately severe disability; unable to walk without assistance and unable to attend to own bodily needs without assistance
5	Severe disability; bedridden, incontinent and requiring constant nursing care and attention
6	Dead

TOTAL (0–6): _____

APPENDICES
IV tPA EXCLUSION CRITERIA

HEAD TRAUMA, STROKE, OR ACUTE MI WITHIN LAST 3 MONTHS??

MAJOR SURGERY WITHIN 14 DAYS:??

GI OR URINARY TRACT HEMORRHAGE WITHIN 21 DAYS??

HISTORY OF INTRACEREBRAL HEMORRHAGE:??

SEIZURE WITNESSED:??
SYMPTOMS ACCOMPANIED BY EXPLOSIVE HEADACHE??

DOES PATIENT HAVE CARDIAC ARRHYTHMIAS???

IS PATIENT ON BLOOD THINNERS???

CPR / CHEST COMPRESSIONS IN LAST TEN DAYS???

SBP >185 OR DBP > 110???

ARTERIAL PUNCTURE AT NON-COMPRESSIBLE SITE WITHIN 7 DAYS??

LAST SEEN NORMAL < 4.5 HRS??

APPENDICES
HANDTEVY METHOD

The 7 Handtevy Method Rules *(To determine volume to be administered)*

1. **Epinephrine (1:1000)**
   Take weight in kg, move decimal 2 places to the left
   20 kg = 0.20 mL

2. **Epinephrine (1:10,000)**
   Take weight in kg; move decimal 1 place to the left
   20 kg = 2.0 mL

3. **Amiodarone**
   Take weight in kg; move decimal 1 place to the left (Same rule as Epinephrine 1:10,000)
   20 kg = 2.0 mL

4. **Sodium Bicarbonate**
   Take weight in kg; administer exact amount in mL
   20 kg = 20 mL

5. **Dextrose 25% (Dilute if using $D_{50}W$)**
   Take weight in kg; multiply by 2, administer amount in mL
   20 kg = 40 mL

6. **Fluids (NS & LR)**
   Take weight in kg; multiply by 2, then add a 0 to the end
   20 kg = 400 mL

7. **Valium**
   Uses rule based on age; administer 0.4 mL, administer for each additional year add 0.1 mL
   1 year old = 0.4 mL (this is a constant)
   4 year old = 0.7 mL (0.4 + 0.1 + 0.1 + 0.1 = 0.7) [Age + 3 x 0.1]

Polk County Fire Rescue

STROKE ALERT

Date _____ Time: _____ Unit #: _____ Age: _____ Sex: ☐ Male ☐ Female

Patient's Name: _____ Incident Number: _____

Event Witness Name: _____ Cell#: _____ Home #: _____

Closest Relative (if different than above): _____ Cell #: _____ Home #: _____

Cincinnati Stroke Scale (FAST)
Check if abnormal

☐ **F** **(Face)** Facial Droop: Have patient smile or show teeth. (Look for asymmetry)

Normal: Both sides of the face move equally or not at all
Abnormal: One side of the patient's face droops

☐ **A** **(Arm)** Motor Weakness: Arm drift (close eyes, extend arms, palms up)

Normal: Arms remain extended equally, drift equally, or do not move at all
Abnormal: One arm drifts down when compared with the other

☐ **S** **(Speech)** Speaking: "You can't teach an old dog new tricks." (Repeat phrase)

Normal: Phrase is repeated clearly and correctly
Abnormal: Words are slurred (dysarthria), abnormal (aphasia), or none

☐ **T** **(Time)** **TIME LAST SEEN NORMAL:** _____

If F, A, or S above are checked, consider patient to be a possible STROKE ALERT.
Complete stroke alert and destination criterion to confirm alert status and destination need.
Begin Transport IMMEDIATELY to the appropriate facility

Section 1 should be used to confirm alert status for patients presenting with the signs / symptoms of acute stroke.

Please check the appropriate box(es)

Section 1:

☐ Time last seen normal > 8 hours - Including Stroke on awakening from sleep
☐ Improving or Resolution of signs / symptoms (TIA) prior to transport
☐ Rankin Score > 3 (unable to walk and unable to attend to own bodily needs without assistance)
☐ DNR order present or Terminal illness (end stage cancer, end stage AIDS, severe Dementia)
☐ Unstable vital signs not readily controlled (hypotension, arrhythmias, apnea, etc.) or Blood Glucose < 50

Are any items in **Section 1** checked?

YES: Transport to the closest Stroke Facility (PSC).

NO: Proceed to **Section 2**.

Section 2:

Stop

Is the patient permenently bed or wheelchair confined, do they require **constant** care OR is assistance **essential** for activities of daily living ***prior to today's event***?

YES: **TRANSPORT TO PRIMARY STROKE CENTER (PSC)**

NO: **Proceed to Section 3**

Sections 3 & 4 should be used to confirm destination criterion for Stroke Alert patients.

Section 3:

Los Angeles Motor Scale
Please check the appropriate box(es)

Symptom		Score
Facial Droop	Absent……..	☐ - 0
	Present……	☐ - 1
Arm Drift	Absent……..	☐ - 0
	Drifts Down……..	☐ - 1
	Falls Rapidly……....	☐ - 2
Grip Strength	Normal……..	☐ - 0
	Weak Grip……	☐ - 1
	No Grip……	☐ - 2
	Total	_____

Stop

☐ **Score = 5 – TRANSPORT TO COMPREHENSIVE STROKE CENTER (CSC)**

☐ **Score = 4 –** Proceed to Section 4

☐ **Score ≤ 3 – TRANSPORT TO PRIMARY STROKE CENTER (PSC)**

Section 4: **Please check the appropriate box(es)**

☐ > 3 hours since time last seen normal
☐ Seizure at onset
☐ SAH symptoms = Sudden worst headache ever, GCS<8, seizure, sudden witnessed LOC, BP>220/120
☐ Patient is on any of the following blood thinners: Coumadin or Jantoven (warfarin), Pradaxa (dabigatran), Xarelto (rivaroxaban), Lovenox (enoxaparin), Eliquis (apixaban), Pletal (cilostazol), Arixtra (fondaparinux), Aggrastat (tirofiban hydrochloride), Agrylin (anagrelide), Fragmin (dalteparin)

☐ Recent (within 14 days) or current bleeding, trauma, surgery, or invasive procedure

☐ Active internal bleeding and or clotting disorders (history of GI / GU bleeding within last 21 days)

☐ Pregnancy or completion / termination of pregnancy < 30 days

☐ Intracranial pathology (Tumor, Aneurysm, ArterioVenous Malformation (AVM), Intracranial hemorrhage or surgery and intraspinal surgery)

Stop

Are any items in **Section 4** checked?

YES: **TRANSPORT TO A COMPREHENSIVE STROKE CENTER (CSC)**

NO: Transport to a **PRIMARY STROKE CENTER (PSC) by Ground**

All strokes meeting criteria for transport to a Comprehensive Stroke Center will be transported utilizing the following criteria:

a. If time last seen normal is greater than 5 hours but less than 7 hours – **FLY** to Comprehensive Stroke Center.

b. If time last seen normal is less than 5 hours – **GROUND** to Comprehensive Stroke Center.

Polk County Fire Rescue

SEPSIS ALERT

Date: Unit #: Age: Sex: ☐ Male ☐ Female

Patient's Name: Incident Number:

CHECK "YES" OR "NO" FOR THE FOLLOWING

☐ YES	☐ NO	**Blood Pressure: SBP < 90 mm or DBP < 60** **OR** **Respiratory Rate: < 10 or > 20 breaths per minute** **OR** **Pulse rate : < 60 or > 90 beats per minute** **OR** **Temperature: < 97.8 or > 99.1 degrees Fahrenheit**
☐ YES	☐ NO	**The patient has 2 or more of the following SIRS variables:** _____: Temperature of > 38 C (100.4 F) or < 36 C (96.8F) _____: HR of > 90/min _____: Respiratory rate > 20/min **_____: Is there currently a documented infection such as: *Pneumonia, UTI, MRSA, or is the patient at high risk such as Nursing home or Cancer patients, indwelling catheters, immune compromised, etc.***
☐ YES	☐ NO	**The patient has a Shock Index of > 1** ▪ *Shock Index = Heart Rate / Systolic BP* **---- *OR* ----** **The patient has a Modified Shock Index of < 0.7 or > 1.3** ▪ *Modified Shock Index = Heart Rate / MAP*

If any of the above is "NO" the patient is NOT a Sepsis Alert

APPENDICES

IDEAL BODY WEIGHT CHART

Height	Weight in lbs	Weight in kg
4’10”	119	54
4’11”	124	56
5’0”	128	58
5’1”	132	60
5’2”	137	62
5’3”	141	64
5’4”	146	66
5’5”	150	68
5’6”	155	70
5’7”	160	72
5’8”	164	74
5’9”	169	76
5’10”	174	79
5’11”	179	81
6’0”	184	83
6’1”	189	85
6’2”	195	88
6’3”	200	90
6’4”	205	93
6’5”	211	95
6’6”	216	98
6’7”	222	100
6’8”	230	104
6’9”	238	108
6’10”	246	111
6’11”	254	115
7’0”	262	119

APPENDICES

TOXINS AND ANTIDOTE CHART

NOTE: The following list is for informational purposes only and is not inclusive of all toxins. Always contact Poison Control for definitive treatment instructions.

Toxins or Overdose Indications	Antidote
Acetaminophen	Acetylcysteine (Mucomyst ™, Acetadote ™)
Alpha$_2$ agonists	Atropine Sulfate
Anticoagulants, anticoagulant rodenticides, warfarin	Phytonadione (Vitamin K_1)
Arsenic, copper, gold, lead, and mercury	Dimercaprol
Aspirin (ASA)	Activated charcoal, Alkaline diuresis, Sodium Bicarbonate
Barbiturate	Alkaline diuresis
Benzodiazepine poisoning	Flumazenil (Romazicon ™)
Beta blockers	Glucagon and intralipids
Black Widow Spiders	Latrodectus mactans antivenom
Calcium Channel Blockers	Calcium Gluconate, Glucagon, insulin
Chloroquine and related antimalarial drugs	Diazepam
Chlorine gas	Sodium Bicarbonate (nebulized)

Cocaine, PCP, methamphetamine	Diazepam
Toxins or Overdose Indications	**Antidote**
Coral Snake	Panamerican serum
Cyanide	Cyanide Antidote Kit (Amyl nitrite, sodium nitrite and sodium thiosulfate), Hyperbaric oxygen
Digoxin	Digoxin Immune Fab (Digibind, Digifab)
Phenothiazine induced extrapyramidal symptoms/dystonic reactions	Diphenhydramine HCL, Cogentin
Ethanol, Ethylene glycol, Wernicke-Korsakoff syndrome	Thiamine
Hyperkalemia	Calcium Gluconate, Insulin, D50, Albuterol, loop diuretics, and Sodium Bicarbonate
Heparin	Protamine
Insecticides (i.e. dichlorvos, malathion and parathion)	Atropine Sulfate
Malignant hyperthermia, neuroleptic malignant syndrome	Dantrolene (Dantrium™)
Nerve agents (i.e. Sarin, Soman, Tabun, and VX)	Atropine Sulfate, Pralidoxime chloride (2-PAM chloride)
Opiates and Clonidine	Naloxone
Organophosphates	Atropine sulfate
Pit Vipers	Cro-Fab
Serotonin Syndrome	Diazepam, Cyproheptadine HCl (Periactin)
Tricyclic antidepressants	Sodium Bicarbonate

EMS Guide
January 2013

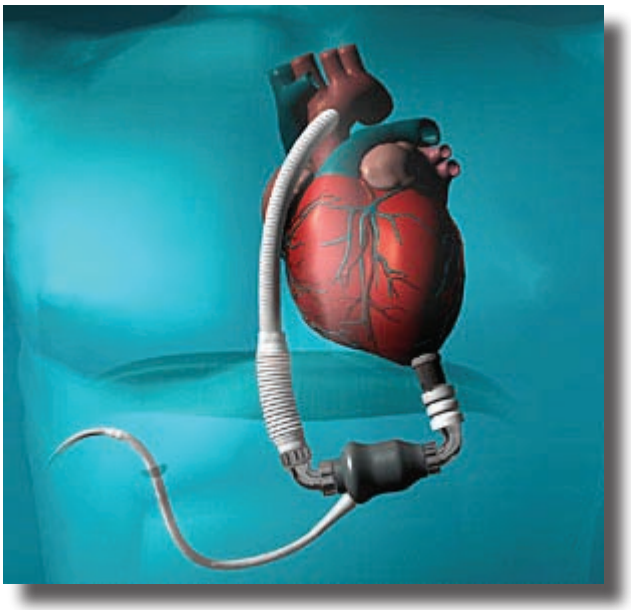
MECHANICAL
CIRCULATORY
SUPPORT
ORGANIZATION

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

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?

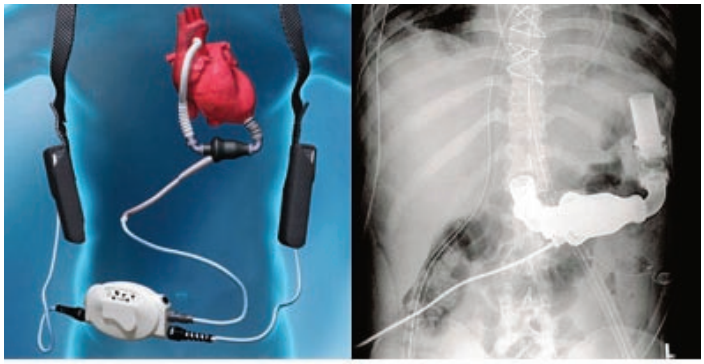
The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver the blood to your body; and a power source.

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

JARVIK 2000

HEARTMATE XVE

THORATEC PVAD/IVAD

FREEDOM DRIVER
Total Artificial Heart

DURAHEART

Patient Management

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

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

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.

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 firs 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 patients equipment.

12. Bring the significan other if possible to act as a expert on the device in the 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 flo 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 fixe 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 defibrillate 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 flo 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 fl .
- 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®

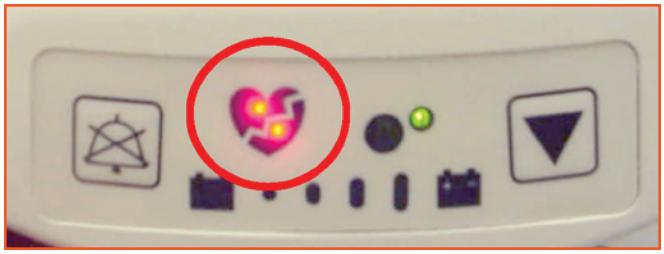
When the Pump Has Stopped

- 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 flo 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.



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 flashin 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 flashin will stop.
- Repeat previous steps with the second battery and battery clip.

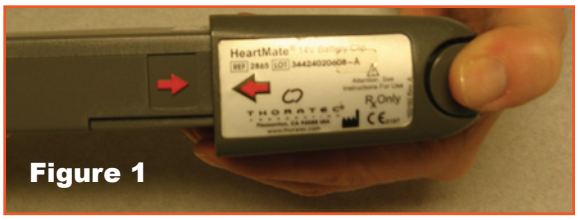


Figure 1


Figure 2

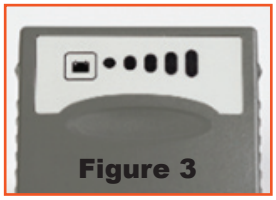


Figure 3

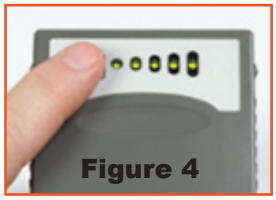


Figure 4

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.

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, confir 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 flo state), what alarms will go off?**

   The device runs at a fixe speed. If a low flo 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 defibrillate while connected to the device?**

   Yes.

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

   No, defibrillat 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 75 to 90 mmHg. Use a Doppler as the firs option to assess blood pressure. If that is not available, use a non-invasive BP (NIBP). 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 firs sound you hear with the Doppler is the MAP.

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

    Yes

FAQs

- May not be able to obtain cuff pressure (continuous flo 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
- 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 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.

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 confirmin 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.

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.

- Confir 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.

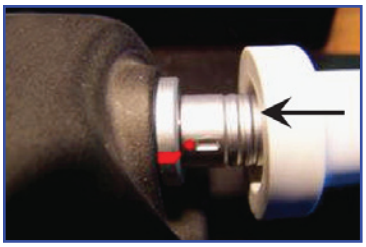
- Disconnect both power sources from the original controller.
- The controller will be turned off and all alarms silenced.

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

HeartWare® Ventricular Assist System Troubleshooting

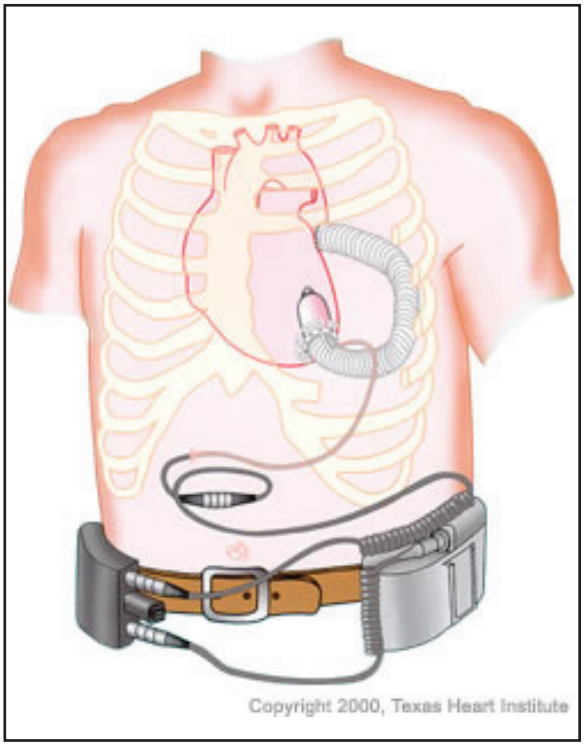
ALARM TYPE	ALARM DISPLAY (Line 1)	ACTION (Line 2)
High - Critical (FLASHING RED)	VAD STOPPED	CONNECT DRIVELINE
	VAD STOPPED	CHANGE CONTROLLER
	CRITICAL BATTERY 1	REPLACE BATTERY 1
	CRITICAL BATTERY 2	REPLACE BATTERY 2
	CONTROLLER FAILED	CHANGE CONTROLLER
MEDIUM (FLASHING YELLOW)	CONTROLLER FAULT	CALL 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 2012

Jarvik 2000 FlowMaker®

1. **Can I do external CPR?**
   Yes.
2. **If not, is there a "hand pump" or external device to use?**
   No.
3. **If the device slows down (low flo state), what alarms will go off?**
   The Underspeed indicator light. If the pump is stopped you will hear a steady alarm and the pump stopped symbol will light up red. This symbol is shaped like a stop sign with a bell in it.. See next page for symbols and locations. Change to a fully charged battery or change from the reserve battery to the L-ion battery.
4. **How can I speed up the rate of the device?**
   Jarvik has an indicator dial usually at a speed set at 3.
5. **Do I need to heparinize the patient if it slows down?**
   No.
6. **Can the patient be defibrillate 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?**
   Yes. Palpable pulse depends on ventricular contractility, preload and afterload.
9. **What are acceptable vital sign parameters?**
   Jarvik suggest MAP 65 - 75mm Hg.
10. **Can this patient be externally paced?**
    Yes.

•• All ACLS medications can be administered.
•• The Li-Ion battery can provide up to 10 hours of power when fully charged.
•• When switching to the reserve battery be sure to follow the color coding of the cables



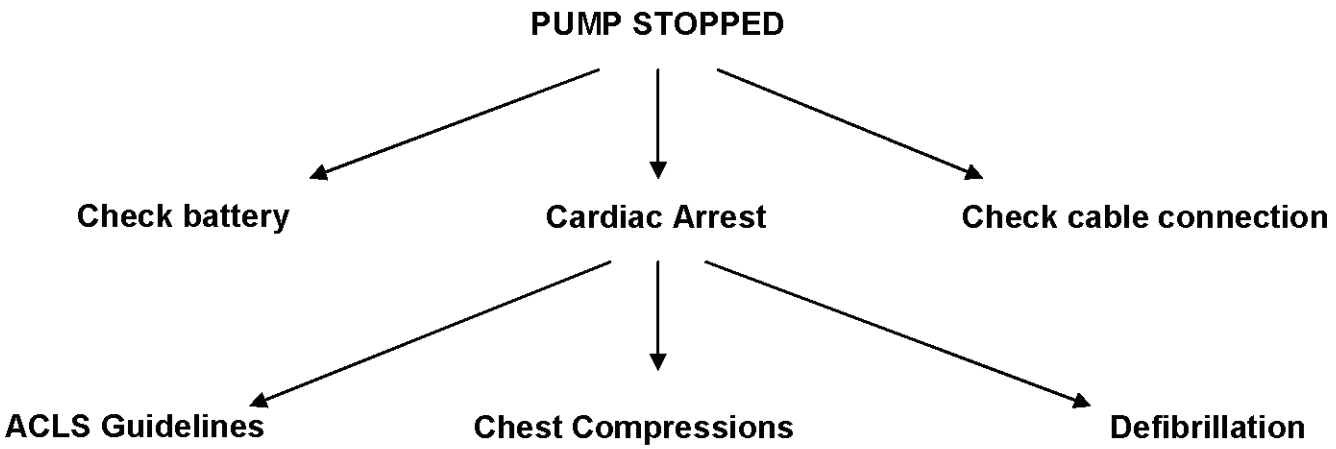
Jarvik 2000 FlowMaker® system

Reserve Battery Pack

Controller attached to the protable Li-ion battery.

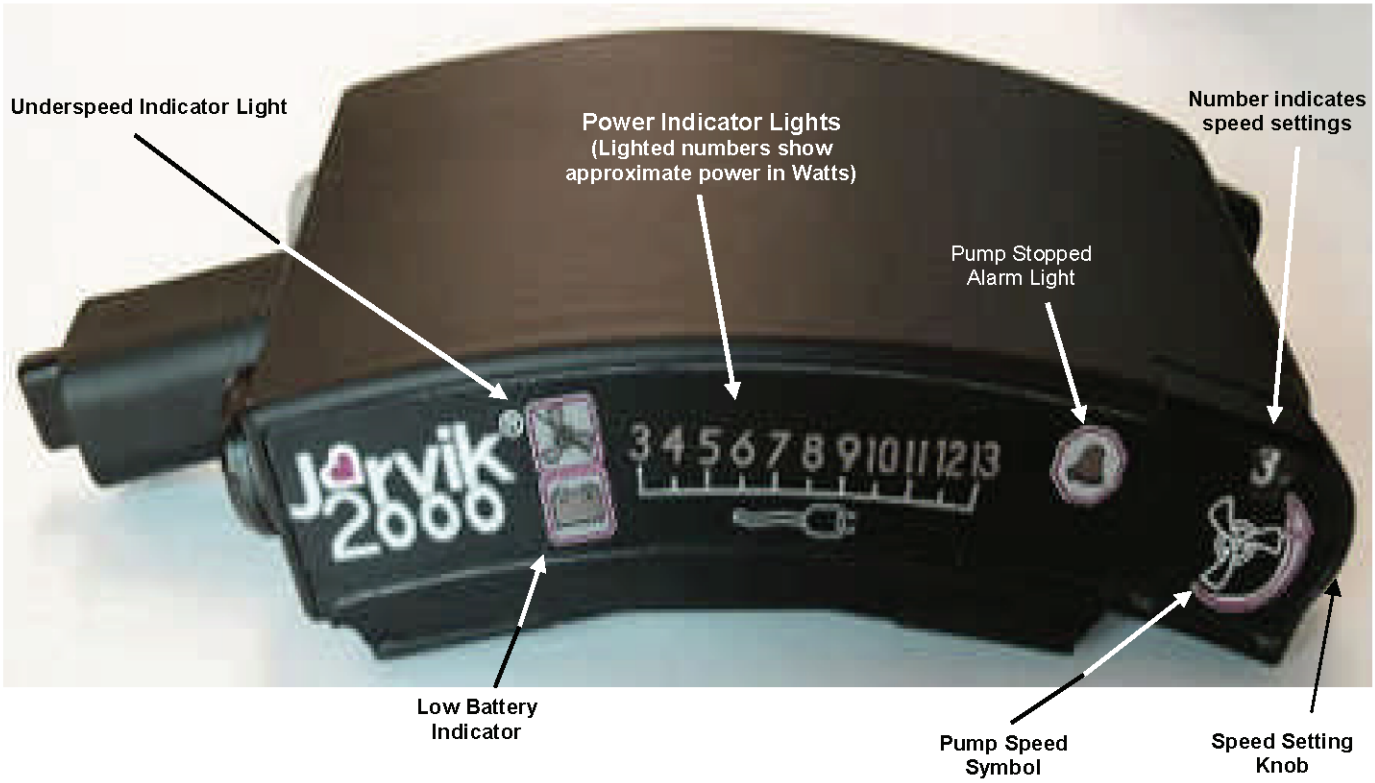
Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press. This guide does not supersede manufacturer instructions. Copy with permission only. March 2009 Jarvik 2000 FlowMaker®

Jarvik 2000 FlowMaker®
Emergency Response Algorithm



If a patient does present with V-tach / V-fib, they are often conscious, but very weak and upon assessment have the classic low output signs.

Jarvik 2000 FlowMaker Controller
Indicators and Troubleshooting



Jarvik 2000 FlowMaker®

The Jarvik 2000 runs ONLY on battery power (no AC adapter or console). Except during battery changes, only one battery is connected to the controller.

The only monitored parameters are pump power (in Watts) and pump speed (setting 1-5). Both are displayed on the controller. Normal ranges by speed are in the table to the left. Power > 1-2W above normal is concerning for pump thrombosis. (*see chart to the left*)

Dial Setting	Speed Rpm	Flow L/min	Power Watts
1	8,000	1-2	3-4
2	9,000	2-4	4-5
3	10,000	3-5	5-6-7
4	11,000	4-6	7-8-9
5	12,000	5-7	8-9-10

Two different battery types are used. The large Reserve battery will power the pump for at least 24 hrs; its charge status cannot be checked. The small Li-Ion battery will power it for 8-12 hrs; its charge status can be checked by pressing the black button on the top (1-5 lights indicate 20-100% charge; *see photo to the left*)

Controller attached to the protable Li-ion battery.

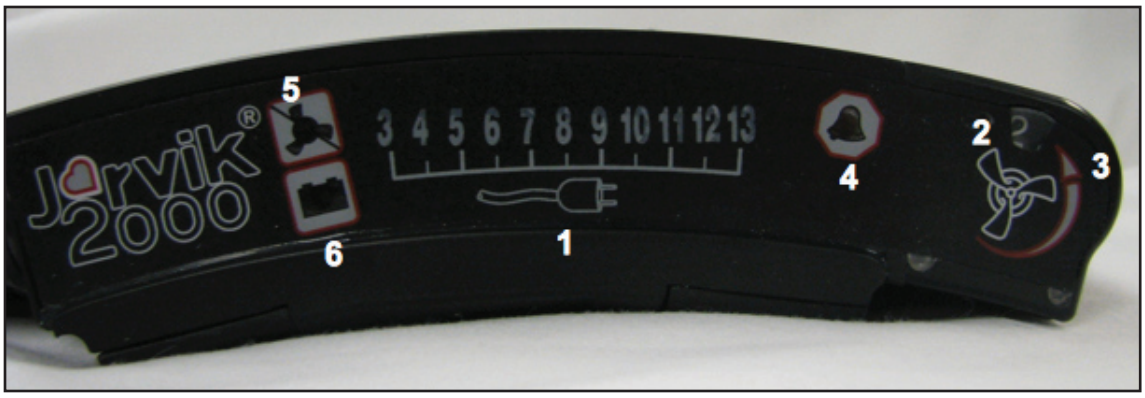
Cables are uniquely color-coded and keyed so that they cannot be mis-connected. Abdominal cable (driveline) connectors are black; power connections are gray or white.

Jarvik 2000 speed is manually adjustable via a dial on the controller. The dial reads from 1 to 5, which corresponds to 8,000 (setting 1) to 12,000 (setting 5) RPM. Most patients are on setting 3 or 4.

The ILS Controller has a white “ILS” sticker on the front. On the ILS controller, the pump speed will decrease to 7,500 RPM for 8 secs every minute. During this period the pulse pressure may widen with a decreased MAP, and the pump power will decrease to 3-4 W.

Jarvik 2000 FlowMaker Controller:

1. Pump power display
2. Speed setting display
3. Speed adjustment dial (on side of controller)
4. Pump-stop alarm indicator
5. Underspeed alert indicator
6. Low battery alarm indicator.



Jarvik 2000 FlowMaker® Controller

Jarvik 2000 FlowMaker® Troubleshooting

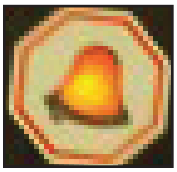
If unsure whether pump is working, listen near apex with stethoscope (should hear high-pitched buzz/hum).

A. Low Battery Alarm *(intermittent beep): 5-10 min on Li-Ion; >=15 min on Reserve.*

To change battery, remove blue/gray cap from unused Y-cable port.

Insert end of new battery cable into open port on Y-cable.

Disconnect old battery & put blue cap on open port.



B. Pump Stopped Alarm *(continuous alarm): Pump not connected or running < 5,000 RPM.*

1. Change to a fresh, fully charged battery;

2. If not resolved, check all cables for proper connection & for damage, including the portion of the abdominal cable that connects to the percutaneous lead at the patient's abdomen. If damaged cable, replace with backup (usually attached to patient's spare contoller);

3. If not resolved, change controller & all cables. Spare controller should have back-up Y-cable & abdominal cable attached to it. If not attached & pt symptomatic, do not worry about finding them

4. Disconnect old abdominal cable (black) from percutaneous lead at patient's abdomen. Set old system, including battery, aside. It will continue to alarm.

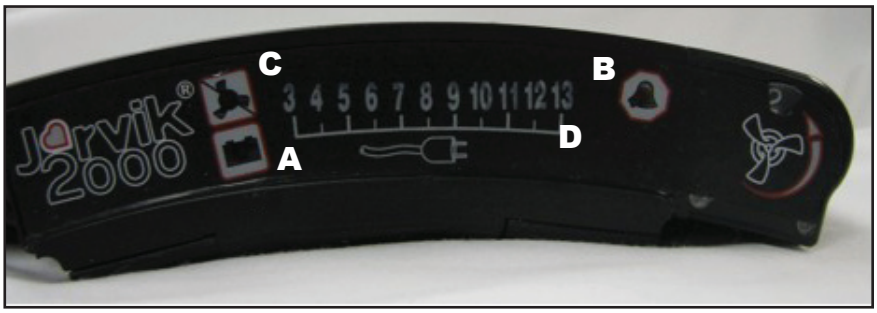
5. Connect new battery to Y-cable (gray to gray; or connect battery directly to gray port on spare controller if unable to locate spare Y-cable). New controller will begin to alarm.

6. Connect new controller's abdominal cable to percutaneous lead at abdomen, or connect percutaneous lead directly to black port on controller if unable to find spare abdo cable. New controlle should cease alarming and pump power should be > 3W.

7. If controller continues to alarm, check all connections again. If unresolved, attempt to manipulate percutaneous lead & connector (may be lead damage). If still unresolved, transport emergently; contact implanting center to see if IV anticoagulation & inotropes are indicated.

C. Underspeed Alarm *(no audible alarm): pump running below set speed.*

If no other alarms are present, not an emergency. Change to a fully charged Li Ion battery. If unresolved, contact implanting center.



D. High Power Alarm

(13W light will be amber w/audible alarm): Power too high for any speed.Auscultate pump to check for operation.

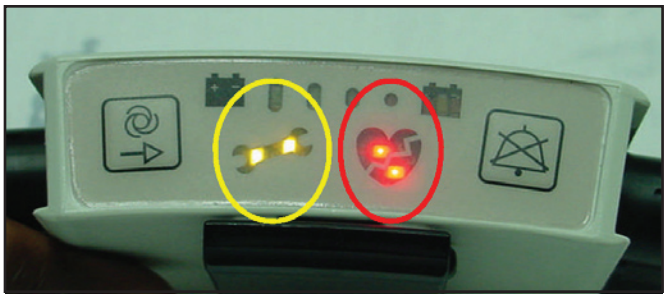
Change all cables & controller as above. If unresolved, transport emergently. Contact implanting center to see if IV anticoagulation/inotropes are indicated. Most likely cause is pump thrombosis.

JANUARY 2012

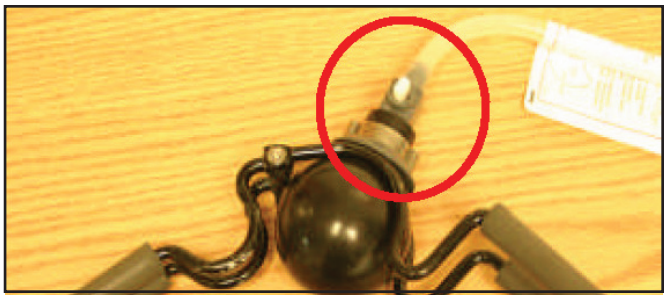
HeartMate® XVE

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 flo 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 defibr llated while connected to the device?**
   No.
7. **If the patient can be defi rillated, is there anything I have to disconnect before defibrillating**
   Yes, disconnect from power/batteries first initiate hand pumping, disconnect controller from driveline, defibrillat 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 flo . 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 2012

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

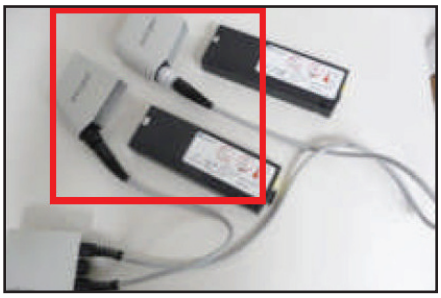


Figure 2B

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 fixe wing aircraft flyin 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.

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.**

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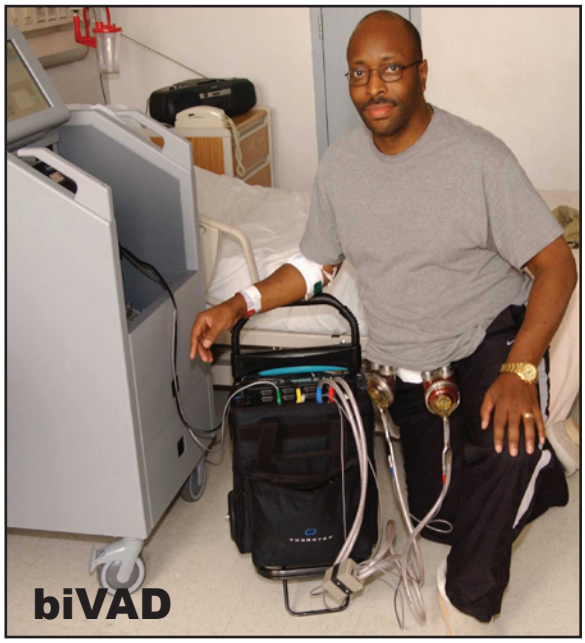
Previous Page

TOC

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, fin the blue or red hand bulbs.
3. **If the device slows down (low flo state), what alarms will go off?**
   Low flo alarms: Loss of fil 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 anticoagulated on Coumadin.
   Only hepariize if the pump stops.
6. **Can the patient be defibrillate while connected to the device?**
   Yes. Nothing needs to be disconnected. Patient should be placed on battery power BEFORE defibrillatio .
7. **If the patient can be defibrillated is there anything I have to disconnect before defibrillating**
   No. If the defibrillatio 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.



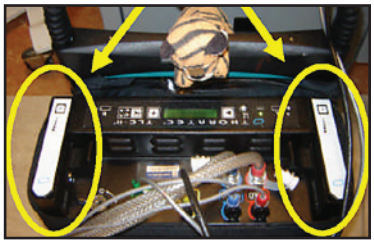
IVAD is implanted inside the abd cavity and is attached to the same TLC II driver on the outside.

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.

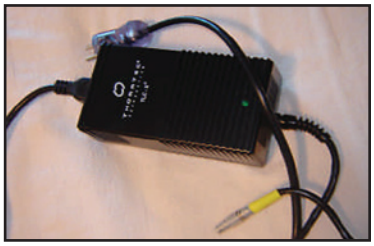
- These patients have biventricular support through 2 pumps: right and left.
- EKG will NOT correlate with the patient's pulse.
- Patient may be in any arrhythmia, but because they have biventricular support — DO NOT TREAT arrhythmias. Only RVAD or LVAD patients should be treated for arrhythmias.
- Bring 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.

PVAD/IVAD

Type of Device: pulsitile

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. Defibrillat if indicated
4. Hand pump only if the devise has stopped pumping, left faster than right.

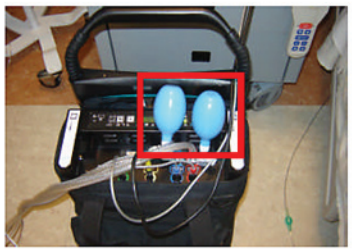
Don'ts

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.

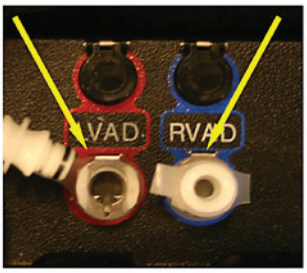
Questions:

1. CPR: NO
2. Hand pump: yes called hand bulbs
3. low flo alarms: Loss of Fill alarm
4. speed up device: fluid
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 configuratio if yes the ECG not important to treat

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.

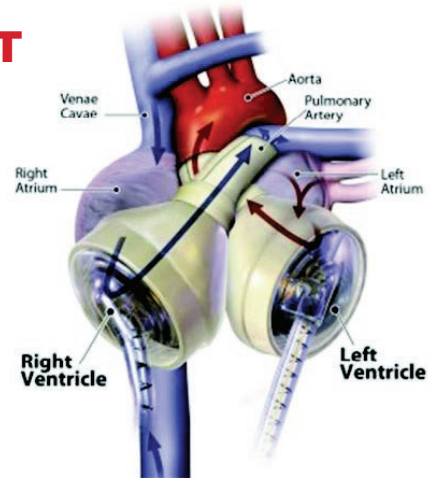
Step 9: Connect to external power, if available by using the AC power adapter cord.

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

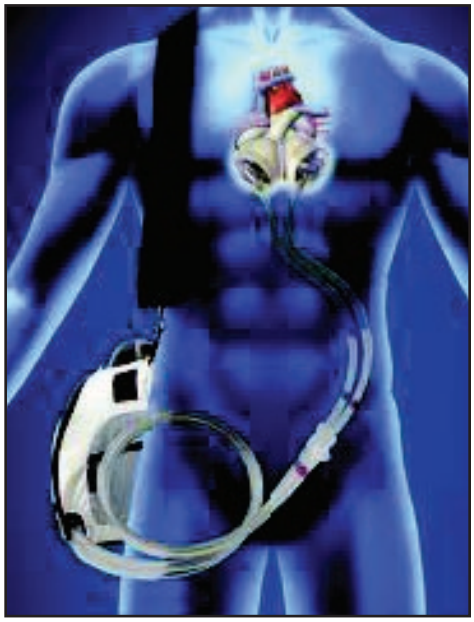
Air Transport Consideration: In rotor wing and fixed wing aircraft flying at heights lower than 10,000 feet-when using the hand pump for external CPR, you must re-purge the bulb every 2000 feet in ascent and 1000 feet in descent. This will assure you have consistent cardiac output.

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 whil 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 flo . 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.



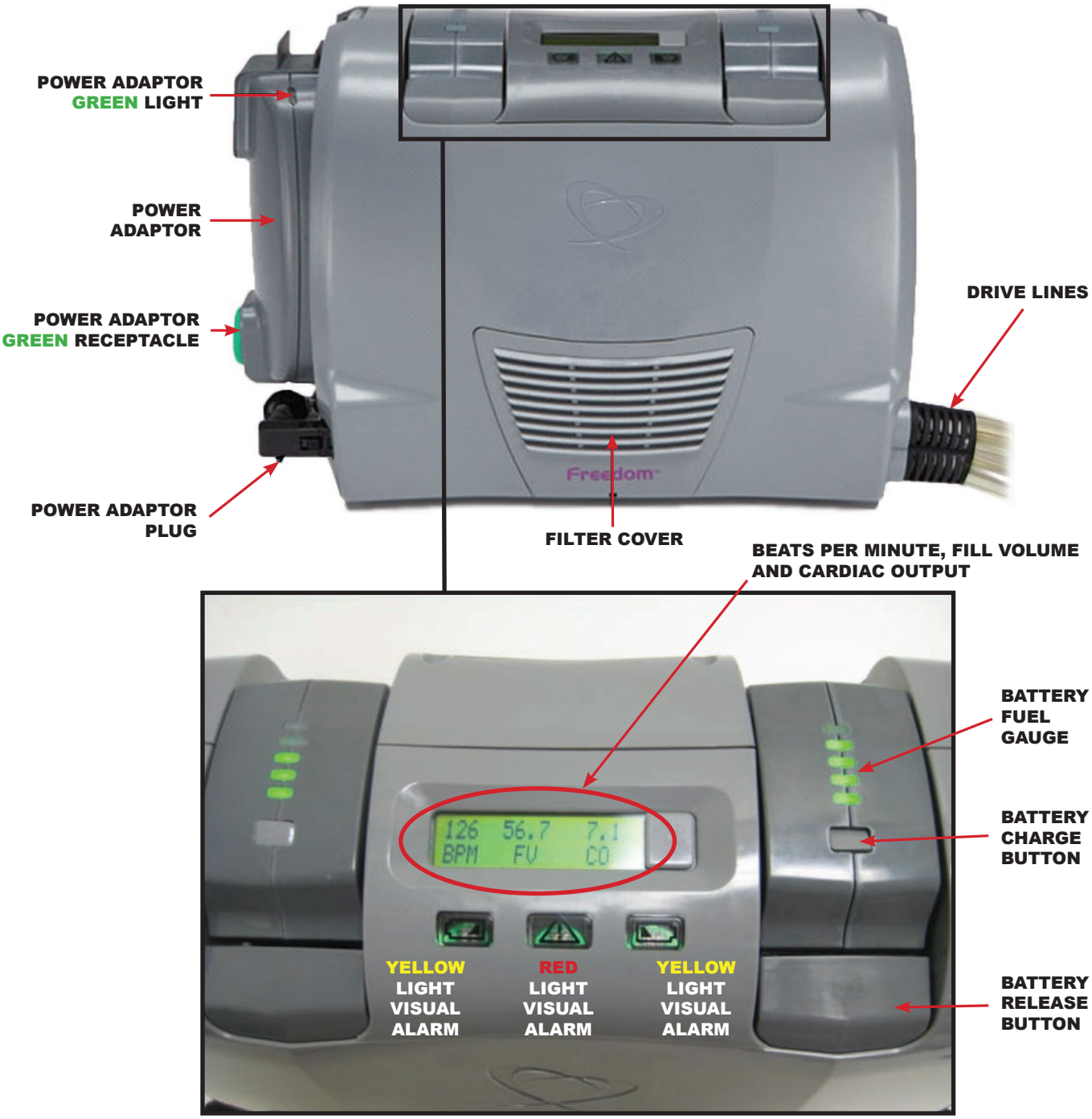
"Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport .ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010"

JANUARY 2013

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 2013

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 2013

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.

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

Switching from Primary to Backup Freedom™ Driver

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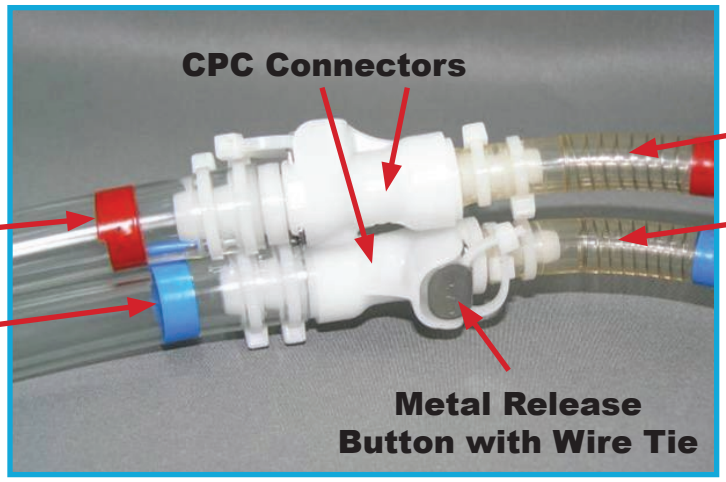
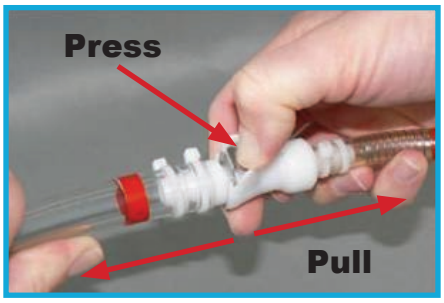
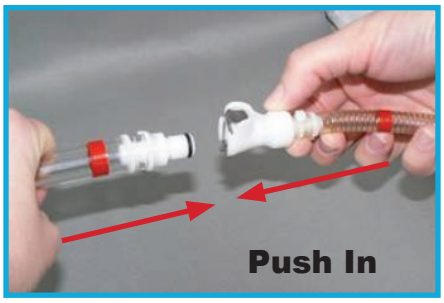






1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the ReD TAH-t Cannula to the ReD Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.
2. With the Wire Cutter Tool, cut the WIre Tie under the metal release button of the CPC Connector that secures the BI Ue TAH-t Cannula to the BI Ue 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 BI Ue Cannula from the BI Ue Drive line of the primary Freedom Driver:
   - Press and hold down the metal release button. Pull the BI Ue Cannula away from the BI Ue Drive line.
   - Immediately insert the BI Ue Cannula into the new BI Ue 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/Outfl conduits
   - External defibrillatio 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 flo 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 modifie in a hospital setting. For low flo 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 defibrillate while connected to the device?**
   Yes.

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

DuraHeart™ System®

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

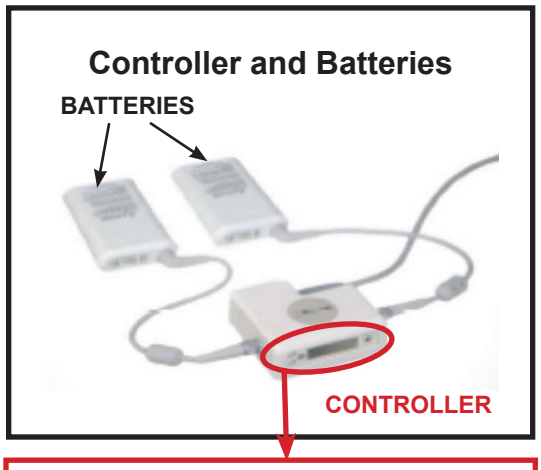
The DuraHeart™ System consists of an implantable Pump and several components that support the function of the Pump. The system is made up of seven main components (see photo below) which include:

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.

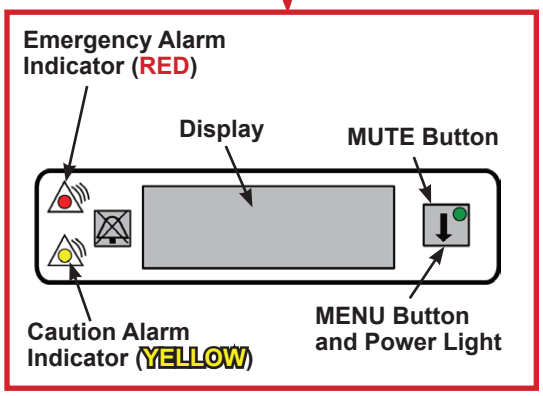
"Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport .ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010

DuraHeart™ System®

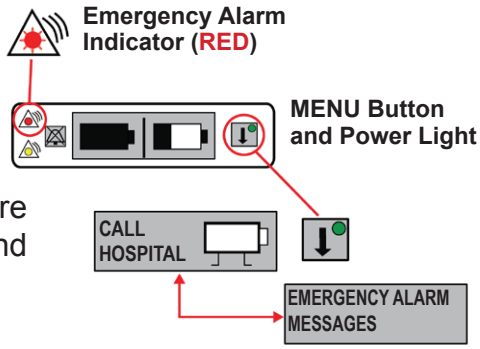
CONTROLLER



- 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

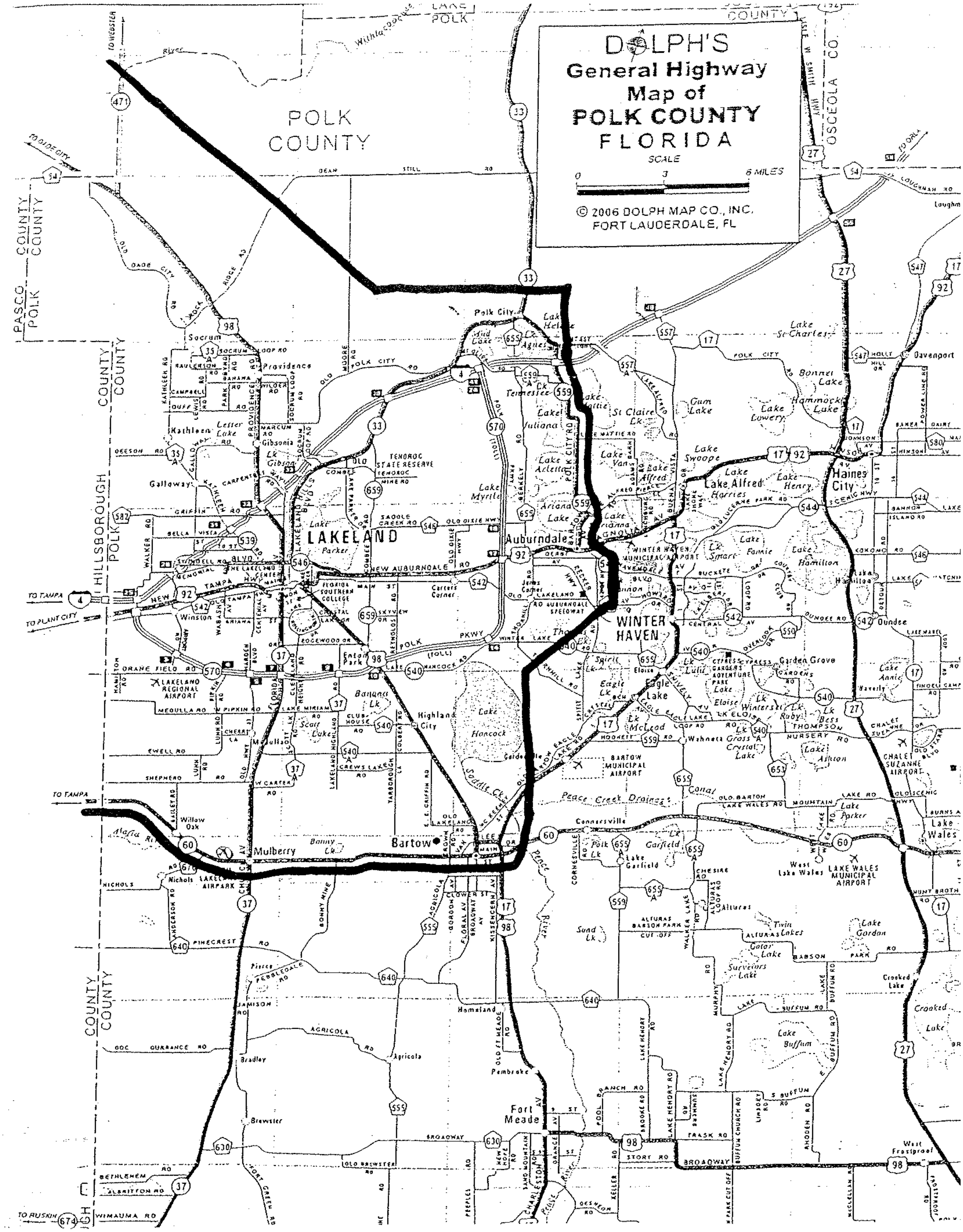
Caution Alerts

- 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

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


DOLPH'S
General Highway
Map of
POLK COUNTY
FLORIDA
SCALE
0
3
6 MILES
© 2006 DOLPH MAP CO., INC.
FORT LAUDERDALE, FL
POLK
COUNTY
PASCO
POLK
HILLSBOROUGH
POLK
OSCEOLA
LAKELAND
WINTER
HAVEN
Auburndale
Bartow
Mulberry
Haines
City
Lake
Wales
Fort
Meade
Polk City
Davenport
Dundee
Eagle
Lake
Highland
City
Homeland
Bradley
Pembroke
Socrum
Kathleen
Galloway
Providence
Gibsonia
Winston
Willow
Oak
Nichols
Brewster
Agricola
Connersville
West
Frostproof
TO TAMPA
TO PLANT CITY
TO RUSKIN
LAKELAND
REGIONAL
AIRPORT
BARTOW
MUNICIPAL
AIRPORT
LAKE WALES
MUNICIPAL
AIRPORT
Peace Creek Drainage Canal

ZOLL® LifeVest®

Questions & Answers

1. What is a LifeVest?
The LifeVest wearable defibrillator is worn by patients at risk for sudden cardiac arrest (SCA), providing protection during their changing condition and while permanent SCA risk has not been established.

2. What does the "Respond" message mean?
Before delivering a treatment shock, the LifeVest tests to see if a patient is conscious by providing the patient an opportunity to press and hold the response buttons to prevent a treatment shock. It is important that only the patient press and hold the response buttons.

3. What if the patient has Blue™ gel on their skin?
The LifeVest therapy pads release a Blue™ gel prior to a treatment shock to both improve shock conduction and mitigate burning. The gel should remain on the patient as long as the patient is wearing the LifeVest in case additional treatment shocks are required. If you choose to remove the LifeVest from the patient and monitor the patient with external equipment, the gel can be removed with water.

4. How long does it take for the LifeVest to treat a ventricular arrhythmia?
After the LifeVest detects a treatable arrhythmia, the time to treatment will be between 25 and 60 seconds depending on the type and rate of the arrhythmia and whether the patient presses the response buttons.

5. Can emergency personnel get shocked by the LifeVest?
Yes. No one should touch the patient while a shock is delivered. The LifeVest will warn bystanders with both a siren alert and a voice command stating "electrical shock possible, do not touch patient," or "bystanders do not interfere" before a shock is delivered.

6. Can emergency personnel use external defibrillation while the patient is wearing a LifeVest?
The monitor should be disconnected from the electrode belt prior to delivering an external defibrillation shock. The garment and belt do not need to be removed.

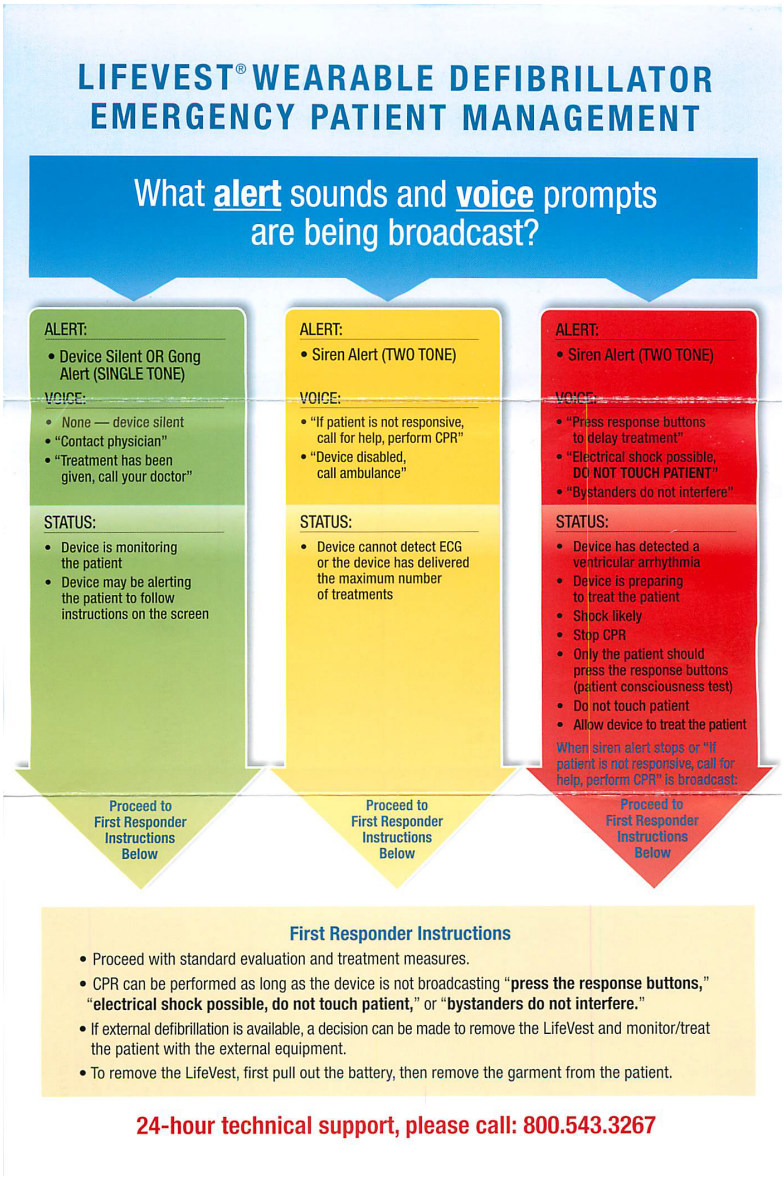
7. What if the patient describes or feels a vibration coming from the garment?
The vibrations, along with the alerts and voice prompts, are part of the LifeVest consciousness test, which requires the patient to press and hold the response buttons to avoid a shock. It is important that only the patient press and hold the response buttons.

8. What LifeVest items should the patient bring with them to the hospital?
If possible, the patient should bring the LifeVest, modem, charger, and extra battery to the hospital. This will allow the patient to download any stored event data from the monitor and charge the battery as required.

24-hour technical support, please call: 800.543.3267

ZOLL • Pittsburgh, PA 15238
p 800.543.3267 • f 866.567.7615 • www.zoll.com

20C0062 Rev E


LIFEVEST® WEARABLE DEFIBRILLATOR
EMERGENCY PATIENT MANAGEMENT
What alert sounds and voice prompts are being broadcast?
ALERT:
• Device Silent OR Gong Alert (SINGLE TONE)
VOICE:
• None — device silent
• "Contact physician"
• "Treatment has been given, call your doctor"
STATUS:
• Device is monitoring the patient
• Device may be alerting the patient to follow instructions on the screen
Proceed to First Responder Instructions Below
ALERT:
• Siren Alert (TWO TONE)
VOICE:
• "If patient is not responsive, call for help, perform CPR"
• "Device disabled, call ambulance"
STATUS:
• Device cannot detect ECG or the device has delivered the maximum number of treatments
Proceed to First Responder Instructions Below
ALERT:
• Siren Alert (TWO TONE)
VOICE:
• "Press response buttons to delay treatment"
• "Electrical shock possible, DO NOT TOUCH PATIENT"
• "Bystanders do not interfere"
STATUS:
• Device has detected a ventricular arrhythmia
• Device is preparing to treat the patient
• Shock likely
• Stop CPR
• Only the patient should press the response buttons (patient consciousness test)
• Do not touch patient
• Allow device to treat the patient
When siren alert stops or "If patient is not responsive, call for help, perform CPR" is broadcast:
Proceed to First Responder Instructions Below
First Responder Instructions
• Proceed with standard evaluation and treatment measures.
• CPR can be performed as long as the device is not broadcasting "press the response buttons," "electrical shock possible, do not touch patient," or "bystanders do not interfere."
• If external defibrillation is available, a decision can be made to remove the LifeVest and monitor/treat the patient with the external equipment.
• To remove the LifeVest, first pull out the battery, then remove the garment from the patient.
24-hour technical support, please call: 800.543.3267

PCFR CATH LAB ACTIVATION PILOT PROGRAM

Currently in use at LRMC only but other hospitals may be included soon.

For a Clear-cut STEMI with all 3 Inclusion criteria below met

1. Ongoing chest pain/ACS Symptoms
2. ST elevation at least 1mm in 2 anatomically contiguous leads
3. No exclusions

Obtain the following Patient Information

Name of primary cardiologist in Lakeland if applicable
Name of primary care physician in Lakeland if applicable

Radio communication to ED to include ALL of the following:

Terminology to be **"STEMI With Cath Lab Activation"**
ECG Interpretation
Patient condition
ETA
Name of Lakeland primary cardiologist
Name of Lakeland primary care physician
If neither of the above: "No Lakeland Cardiologist or Primary Care Physician"

For a clear-cut STEMI with any Exclusion criteria below met

ST elevation without chest pain
Patient refuses cath or consent
Patient has a Valid DNR
Cognitive impairment that precludes informed consent
(For example, the need for head CT or neurological evaluation)
Any bundle branch block or intraventricular conduction defect
Paced rhythm obscuring interpretation of EKG
Hemodynamic instability
Respiratory Instability (Intubated or need for emergent intubation)

Obtain the following Patient Information

Name of primary cardiologist in Lakeland if applicable
Name of primary care physician in Lakeland if applicable

Radio communication to ED to include ALL of the following:

Terminology to be **"STEMI With Exclusions"**
ECG Interpretation
Patient condition
Exclusion(s) met
ETA
Name of Lakeland primary cardiologist
Name of Lakeland primary care physician
If neither of the above: "No Lakeland Cardiologist or Primary Care Physician"

Regardless of activation type all patients will be treated per current clinical care guideline.