AdventHealth

EMERGENCY MEDICAL SERVICES / FLIGHT 1 / CHILDREN

PROTOCOL GUIDELINES FOR MEDICAL CARE

VERSION 1.4D

EFFECTIVE 11/01/2021
REVISED 11/09/2022

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

AdventHealth EMS / Flight 1 / AdventHealth Children Transport
Protocol Guidelines for Medical Care
Authorization for Protocol Guidelines

The AdventHealth EMS / AdventHealth Flight 1 / AdventHealth Children Department Protocol Guidelines for Medical care were developed in accordance with Florida Statute 401 and Florida Administrative Code Chapter 64 J. These protocols are for use by the AdventHealth EMS / AdventHealth Flight 1 / AdventHealth Children and are authorized by the Medical Directors of AdventHealth EMS / AdventHealth Flight 1 and AdventHealth Children.

These guidelines have been developed to assist the health care provider in assessing and delivering appropriate treatment. These guidelines are not intended to replace medical management which has begun prior to AdventHealth EMS / AdventHealth Flight 1 / AdventHealth Children engagement in patient care. The guidelines serve to assist the health care provider in clinical decisions and medical judgment necessary for patient care and safety during transport.

Any deviation of AdventHealth EMS / Flight 1 / AdventHealth Children Protocol Guidelines for Medical care requires a written documentation in the electronic medical record narrative which states justification and clinical criteria.

Dr. James Tanis
Medical Director – AdventHealth EMS / Flight1 **11/01/2021**

Dr. Kimberly Fenton
Medical Director – AdventHealth Children's **11/01/2021**

AdventHealth
Orlando

- The following general measures shall be applied to help promote accurate and timely assessment when rendering interfacility and/or emergency medical care to the sick and injured. These measures provide general parameters for transport of interfacility and pre-hospital patients by Registered Nurses (RN), Registered Respiratory Therapists (RRT), Critical Care Paramedics (CCEMT-P), Paramedics (PMD) and Emergency Medical Technicians (EMT).

    - The safety of AdventHealth EMS Department (ADHEMS) / AdventHealth Flight 1 (ADHF1) personnel is paramount to quality patient care.

    - All crews are expected to use knowledge, foresight, and good judgment always 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. Patients will be transported as safely and quickly as appropriate.

    - All emergent calls shall be patterned after the Emergent Patient Encounter Guidelines and Guidelines for Enhanced Patient Experience***. (159.103)***

    - Should patient condition deteriorate during transport, update Supervisor and/or dispatch as soon as safe and appropriate to do so. Dispatch shall notify receiving unit of status, as well as receiving physician if appropriate. Crew will continue to original destination unless told otherwise by EMS Supervisor or Medical Direction.

    - Body Substance Isolation (BSI) and proper Personal Protective Equipment (PPE) must be utilized according to Exposure Control Plan/Infection Control Policy.

    - Proper consent should be obtained prior to transport and treatment. Respect the patient's right to privacy and dignity.

    - Pediatric patients are defined as 17 years 364 days and younger.

    - The on-scene crew should determine if Critical Care Transport (CCT), Advanced Life Support (ALS) or Basic Life Support care (BLS) will be needed based on patient condition, transport destination, admitting

diagnosis and information gathered at the scene. This will include both adult and pediatric patients.

- Complete the vital signs and initial assessment upon arrival. The patient should be en route to the receiving facility in a safe and timely manner. Continue cardiac monitoring and/or vital signs with a complete reassessment as clinically indicated by admitting diagnosis.

- The paramedic is responsible for all patient care on the ALS ambulance and must direct patient care as needed during transport. The paramedic may designate an EMT to attend BLS patients, but shall remain ultimately responsible for patient care.

- In cases of still alarm or mutual aid response, ADHEMS / ADHF1 crewmembers are directed to utilize ADHEMS / ADHF1 Emergency Medical Services Protocol Guidelines for Medical Care in conducting patient medical management.

- A copy of the electronic medical record for each patient must be completed before the end of each scheduled shift. No copies of patient information will be given to anyone other than the receiving facility.

- Medical management may require additional treatment guidance outside provider protocols. During transport the crew will determine the necessity for consultation with sending physician, accepting physician, or on-line medical control.

- The on-scene crew will acquire all medical records and documentation. Discretion may be used on time sensitive etiologies.

FLIGHT/ CRITICAL CARE

- Always ensure scene safety and wear Personal Protective Equipment at all times.

- No loose items on uniform or hats. Loose items on the patient stretcher should be secured when operating in the vicinity of the aircraft.

- "Hot" loading and unloading of patients is acceptable, provided the crew and patient's safety is maintained always. Helmets and patient hearing protection must be worn during all hot operations. Hot operations for other types of transports may be considered, but on a case-by-case basis. The decision must be made by the pilot and crew.

- Family members may accompany a ADHF1 patient in extenuating circumstances, at the discretion of the pilot and crew. The final decision / ultimate authority shall be determined by the Pilot.

- If defibrillation is needed in the aircraft, advise the pilot prior to defibrillation. Follow ACLS guidelines for defibrillation.

- If an extended transport is anticipated, ensure adequate existing IV infusion medication is available for administration, if not, request additional medication from sending unit to ensure continuity during transport.

- If additional blood will be required during transport, ensure it is ordered by the sending physician, verified and signed by sending RN per hospital policy prior to departure.

- Ventilator management will be determined by patient condition on scene, length of transport, and ventilator management settings. Patient shall be placed on the transport ventilator at settings commensurate with proper settings to safely and appropriately manage oxygenation and ventilation.

- ADHF1 does not transport patients in active labor or imminent delivery. Call dispatch and request to update the accepting physician should this situation arise.

- If a patient has a DNR and the patient / family do not wish to rescind the DNR, the patient will not be transported by air, a CCT or ALS unit shall be dispatched for these patients.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.102**
	TITLE: TRANSPORT GUIDELINES	**Effective Date 11/01/2021**

- ADHEMS / ADHF1 will provide Critical Care Transport, Advanced Life Support, and Basic Life Support transport for the Medical transfer of patients in accordance with the following guidelines:

    - The responsible physician at the transferring facility must order the patient transfer, certifying that the transfer is medically appropriate and that acceptance has been obtained from the receiving physician and facility. An electronic physician certification transfer / transport form must be completed and signed by the attending physician prior to transport. The determination of appropriateness and all actions required under federal and state law are the exclusive responsibility of the transferring physician and facility.

    - The transferring physician and/or his or her designee must request ADHEMS / ADHF1 to provide transport for the patient.

    - The determination of CCT, ALS or BLS will be based on patient condition, transport destination, admitting diagnosis, and information gathered at the scene.

    - The ADHEMS / ADHF1 team will review patient care information prior to arrival without causing delay of patient contact. ADHEMS / ADHF1 will perform an initial assessment and receive report from the sending facility representative. In addition, it is the responsibility of the RN/RRT/Critical Care Paramedic/Paramedic/EMT to confirm the physician's orders for patient management to be continued during transport.

On an ALS unit:

    - The Paramedic/EMT must provide assessment and medical management within their scope of practice. Initial assessment will be made by the Paramedic. The Paramedic and EMT shall collaborate regarding assessment of ALS/BLS status. The EMT on scene reserves the right to refuse responsibility for a patient they believe to be ALS.

    - If the patient will require additional medical/operational management resources, the ADHEMS / ADHF1 crew shall notify Shift Supervisor as soon as possible.

- If the patient is determined to be unstable or it is anticipated that the condition may likely deteriorate en route, the provider should present his/her assessment to the transferring physician. Determination will be made regarding risks/benefits of transport upon consultation with transferring physician and transporting team. The transferring physician and Medical Director will make the final determination of transfer.

- Patients with special needs such as high risk obstetrical patients or patients with IABP may require attendance by specially trained personnel. Shift Supervisor will be responsible to make appropriate arrangements for the transport. ADHEMS / ADHF1 crews will operate within the scope of ADHEMS / ADHF1 protocols. Specialty personnel will operate within their scope of practice and orders from sending/receiving physician. Questions and concerns contact Medical Control immediately.

- Unless medical transport personnel are functioning in a disaster mode, para-transport or MCI only one patient, per vehicle may be transported at any givin time.

- An electronic medical record shall be completed for all patient transports. A signed or electronic Physician Certification Statement shall be on file when required for interfacility transfers.

- For patients who are DNR status, ADHEMS will honor the DNR form throughout entire transport. The Paramedic should have either the original order or a legible copy of the DNR for transport.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.103**
	TITLE: PATIENT ENCOUNTER GUIDELINES	**Effective Date 11/01/2021**

Guidelines for Enhanced Patient Satisfaction

- Entrance and introduction to patient and family by all team members simultaneously.
    - Name, Title.
    - Verify patient's identity with at least two (2) identifiers (name, date of birth and FIN / MRN).
- RN/RRT/CCEMTP/Paramedic/EMT assessment on ED/Hospital stretcher/bed.
- Obtain an initial assessment of the patient.
- Confirm appropriate level of care.
    - Critical Care, ALS or BLS
- RN/RRT/CCEMTP/Paramedic/EMT receives report from patient's current care provider.
    - Documentation
    - Anticipate the need for medical management
- RN/RRT/CCEMTP/Paramedic/EMT may prepare equipment within their scope of practice / level of training.
- Patient transport forms signed and on file.
- Transfer and secure patient to stretcher with all necessary personnel and equipment.
- Reassessment prior to departure.
    - Vital Signs
    - Anticipate potential complications
- Transport.
    - Clarification to patient and family of destination.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.104**
	TITLE: ADDITIONAL HEALTHCARE PROVIDERS IN AMBULANCE DURING TRANSPORT	**Effective Date 11/01/2021**

Healthcare providers shall be defined as but not limited to Physicians, Physician Assistants, Perfusionists, Nurse Practitioner, Registered Nurses, Registered Respiratory Therapists, Paramedics, and EMT's.

- All transports with additional healthcare providers shall be a collaborative effort of medical management with ADHEMS / ADHF1.

- ADHEMS / ADHF1 RN/RRT/CCEMTP/Paramedics and EMT's shall only function within the scope of their practice and authority. ADHEMS / ADHF1 personnel are expected to adhere to the ADHEMS / ADHF1 Protocol Guidelines for Medical Care.

  - AdventHealth physicians who have staff privileges at AdventHealth may provide care within the scope of their practice. The physician is responsible for all care provided and submitting a medical record of medications, procedures, and treatment rendered to the patient.

  - AdventHealth nurses shall function within their scope of practice as defined by the Florida Nurse Practice Act. Nurses providing specialty care shall be trained specifically to the level of care required at time of transport. The nurse is responsible for submitting a medical record of medications, procedures, and treatment rendered to the patient.

  - AdventHealth Registered Respiratory Therapist shall function with the scope of practice as defined by the Florida Department of Health. The respiratory therapist shall be required to provide care in accordance with their level of training and skill level. The RRT is responsible for submitting a medical record of medications, procedures, and treatment rendered to the patient.

  - Roles and responsibilities of ADHEMS / ADHF1 while additional Healthcare providers are in the ambulance during transport:
    - Safety at all times for patient and crew, including any additional healthcare providers.
    - Prior to transport determine who will be providing specific care.
    - All healthcare providers shall collaborate in order to provide medical management in an emergency situation.
    - Position of monitor and seating of healthcare providers to be confirmed prior to beginning of transport.

- Communicate the necessity that all healthcare providers are informed before any intervention, procedure, or treatment methodology.
- Prior to transport all invasive pressure lines, advanced airway adjuncts, intravenous lines delivering medications, and adjuncts to support circulation, will be identified and specific healthcare providers will be assigned to manage during transport.
- An inventory of all medications, including controlled substances used during transport will be conducted by the ADHEMS / ADHF1 crew.
- ADHEMS / ADHF1 shall obtain all necessary documentation.
- ADHEMS / ADHF1 will contact dispatch for any change in patient care requiring rapid response team notification.

- Upon arrival, following introduction of the CCT team to patient and family, initial assessment and hand off communications shall be received from sending facility.
- Initial assessment completed by the CCT team. Discuss case with sending physician if clinically indicated.
- RRT**/**CCEMTP to assess respiratory status and any adjunctive respiratory equipment in use.
- RRT/CCEMTP will be responsible for definitive airway stabilization, management and performance of respiratory/ventilatory interventions.
- RRT/CCEMTP to review chest X-ray, recent ABG and ventilator mode / settings if applicable. If no ABG has been performed, discuss necessity with sending RRT or physician prior to transport.
- RN to review medications infusing and administered prior to arrival of transport team.
- Ensure all necessary documents are ready for transport.
- Document IV lines, ETT, A-line, Foley, NG tube and any additional invasive lines. Document and verify all invasive lines remain intact following transfer to/from stretcher.
- Ensure patient secured to transport stretcher with all safety belts.
- Transfer IV medications to appropriate transport infusion pumps.
- Verify all necessary documents are with the patient, and any belongings which cannot be safely transported are sent with family members.
- Reassess the patient prior to departing unit.
- The CCT team is responsible for documenting in SOAP note with timeline format, in conjunction with assigned clinical patient responsibilities.

- The CCT team shall provide documentation every 10 minutes for hemodynamically stable, and every 5 minutes for hemodynamically unstable patients. The RRT/CCEMTP shall document respiratory status and any respiratory interventions performed during transport.

- The RN/RRT/CCEMTP shall provide care to all patients during transport. This shall include CCT, ALS and BLS acuity patients and both caregivers shall document the medical management provided.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.106**
	TITLE: CESSATION OF RESUSCITATION EFFORTS	**Effective Date 11/01/2021**

All resuscitative attempts should include a conscientious effort to perform a trial of CPR and ACLS. A decision to forgo resuscitative efforts should be based on the following clinical assessment by the ACLS team leader.

- Has CPR been performed for a minimum of 20 minutes?
- Has the team achieved endotracheal intubation or placed an adjunctive airway device to satisfactorily oxygenate and ventilate the patient with an ETCO2 greater than 8mmHg?
- Was the patient defibrillated if VF/Pulseless VT was present?
- Has at least 3 doses of **EPINEPHRINE** been given?
- Were reversible causes ruled out or attempts made to correct reversible causes?
- Asystole documented in a minimum of 2 leads.
- Seek medical direction prior to cessation of resuscitation efforts.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Department Guidelines for Medical Care*	**Protocol Number 159.107**
	TITLE: END OF LIFE ISSUES	**Effective Date 11/01/2021**

Patients who are admitted at an AdventHealth facility, who have an in-hospital DNR form or documentation of valid physician ordered community DNR in their chart, who are being transferred between AdventHealth facilities only, the EMS crew shall be authorized, by the ADHEMS / ADHF1 *Medical Director, to honor the DNR status during interfacility transports as a department of AdventHealth.*

- The Paramedic shall have either the original DNR or a legible copy of the DNR for transport.

- Patients initially found in cardiopulmonary arrest by ADHEMS / ADHF1 personnel, may have resuscitation withheld when:
    - The patient has been decapitated or the thorax has been transected.

    OR

    - The patient has no palpable pulse or blood pressure and exhibits no response to stimuli, exhibits no respiratory effort, is not exposed to an environment likely to promote hypothermia (such as cold water or low ambient air temperatures), and is asystolic in two or more electrocardiographic leads, provided that one of the following is present:
        - Evidence of massive blunt or penetrating head or torso trauma.
        - Rigor mortis
        - Decomposition of body tissues
        - Dependent lividity
        - Incineration

    - Withholding / Cessation of resuscitation must be made in conjunction with the medical control physician.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Interfacility Care***	**Protocol Number 159.108**
	TITLE: Refusal of Medical Care/ Transport	**Effective Date 11/01/2021**

All patients who refuse medical care / transport shall sign the electronic medical record. All patients must verify understanding of refusal of care. Patients who refuse medical care and or transport shall have the following documentation recorded in the electronic medical record.

- Document patient is able to refuse care.
- Document patient is competent to make decision to refuse care.
- Document that patient understands potential consequences of their actions.
- Document the patients understands the necessary medical treatment, and reason for transport.

- Patients who refuse care shall meet the following criteria:
  - 18 years or older
  - Emancipated minor
  - Parent of any child
  - Relative of child if parent unavailable

- Patients who refuse care must demonstrate competency to make refusal of care/transport decision:
  - Alert to person, place, and time / GCS = 15
  - No slurred speech
  - No signs of psychosis or psychiatric condition
  - No auditory hallucinations
  - No visual hallucinations
  - No suicidal ideations
  - No homicidal ideations
  - Gives rational explanation for refusal of care

- Patients who refuse medical care/transport understand the potential consequences of their actions:
  - Death
  - Permanent neurological dysfunction
  - Permanent mental impairment
  - Loss of limb
  - Loss of sexual function
  - Loss of current lifestyle
  - Permanent disability to your unborn child

- Patient understands the medical treatment being offered and reason for transport to another facility:
  - Need for medical treatment and interventions
  - Need for medical test and procedures
  - Need for transfer and admission to another facility
  - Need for further observation and testing

- Initiate report on Med 8 channel at least 5 minutes prior to arrival.
- If unable to make contact with receiving facility, contact dispatch via mobile phone for conference with accepting facility.
- For ADHEMS / ADHF1 mobile phone calls, ask for charge nurse to give report.
- Information to give in report:
    - ALS or CC Truck number (ie; ALS 2-1, CC 1-0)
    - Transport priority (non-emergency vs. emergent)
    - Pt age and sex
    - Chief complaint
    - EKG findings and/or changes, if applicable
    - Any other pertinent information during assessment
    - Treatments initiated and response to treatment
    - ETA- Estimated Time of Arrival

- Additional Information
    - Update the receiving facility with any changes in patient condition.

I. Dispatch Procedures

A. Communications Centers

1. ADHEMS / ADHF1 Department Communications Center for Orange, Seminole, Osceola and Polk counties is located in Orange County in the City of Orlando. All ambulance requests are received by and dispatched by this center. A computer aided dispatch system is utilized to insure prompt response to requests for service. ADHEMS / ADHF1 Communications is located in AdventHealth Orlando in the City of Orlando. All ADHEMS / ADHF1 are received and dispatched by this center.

B. List of information to be obtained from caller

1. Location of patient
2. Type of trauma (Circumstances)
3. Number of trauma victims
4. Extent and severity of trauma injury
5. Scene security / safety
6. Name of caller
7. Callback number

C. 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 Shift Supervisor based on information received from caller(s). The Paramedic upon arrival can request multiple response units.
3. The Shift Supervisor will act as liaison between the Incident Command Center and ADHEMS / ADHF1 until proper personnel arrive.

D. Process used to request assistance from emergency response agency

1. Fire department is recommended to respond to all vehicle accidents, trauma alerts, and unconfirmed trauma alerts.
2. Law enforcement is requested to respond to all vehicle accidents, violent, or potential violent crimes.

3. Air support is requested by the Paramedic or on scene Fire Department Officer where the paramedic is not yet on scene. In addition, the Shift 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.

E. ADHEMS / ADHF1 units and Shift Supervisors will be dispatched via radio.

1. All other requests for an emergency response agency will be made on recorded phone lines.

***AIR SUPPORT IS REQUESTED BY REGION AND AVAILABILITY AS FOLLOWS**

County	Primary
Orange	ORHS AirCare
Seminole	ORHS AirCare
Osceola	ORHS AirCare
Polk	AeroMed

County	Primary
Polk	Bayflight

II. Adult Trauma Triage Criteria

A. Upon arrival at the scene, the crew will initiate Initial Trauma Care and a Primary Survey to assess the patient(s). Those patients with anatomical and physiological characteristics of a person sixteen (16) years of age or older that meet any one of the following four (4) criteria will be classified as a *trauma alert patient* and will be transported according to Section IV of this TTP.

1. Patient presenting with:

R = RED, any one (1) - transport as a trauma alert **B = BLUE**, any two (2) - transport as a trauma alert

AIRWAY	RESPIRATORY RATE of 30 or GREATER B	ACTIVE AIRWAY ASSISTANCE ❶ R
CIRCULATION	SUSTAINED HR OF 120 BEATS PER MINUTE or MORE B	LACK OF RADIAL PULSE WITH SUSTAINED HEART RATE (>120) or BP <90 mmHg R
BEST MOTOR RESPONSE	BMR =5 B	BMR = 4 or LESS or PRESENCE OF PARALYSIS, or SUSPICION OF SPINAL CORD INJURY or LOSS OF SENSATION R
CUTANEOUS	SOFT TISSUE LOSS ❷ or GSW TO THE EXTREMITIES B	2°or 3º BURNS TO 15% or MORE TBSA or AMPUTATION PROXIMAL TO THE WRIST or ANKLE or ANY PENETRATING INJURY TO HEAD, NECK, or TORSO❸ R
LONG BONE FRACTURE ❹	SIGN or SYMPTOMS of a SINGLE FX SITE DUE TO MVA or FALL 10`or MORE B	SIGN or SYMPTOMS of a FRACTURE OF TWO or MORE LONGBONES R
AGE	55 YEARS or OLDER B	
MECHANISM OF INJURY	EJECTION FROM VEHICLE❺ or DEFORMED STEERING WHEEL ❻ B	

❶ Airway assistance beyond administration of oxygen ❷ Degloving injuries, major flap avulsions (greater than 5in.) ❸ Excluding superficial wounds in which the depth can be easily determined ❹ Long bone including humerus, radius/ulna, femur, tibia/fibula ❺ Excludes: motorcycles, mopeds, ATV's, bicycles or the open body of a pick-up truck ❻ Only applies to driver of vehicle

2. The patient presents with a GCS less than or equal to 12

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				

Adult Trauma Triage Criteria (Continued)

3. Patient has suffered:

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

4. Paramedic's Judgment
   If the patient does not meet any of the above listed criteria and the on-scene Paramedic (or Field 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.

III. Pediatric Trauma Triage Criteria

A. Upon arrival at the scene, the crew will initiate Initial Trauma Care and a Primary Survey to assess the patient(s). Those injured individuals with anatomical and physiological characteristics of a person fifteen (15) years of age or younger that meet any one of the following three (3) criteria will be classified as a pediatric *trauma alert patient* and will be transported according to Section IV of this TTP.

B. Pediatric Trauma Triage Checklist: The individual is assessed based on each of the six-(6) physiologic components listed below (left column). The single, most appropriate criterion for each component is selected (along the row to the right). Refer to the color-coding of each criteria and legend below to determine the transport destination

1. **COMPONENT**

SIZE	>20 Kg (44+ lbs.) G	12-20 Kg (22-43 lbs.) G	WEIGHT < 11 Kg or LENGTH < 33 INCHES ON A PEDIATRIC LENGTH AND WEIGHT EMERGENCY TAPE B
AIRWAY	NORMAL G	SUPPLEMENTED O2 G	ASSISTED OR INTUBATED ❶ R
CONSCIOUSNESS	AWAKE G	AMNESIA OR LOSS OF CONSCIOUSNESS B	ALTERED MENTAL STATUS❷ OR COMA or PRESENCE OF PARALYSIS OR SUSPICION OF SPINAL CORD INJURY or LOSS OF SENSATION R
CIRCULATION	GOOD PERIPHERAL PULSES; SBP > 90 mmHg G	CAROTID OR FEMORAL PULSES PALPABLE, BUT THE RADIAL OR PEDAL PULSE NOT PALPABLE or SBP < 90-mmHg B	FAINT OR NON-PALPABLE CAROTID OR FEMORAL PULSE or SBP < 50 mmHg R
FRACTURE	NONE SEEN or SUSPECTED G	SIGN or SYMPTOMS of SINGLE CLOSED LONG BONE ❸ FRACTURE ❹ B	OPEN LONG BONE FRACTURE ❹OR MULTIPLE FRACTURE SITES❺ OR MULTIPLE DISLOCATIONS R
CUTANEOUS	NO VISIBLE INJURY G	CONTUSION OR ABRASION G	MAJOR SOFT TISSUE DISRUPTION ❻or MAJOR FLAP AVULSION or 2° or 3° BURNS TO >10% TBSA or AMPUTATION❼ or ANY PENETRATING INJURY TO HEAD, NECK, or TORSO ❽ R

R = RED, any **one (1)** - transport as a trauma alert B = BLUE, any **two (2)** - transport as a trauma alert G = GREEN, follow local protocols

❶Airway assistance includes manual jaw thrust, single or multiple suctioning, or use of other adjuncts to assist ventilatory efforts ❷Altered mental states include drowsiness, lethargy, inability to follow commands, unresponsiveness to voice, totally unresponsive ❸Long bones include humerus, radius/ulna, femur, tibia/or fibula ❹Long bone fractures do not include isolated wrist or ankle fractures ❺ Long bone fractures do not include isolated wrist or ankle fractures or dislocations ❻Degloving injuries, major flap avulsions, or major soft tissue disruption ❼Proximal to wrist or ankle ❽Excluding superficial wounds in which the depth can be easily determine

2. **Patient has:**

- Crushing or maiming injuries to the hand or foot
- Injuries that may require significant neurovascular surgery
- Injuries that may require extensive cosmetic surgical procedure

3. **Paramedic's Judgment**

If the patient does not meet any of the above listed criteria and the on scene Paramedic or Shift 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.

1. 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 EMT, paramedic, finds any trauma patient that meets the criteria using the appropriate Trauma Scorecard Methodology, shall immediately notify their Communications Center and issue a Trauma Alert using the words *"Trauma Alert".*

D. The paramedic will advise their 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

III. Guidelines for transportation are as follows:

A. ***AIR SUPPORT*** to a **State Approved Trauma Center (SATC)**:

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

B. ***GROUND TRANSPORT*** to a **State Approved Trauma Center (SATC)**:

1. The ground transport time is less than 30 minutes.

C. ***AIR TRANSPORT*** to an **Initial Receiving Hospital (IRH)**

1. The TTP of the Air Transport Agency indicate diversion (e.g. Cardiac arrest etc.).

D. MCI situations.

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

F. With *Physician's Orders from Medical Control* when:

1. Air transport not available or response time is greater than 30 minutes

G. Ground transport to SATC is greater than 30 minutes,

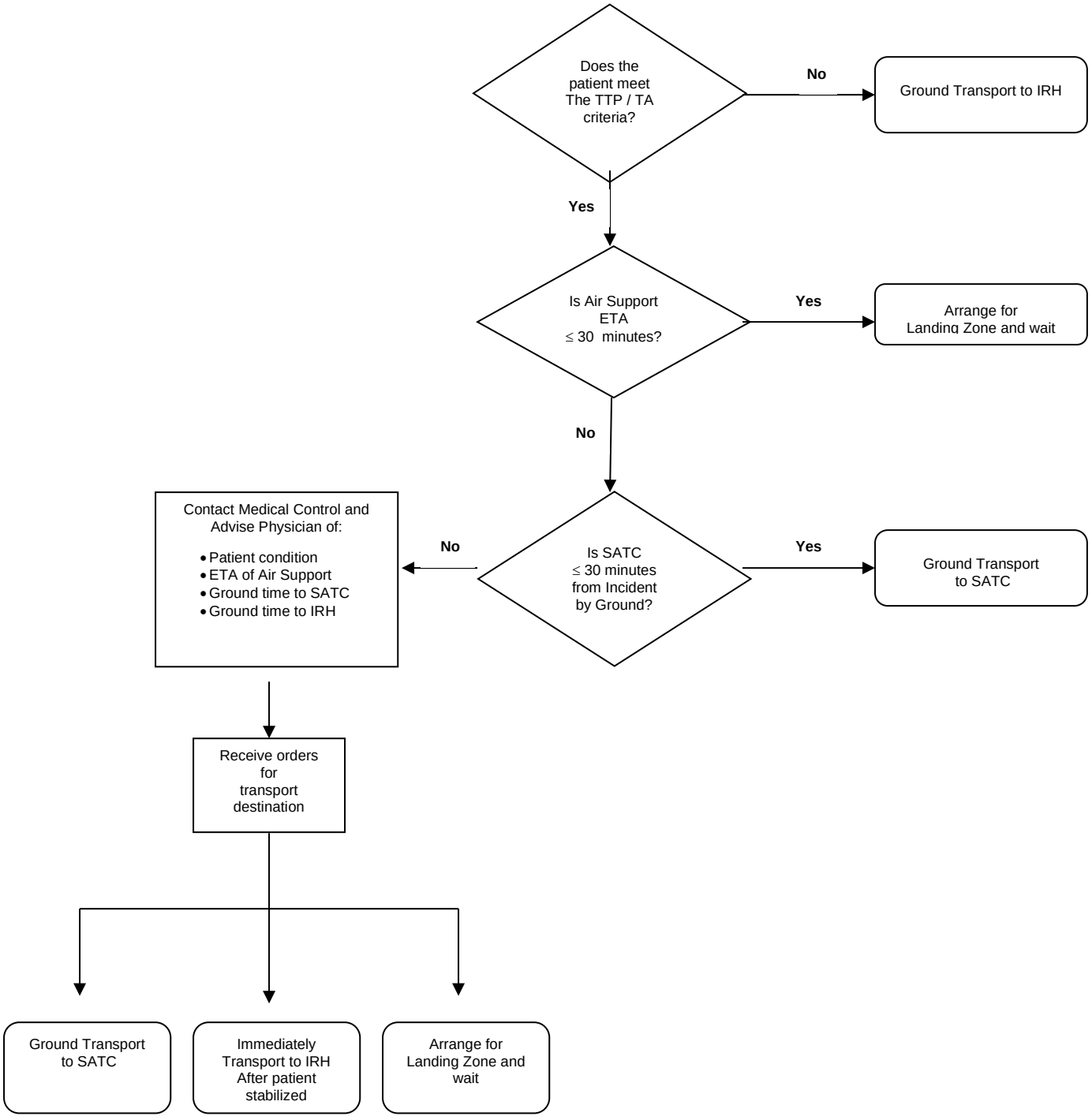
1. Cardiac arrest secondary to trauma.
2. Lack of patent airway.
3. MCI situation. *****

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

In all cases, regardless of the method of transportation or the destination of the Trauma Alert patient, a ADHEMS / ADHF1 run report will be completed for each patient. The report will be delivered to the receiving facility and/or EMS agency.

Transport Decision Flow Chart



IV. 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. 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.

V. List of Hospitals

A. The following is a list of trauma centers and initial receiving hospitals to where ADHEMS / ADHF1 will routinely transport trauma alert patients. Initial receiving hospitals are indicated by written documentation.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.110**
	TITLE: TRAUMA TRANSPORT PROTOCOL (TTP)	**Effective Date 11/01/2021**

TRAUMA CENTERS
INITIAL RECEIVING HOSPITALS

Orlando Regional Medical Center (TL1) 1414 South Kuhl Avenue Orlando, Florida 32806	Central Florida Regional Hospital (TL2) 1401 West Seminole Blvd. Sanford, Florida 32771	Osceola Regional Medical Center (TL2) 700 W. Oak Street Kissimmee, Florida 34741
Arnold Palmer Childrens (TL2) 92 W Miller St Orlando, Florida 32806	Lakeland Regional Medical Center (TL2) 1324 Lakeland Hills Blvd Lakeland, Florida 33805	

ALTERNATIVE FACILITIES

Dr. Phillips Hospital 9400 Turkey Lake Road Orlando, Florida 32819	AdventHealth Kissimmee 2450 N. Orange Blossom Trail Kissimmee, Florida 34741
AdventHealth Altamonte Springs 601 E. Altamonte Drive Altamonte Springs, Florida 32701	AdventHealth Orlando 601 E. Rollins Street Orlando, Florida 32803
AdventHealth Apopka 201 North Park Avenue Apopka, Florida 32703	South Seminole Hospital 555 W State Road 434 Longwood, Florida 32750
AdventHealth Celebration 400 Celebration Place Celebration, Florida 34747	St. Cloud Hospital 2906 17th Street St. Cloud, Florida 34769
AdventHealth East Orlando 7727 Lake Underhill Road Orlando, Florida 32822	AdventHealth Winter Park Hospital 200 N. Lakemont Avenue Winter Park, Florida 32792
Nemours Childrens Hospital 13535 Nemours Pwy Orlando, Fl 32827	Oviedo ER 8300 Red Bug Lake Rd Oviedo Fl, 32765

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.201**
	TITLE: ADVANCED AIRWAY MANAGEMENT	**Effective Date 11/01/2021**

Classification of Transport: ALS

Any patient who clinically demonstrates an inability to protect their airway or clinically demonstrates respiratory failure will require airway management.

BLS CARE:

- 100% oxygen via non-rebreather mask.
- Use head tilt chin lift or jaw thrust maneuver for suspected trauma or cervical injury to manually open airway.
- If airway is not protected AND the patient is hypoxic, despite supplement oxygen or hypo-ventilating AND hypoxic, use bag valve mask to oxygenate and ventilate.
- Place Oral Pharyngeal Airway or Nasal Pharyngeal Airways.
- Ventilate at rate of one breath every 6 seconds.
- If no spontaneous breaths, check pulse and complete BLS primary survey.
- Suction hypopharynx as needed using hard suction catheter.

Adjunctive Airways, Supraglottic Airways (SGA):

- *Place **King LT-D** tube per **King LT-D** placement procedure guidelines.*
  - *Choose appropriate size device.*
  - *Test tube integrity.*
  - *Place head at neutral position.*
  - *Perform correct ventilation rate with cardiac arrest at one breath every 6 seconds.*
  - *Ventilation rate for acute respiratory arrest, one breath every 6 seconds.*

- *Place **LMA** per **LMA** placement procedure.*
  - *Assemble all equipment.*
  - *Choose appropriate size device.*
  - *Test equipment integrity.*
  - *Place head at neutral position.*
  - *Perform correct ventilation rate with cardiac arrest at one breath every 6 seconds.*
  - *Ventilation rate for acute respiratory arrest, one breath every 6 seconds.*

- *If provider is unable to secure an airway with **Supraglottic Airway,** proceed with **Bag-Valve Mask** as per **Bag-Valve Mask** ventilation procedure.*

ALS CARE:

Endotracheal Intubation:

- **Preoxygenate:** with 100% O_2 by Nasal Cannula (NC) at 15 LPM. Leave the Nasal Cannula in place until the airway is secured with an ETT or SGA. Non-rebreather mask or BVM can be used with the NC in place. The rational is to provide a steady flow of oxygen into the airway at all times, even during apneic periods.

- **Procedure:** Perform endotracheal intubation. If unsuccessful, ventilate with BVM use pulse oximetry as a guide. You may re-attempt intubation one time for a total of two attempts. Treat bradycardia during intubation with **ATROPINE** 0.02 mg/kg IV push up to Adult Dose of 1mg IVP, as needed.

- **ETT Intubation confirmation:** Perform confirmation of endotracheal intubation by direct visualization of ETT passing through vocal cords, inflate balloon cuff when endotracheal tube is in place to ensure secure placement. Place EtCO2 detector on ETT and perform 3-5 breaths checking for confirmation. If no ETCO2 available check for placement by positive color change from purple to yellow on color-metric device. Observe chest rise and fall with each ventilation, bilaterally. Perform 5-point auscultation, over the epigastrium, anterior chest left and right, midaxillary line left and right. Auscultation may be impaired secondary to environmental conditions, such as aircraft noise and vibration, and lights and sirens transport. All intubated patients will have SpO_2 and wave form capnography $EtCO_2$ levels monitored.

- **Prevent dislodgement:** Secure endotracheal tube with commercially approved endotracheal tube holder, at the appropriate depth. Alternative methods to secure ETT as warranted by clinical indication. Continuously monitor patient for Dislodgment of ETT, Obstruction, Pneumothorax or Equipment failure (D.O.P.E.).

Adjunctive Airways, Supraglottic Airways (SGA):

- After 2 unsuccessful ETT intubation attempts, the following adjunctive airway devices are available based upon clinical reassessment of the airway.
- Place **King LT-D** tube per **King LT-D** placement procedure guidelines.
- Place **LMA** per **LMA** placement procedure.

- If provider is unable to secure an airway with **ETT**, **King LT-D** or **LMA,** proceed with **Bag-Valve Mask** per **Bag-Valve Mask** ventilation procedure.
- All clinicians that currently hold a Registered Respiratory Therapist license, Registered Nurse license or Paramedic certification may perform ETT Intubation as clinically indicated.
- All clinicians that currently hold a Registered Respiratory Therapist license, Registered Nurse license or Paramedic certification may use Gum Elastic Bougie or Video Laryngoscope as clinically indicated.
- Notify accepting physician of failed airway and need for definitive airway management.
- Notify rapid response team for all patients with a failed airway except those going directly to the Operating Room or an ICU unit bed.
- It's the responsibility of the airway management provider to ensure the security of the airway during the loading and unloading process.
- Reconfirm ETT/supraglottic airway device placement using two methods of confirmation after every transfer/loading of the patient.
- After intubation, all patients should have a naso/orogastric tube inserted. This is to provide gastric decompression and reduce abdominal distension or emesis. Preferred route is orogastric.

Post Intubation:

After the patient's airway is secured and maintained open; the following must be addressed:

- Ventilations needs to be optimized.
- Pain Controlled, as per Protocol ***(159.405)***
- Sedation titrated to maintain the airway and avoid ventilation desynchrony, as per Protocol ***(159.405)***
- Hemodynamics closely monitored for post intubation hypotension and managed appropriately, as per Protocol ***(159.417)***
- Consider paralysis with long term musculoskeletal blocking agent such as **VERCURONIUM**, as per protocol. This step is critical with difficult airway cases to avoid an unplanned extubation. Also, important to consider for aeromedical transportation to avoid an in-flight unplanned extubation.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.202A**
	TITLE: ANALGESIA-SEDATION FOR MECHANICALLY VENTILATED PATIENTS- ADULT	**Effective Date 1/12/2022**

Classification of Transport: CCT/Flight

This protocol is to be initiated on adult mechanically ventilated patients only.

CCT/FLIGHT CARE:

- Assess ET tube or tracheostomy site, verify placement and security. Note presence or absence of dislodgement, obstruction, pneumothorax and equipment failure (DOPE).

- Assess RASS score prior to transport. All patients shall be transported at a RASS score of -4/-5.

CCT/FLIGHT CARE:

- Document ventilator mode and settings.
- Establish/Continue cardiac monitor.
- Continuous SpO2 and Waveform Capnography, $EtCO_2$ monitoring.

    - **FENTANYL** 1 mcg/kg IV Push and may repeat every 3-5 minutes as needed. Transition to FENTANYL Continous Infusion when available and/or feasible, Starting dose 50 mcg/hr titrate Fentanyl 25 mcg/hr every 15 minutes for pain control to a maxium of 300 mcg/hour infusion.

    - **MIDAZOLAM** 0.01 to 0.05 mg/kg IV Push every 3-5 minutes as needed, maximum 10 mg or RASS of -4 to -5. Transistion to MIDAZOLAM Infusion as needed.

    - **MIDAZOLAM** 1 mg/hour, titrate by 0.5 mg/hr every 15 minutes to RASS of -4 to -5. Evaluation of the RASS score should be documented pre and post administration. After initial dose of **MIDAZOLAM** maximum infusion should not exceed 10 mg/hr.

  Patients who are difficult to control with opiates and benzodiazepines or who are tolerant to these medicaltions, addition of a **KETAMINE** bolus and infusion may be necessary to achieve RASS -4/-5.

    - **KETAMINE** 1 mg/kg IV Push every 15 minutes, as needed to augment post intubation sedation. Transition to **KETAMINE** Infusion as needed.

- **KETAMINE** Infusion 0.5 to 1 mg/kg/hr to start, titrate to RASS of -4 to -5.

  KETAMINE Infusion will likely need to be mixed at the bedside. Mix 500mg Ketamine in 250 mL NS, results in a concentration of 2 mg/mL, Label infusion bag, infuse at 0.5 to 1 mg/kg/hr. This is a short term infusion and may need to be repeated. (For example, 100kg patient will get 100mg Ketamine/hour, which is 50 mL/hr, infusion bag should last 5 hours)

Analgesia / Sedation for hemodynamically unstable patients, SBP less than 100, MAP less than 65:

- Use the medications as above with addition of vasopressors.
- Use less benzodiazepines and more Fentanyl and Ketamine for hypotensive patients, titrated as needed.
- Avoidance of Post Intubation Hypotension (PIH) is key, a single episode will impact morbidity and mortality. Patients sould be adequately resuscitated prior to induction/intubation, whenever possible to prevent PIH.
- The patient's Shock Index (SI) is a useful tool to predict PIH. If SI is greater than 0.7, PIH is a likely event.

Shock Index (SI)
SI=HR/SBP

- A good rule of thumb is if the heart rate is greater than systolic blood pressure, SI is too high and PIH and spontaneous cardiac arrest is more likely during and after induction.
- **FENTANYL** is more hemodynamic neutral than **MIDAZOLAM**. If Hypotension is persistent, decrease the use or suspend the benzodiazepines.
- The cause of post intubation Hypotension (PIH) is multifactorial. PIH is likely due to the adverse effects of the induction medications or switching

to positive pressure ventilation. If the patient was in compensated shock prior to intubation, the induction will likely impact their compensatory mechanisms and result in shock.

- Use IV Fluid administration combined with vasopressors to maintain adequate perfusion and blood pressure.
- The dose of **MIDAZOLAM** via continuous infusion needs to be individualized based upon underlying illness and concurrent medications. Consider reduction of the dose of **MIDAZOLAM** with patients who are elderly, chronically ill, and those receiving opioids or other CNS depressants.
- Once adequate sedation is achieved, consider long term paralysis with a long acting musculoskeletal blocker, such as **VECURONIUM**, as needed, in cases of :

    - Difficult airways, to avoid unplanned extubation
    - Difficult to maintain sedation
    - Flight Transport where an unplanned extubation would be difficult to re-intubate.

- **VECURONIUM** 0.1 mg/kg IV Push, up to maximum dose of 10mg. To be given after sedation has been optimized to RASS -4/-5.

Post intubation management can be challengling

Do not hesitate to reach out for assistance

Contact Medical Director as needed

RICHMOND AGITATION SEDATION SCALE (RASS)

Score	Term	Description
+4	Combative	Overtly combative or violent and an immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert but has sustained (> 10 seconds) awakenings, with eye contact, to voice
-2	Light sedation	Briefly (< 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimuli
-5	Unarousable	No response to voice or physical stimulation

AdventHealth Orlando	*AdventHealth EMS AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.203**
	TITLE: CPAP USAGE GUIDELINES	**Effective Date 11/01/2021**

Classification of Transport: ALS

CPAP is a non-invasive positive pressure ventilation (NIPPV) device used to assist the patient's spontaneous respiratory efforts. In order for CPAP to be used, the patient must be alert, able to protect their airway, cooperative and demonstrating spontaneous respirations; or if used to resuscitate a patient, used as a short-term adjunct with close monitoring while a patient has spontaneous respirations.

INDICATIONS:

- Indicated for hypoxemia refractory to supplement oxygen such as in cases of
  - Asthma exacerbation
  - Pulmonary Edema
  - Pneumonia
- Resuscitation with difficult airway concerns
- Used for pre-oxygenation prior to airway management

CONTRAINDICATIONS:

- Apnea
- Persistent nausea and or vomiting.
- Diagnosed pneumothorax without a chest tube.
- Facial Trauma

PROCEDURE:

- Confirm with RRT if in hospital or choose appropriate CPAP / PEEP setting.
- Assemble the equipment.
- Explain the procedure to the patient to help alleviate anxiety.
- Test and confirm the equipment prior to placing on the patient.
- Put the mask to the face of the patient using the least amount of pressure to make a seal.
- Watch the CPAP / PEEP valve to ensure that it remains open during inspiration.
- Monitor the patient's condition for improvement / deterioriation, including the respiratory rate, mental status, and SpO_2.
  - If the patient's condition is improving, continue to monitor the patient.
  - If the patient's condition is deteriorating despite increasing the oxygen adjustment valve, discontinue the CPAP device and prepare for oral tracheal intubation, see advanced airway protocol ***(159.201)***.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.204**
	TITLE: FOREIGN BODY AIRWAY OBSTRUCTION-ADULT	**Effective Date 11/01/2021**

Classification of Transport: ALS

BLS CARE:

- Ask, “Are you choking?”
- Give abdominal thrusts/Heimlich maneuver or chest thrusts for pregnant or obese patients.
- Continue abdominal thrusts/Heimlich maneuver or chest thrusts until effective or patient becomes unresponsive.
- If patient becomes unresponsive, begin CPR.
- Look into mouth when opening the airway during CPR. Use finger sweep only to remove visible foreign body in unresponsive patient.
- Perform CPR until additional resources arrive.
- O_2 per oxygen therapy protocol**. *(159.208)***

ALS CARE:

- Airway management, see advanced airway protocol. ***(159.201)***
- Obtain IV
- Treat arrhythmia per protocol.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.205**
	TITLE: CRITERIA FOR INTUBATION	**Effective Date 11/01/2021**

Classification of Skill: ALS

To provide a patent airway to any patients who are not able to adequately oxygenate and ventilate on their own.

CRITERIA FOR INTUBATION

- Unable to oxygenate. (Hypoxia)
- Unable to ventilate. (Hypercapnia)
- Unable to maintain open airway
- Predicted loss of airway due to clinical course. (Anaphylaxis, angioedema, airway burns, etc.)

See other Protocols for Complete Airway Management

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.206**
	TITLE: LIFE THREATENING ASTHMA / STATUS ASTHMATICUS	**Effective Date 11/01/2021**

Classification of Transport: ALS

Acute life-threatening asthma/status asthmaticus is the result of three pathophysiologic abnormalities; bronchoconstriction, airway inflammation, and mucus impaction. These pathophysiologic abnormalities can rapidly lead to cardiac arrest and death. Early recognition and immediate actions are necessary.

BLS CARE:

- BLS primary survey.
- O_2 per oxygen therapy protocol. ***(159.208)***
- Place patient in high-fowler's position.
- Obtain history of patient's current respiratory medications and time of last dosage.
- Obtain a 12-lead ECG.

ALS CARE:

- If impending respiratory failure, perform endotracheal intubation per advanced airway protocol. ***(159.201)***

First line therapy

- **ALBUTEROL** 2.5 mg via breath activated nebulizer. Repeat as necessary up to 4 doses.
- Give **ATROVENT** (**IPRATROPIUM**)0.5 mg concurrently with every **ALBUTEROL** treatment.
- **METHYLPREDNISOLONE** 125 mg IV for 1 dose.

Second line therapy

- **EPINEPHRINE** (1 mg/mL) 0.3 to 0.5 mg IM every 20 minutes times 3 doses. Use **EPINEPHRINE** with caution in patients who have known coronary artery disease.
- If despite nebulizations patient oxygenation/ventilation deteriorates use **NIPPV**. Clinically a patient must be alert and be demonstrating spontaneous respirations in order for the therapy to be effective.
- **MAGNESIUM SULFATE INFUSION** 2 gm in 100mL NS IV over 20 minutes times 1 dose.

AdventHealth Orlando	***AdventHealth / AdventHealth Flight 1 EMS Department Guidelines for Medical Care***	**Protocol Number 159.207**
	TITLE: Bi-PAP	**Effective Date 11/01/2021**

Classification of Transport: ALS

CPAP/BiPAP are non-invasive positive pressure ventilation (NIPPV) devices used to assist spontaneous tidal volume during inspiration. In order for CPAP/BiPAP to be used, the patient must be alert and able to protect the airway, cooperative and demonstrating spontaneous respirations. If used as a resuscitation adjunct, close monitoring of the patient is required.

INDICATIONS:

- Indicated for hypoxemia refractory to supplement oxygen such as in cases of
  - Asthma exacerbation
  - Pulmonary Edema
  - Pneumonia
- Resuscitation with difficult airway concerns
- Used for pre-oxygenation prior to airway management

CONTRAINDICATIONS:

- Apnea
- Persistent nausea and or vomiting.
- Diagnosed pneumothorax without a chest tube.
- Facial Trauma

ALS/CCT/FLIGHT PROCEDURE:

- Choose proper size mask.
- Explain the procedure to the patient.
- Review ABG values, if available.
- Choose appropriate EPAP
  - Initial setting is 5 cm/H20 with maximum of approximately 10 cm/H20.
  - Titrate EPAP for SpO2 less than 92% if FiO2 is set at 100%.
- Choose appropriate IPAP
  - Initial setting is 5 cm/H20.
  - Titrate to approximate tidal volume of 6 mL/kg of ideal body weight **AND/OR**
  - Improvement of patient's work of breathing.
- Test and confirm the equipment prior to use.
- Place the mask on the patient and adjust the straps using the least amount of pressure to make a seal.
- Monitor the patient's condition for improvement / deterioration, including the respiratory rate, mental status, and SpO_2.

- If the patient's condition is deteriorating, prepare for oral tracheal intubation, see advanced airway protocol ***(159.201).***

Contact Medical Direction, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.208**
	TITLE: OXYGEN THERAPY PROTOCOL	**Effective Date 11/01/2021**

Review all methods of oxygenation and ventilation prior to transport. Use positioning as needed to maintain airway. Monitor patients for signs of impending respiratory failure and criteria for intubation.

BLS CARE:

- ADHEMS / ADHF1 clinicians shall always ensure that the patient has an adequate airway and proper oxygenation.
- Continuous pulse oximetry is required for all patients that may or currently require oxygen therapy.
- Keep patient at oxygen saturation of 92% or greater using the following Standard Oxygen Delivery Devices:

    - Nasal Cannula: Standard initial flow of 2 LPM. Flow rates are between 1-6 LPM. Flow rates can be given upwards of 15 LPM when High Flow Nasal Cannula (HFNC) is indicated, during airway interventions, such as RSI.
    - Venturi Mask: The liter flow and oxygen percentage should be adjusted as instructed prior to transport.
    - Non-Rebreather Mask: The bag should be filled before applying to the patients face. Recommended flow of 10-15 LPM.
    - All Nebulizers and BAN treatments should be administered with oxygen vs compressed air, unless otherwise prescribed.

ALS CARE:

- COPD patients with respiratory rates less than 28 who require oxygen should receive 2 liters via nasal cannula. The oxygen should be increased by 2 liters as necessary to obtain the desired oxygenation. Anticipate assisting respirations with bag valve mask or endotracheal intubation.

- If patient develops impending respiratory failure or criteria for intubation see advanced airway protocol. ***(159.201)***

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.209**
	TITLE: PULMONARY EDEMA/ CHF/ CARDIOGENIC SHOCK	**Effective Date 11/01/2021**

Classification of Transport: ALS

Assess for clinical signs of shock, hypoperfusion, acute pulmonary edema, and attempt to identify underlying cause.

- *Pulmonary Edema/Congestive Heart Failure (CHF) clinical signs and symptoms include, but not limited to tachypnea, hypertension, labored respirations or increased work of breathing (WOB), rales, JVD, peripheral edema, dyspnea, cyanosis, hypoxemia and frothy sputum.*
- *Signs of Cardiogenic Shock (inadequate tissue perfusion) or Decompensated Heart Failure include but are not limited to Hypotension, diminished peripheral pulses, cool extremities, decreased urinary output and lactic acidosis.*
- *CHF is usually the end result of a pathologic condition, such as MI, Cardiomyopathy, Pulmonary HTN, i.e.. a "Pump Problem".*
- *Goals of care are aimed at:*
  - *Reducing Preload/Afterload and Reduction in WOB with CHF.*
  - *Increasing Cardiac Output in Decompensated Heart Failure.*

BLS CARE:

- O_2 per oxygen therapy protocol ***(159.208).***
- Monitor SpO2

ALS CARE:

- Continue ECG monitoring, SpO2 and Waveform Capnography.
- Assess for cardiogenic shock; Systolic Blood Pressure less than 100 mm/Hg or MAP of less than 65 mm/Hg (see Shock protocol ***159.417***).
- Pulmonary Edema/CHF treatment includes the following, based on presenting symptoms:
  - **Fluid Overload (Dyspnea, Increased WOB, JVD, Rales, Edema, Hypertension):**
    - **FUROSEMIDE** 1mg/kg IV to maximum dose of 80 mg.
    - **Push Dose NITROGLYCERIN** (NTG) 400 mcg IV Push every 5 minutes, as needed, hold when SBP drops below 100 mmHg. Push dose-NTG can be given in place of NTG infusion or held when NTG infusion is able to be started.
    - **NITROGLYCERIN INFUSION** 50 mg/250 mL (200 mcg/mL). Begin at 80 mcg/ min and titrate 5 mcg/min every 3 to 5 minutes until patient has relief of work of breathing or Systolic Blood Pressure less than 100 mm/Hg or MAP of less than 65 mm/Hg. *(Note: for prospective, 0.4 mg SL NTG Tablet every 5 minutes is equivalent to 80mcg/min of NTG Infusion. 400mcg/5minutes=80mcg/ min)*
    - **CPAP/BiPAP/NIPPV PEEP** 5 - 10 cm/H_2O if no previous instructions from transferring doctor or respiratory therapist.

- **CHEST PAIN:**
  - Serial 12-Lead ECG, every 15 minutes; High Likelihood of Acute Myocardial Infarction (AMI) (STEMI) when CHF is associated with Chest Pain.
  - **ASPIRIN** 324 mg PO, for chest pain, if not previously given with in last 24 hours and no contraindications.
  - **NITROGLYCERIN** 0.4 mg SL for 3 doses as needed for dyspnea or chest pain. Hold if inferior or right ventricle STEMI or Hypotension.
  - **FENTANYL** 1 mcg/kg for Chest Pain, as per protocol.

- **Decompensated CHF or Cardiogenic Shock:**
  - **See Protocol *(159.418)***
  - **DOBUTAMINE 2 to 20 mcg/kg/min IV Infusion, Titrate to MAP 65**.

  OR
  - **MILRINONE 0.375 to 0.75 mcg/kg/min IV Infusion, Titrate to MAP 65**
    - Add NOREPINEPHRINE if with persistent hypotension.

  - **NOREPINEPHRINE** 0.05 to 1 mcg/kg/min IV Infusion, Titrate to MAP 65.
  - Placement of Arterial Line for invasive BP monitoring is indicated when starting or managing a patient with vasoactive infusions, as per protocol.

Contact Medical Direction, as needed

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.210A**
	TITLE: RAPID SEQUENCE AIRWAY (RSI)	**Effective Date 11/01/2021**

Classification of Transport: ALS/CCT/Flight

BLS Care:

Quality patient care always includes Airway assessment, management and maintenance. 3 parts to airway management include:

1.Open the airway: Head Tilt-Chin Lift or Jaw thrust

2.Maintain the airway open: body positioning, OPA or NPA, suction as needed.

3.Closely monitor airway changes throughout patient contact: Abnormal sounds usually indicted upper airway obstruction such as snoring, gurgling, grunting, stridor, etc. Whereas wheeze, rhonchi, crackles etc. are lower airway pathology. SpO2 decrease is a very late sign of airway compromise, where EtCO2 waveform capnography can be the earliest indicator of ventilation changes that will eventually affect oxygen saturations.

Provide oxygen and ventilatory support as needed and detailed in other protocols.

ALS Care:

"Crash intubations" is a term used for the intubation of an unresponsive, apneic patient, not requiring any sedative or paralytic pharmaceuticals. If a patient is found to be unresponsive, apneic, "Crash Intubation" is indicated. All the guidelines to follow apply to the "Crash intubation", apart from RSI medications.

Once the patient is intubated in a "Crash Intubation" manor, it is common for their LOC to improve rapidly and require sedation after ventilation and re-oxygenation. It is then required to sedate the patient to maintain the airway open as listed below.

Sedative assisted intubation is not an ideal airway management procedure. If a patient is spontaneously breathing and has intact airway reflexes, it is ***not*** recommended to give sedatives only to facilitate intubation. An example of this would be to give only a benzodiazepine and/or fentanyl to intubate a spontaneously breathing patient. This ***should not*** be a standard airway management practice.

Delayed Sequence Intubation (DSI) with a dissociative anesthetic such as **KETAMINE** is a different procedure to resuscitate patients who are in shock, combative, altered with a depressed cardiopulmonary reserve. These patients can be given **KETAMINE** at 1mg/kg Slow IV Push or divided doses, placed on CPAP or BiPAP or High Flow Nasal Cannula for resuscitation. Head of Bed Elevated, Emergency Airway Equipment at the ready bedside and suction available. If a "Crash Intubation" situation arises from the DSI procedure, the patient should be emergently intubated or supraglottic airway inserted as needed.

Our first attempt with intubation MUST be our best attempt.

Resuscitate before RSI Induction to prevent Cardiac Arrest.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.210A**
	TITLE: RAPID SEQUENCE AIRWAY (RSI)	**Effective Date 11/01/2021**

CCT/FLIGHT CARE:

Rapid Sequence Induction (RSI) airway management is used to secure the airway of a patient who is in acute respiratory failure or meets the criteria for intubation per our protocol. *(159.205)*

If after two unsuccessful attempts at intubation proceed to the advanced airway protocol *(159.201)*

Special Care needs to be taken during RSI to prevent malignant hyperthermia. Malignant Hyperthermia is a severe reaction to certain medications used for Rapid Sequence Intubation (RSI).

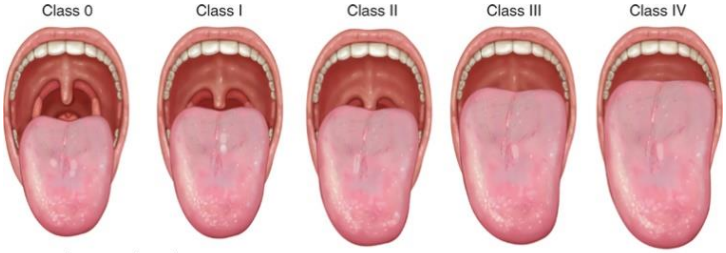
MH symptoms include muscle rigidity/spasm, dyspnea, tachycardia increased body temperature, excessive diaphoresis and mottled skin. In most cases patients show no signs or symptoms of susceptibility to malignant to hyperthermia until exposed to the RSI medications. A family history of malignant hyperthermia excludes the patient from receiving RSI with **SUCCINYLCHOLINE**. Malignant hyperthermia (MH) manifests clinically as a hypermetabolic crisis when an MH-susceptible (MHS) individual is exposed to a volatile anesthetic or **SUCCINYLCHOLINE**.

DSI with **KETAMINE** maybe a better option if MH is suspected or any contraindications to **SUCCINYLCHOLINE**.

Signs of a Difficult Airway:

LEMON Airway assessment method

L	Look externally (Facial trauma, large incisors, beard or moustache, large tongue
E	Evaluate the 3-3-2 rule - Incisor distance: 3 FB - Hyoid-mental distance: 3 FB - Thyroid-to-mouth distance: 2 FB
M	Mallampati Score ≥ 3
O	Obstruction : Presence of any condition like epiglotitis, Peritonsillar abscess, trauma
N	Neck Mobility (Limited neck mobility)



Source: John M. Oropello, Stephen M. Pastores, Vladimir Kvetan: Critical Care
www.accessmedicine.com

If a difficult airway is predicted, then RSI with a paralytic may not be the best course of action and a DSI procedure may be best. Any concern, with time permitting, consult Medical Control to discuss the case and concern.

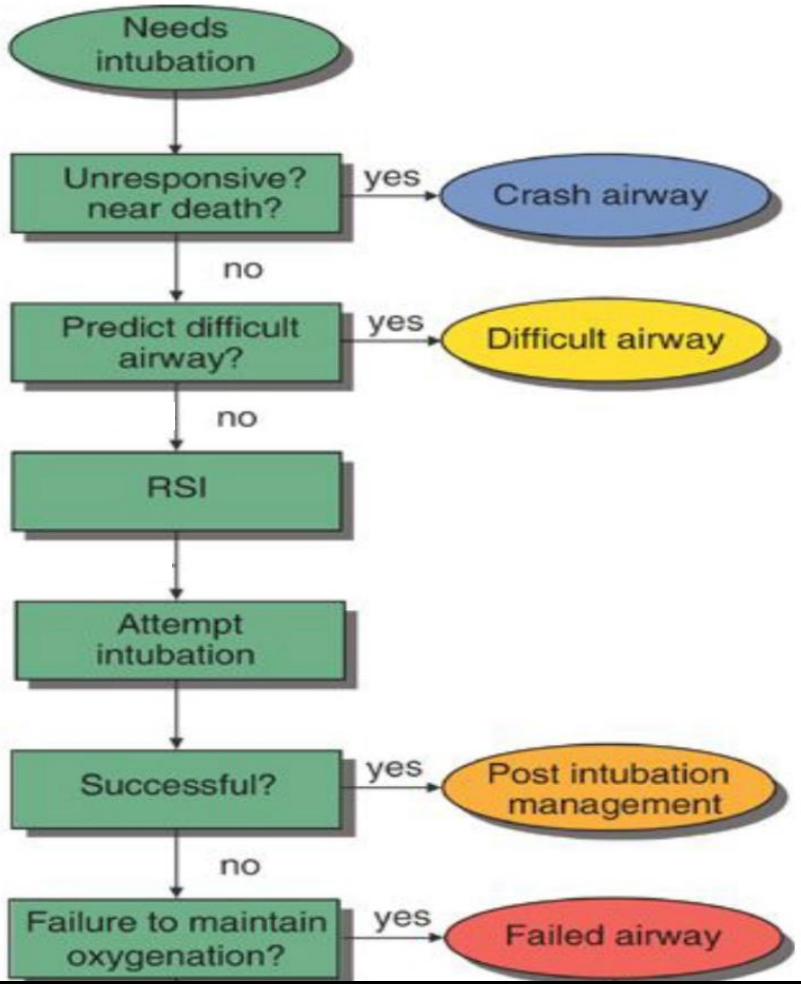
All RSI Procedures require pre-planning and equipment setup prior to induction.

An "Airway Time Out" should take place, led by the team leader, to ensure a unified plan of action

CCT/FLIGHT CARE:

INDICATIONS:

1. Unable to oxygenate. (Hypoxia)
2. Unable to ventilate. (Hypercapnia)
3. Unable to maintain open airway
4. Predicted loss of airway due to clinical course. (Anaphylaxis, angioedema, airway burns, etc.)



CONTRAINDICATIONS: (for SUCCINYLCHOLINE)

- Potential Hyperkalemia
- Chronic Renal Failure/hemodialysis access
- History of Malignant Hyperthermia
- Guillain-Barre syndrome
- Muscular dystrophy
- Myasthenia Gravis
- Difficult Airway is Predicted

PREPARATION:

- Pre-oxygenate with 100% O2 via nasal cannula (leave NC in place until intubation is complete)
- Monitor oxygen saturation, and waveform capnography ETCO2.
- Ensure functioning IV, preferably 2 IV sites
- Difficult Airway Assessment
- Prepare ET Tube and Video Laryngoscope

Have a "Back Up Plan" and equipment readily available for failed intubation

RSI PROCEDURE:

Sedation must be given with paralytic medications.

Sedation/Analgesia:

- **ETOMIDATE**: 0.3 mg/kg (actual body weight) IV Push.

  OR

- **KETAMINE**: 2 mg/kg (ideal body weight) IV slow push.

  AND

- **FENTANYL**: 1 mcg/kg (actual body weight) IV Push.

Paralysis:

- **SUCCINYLCHOLINE**: 2 mg/kg (actual body weight) IV Push.

  OR

- **ROCURONIUM**: 1 mg/kg (ideal body weight) IV Push.

INDUCTION MEDS HAVE SIMILAR ONSET,
THEREFORE, CAN BE GIVEN AT THE SAME TIME.

WAIT 30-60 SECONDS FOR ONSET OF MEDICATIONS
BEFORE INTUBATION ATTEMPT.

- Keep high flow nasal cannula in place during induction, avoid ventilations with BVM during induction to help prevent gastric inflation and vomiting.

- Always have suction available to clear the airway as needed.

- **ETOMIDATE, SUCCINYLCHOLINE, ROCURONIUM OR VECURONIUM** do not offer any pain control, therefore **FENTANYL** should be included in every induction, if not contraindicated, ie allergy.

- Verify tube placement after successful Endotracheal Intubation with waveform capnography.

POST INTUBATION SEDATION:

- **FENTANYL** 1 mcg/kg iv Push and may repeat every 3-5 minutes as needed. Transition to **FENTANYL** Continuous Infusion when available and/or feasible, titrate **FENTANYL** for pain control to a maximum of 250 mcg/hour infusion.

- **MIDAZOLAM** 0.01 to 0.05 mg/kg IV Push every 3-5 minutes as needed maximum 10 mg or RASS of -4 to -5. Transition to **MIDAZOLAM** Infusion as needed.

- **MIDAZOLAM** 0.02 – 0.1 mg/kg/hour, titrate to RASS of -4 to -5.
  Evaluation of the RASS score should be documented pre and post administration. After initial dose of **MIDAZOLAM** maximum infusion should not exceed 10 mg/hr.

For additional Guidance, see Protocol 159.202: Analgesia and Sedation for MV Patients

POST INTUBATION HYPOTENSION:

Post intubation hypotension (PIH) is very common and caused not only by the medication effects but switching to positive pressure ventilation. IV fluid bolus and vasopressors are often needed. See protocols on hypotension and push dose vasopressors.

Monitor airway, ventilation, and hemodynamics with continual cardiac monitor, pulse oximetry, wave form capnography and frequent VS. VS q 5 minutes x 30 minutes post intubation then as per guidelines.

If after two unsuccessful attempts at Endotracheal intubation insert an adjunctive airway device Protocol (159.201).

EMERGENCY REVERSAL OF ROCURONIUM OR VECURONIUM:

- **SUGAMMADEX** 16mg/kg/dose IV x 1 dose.

For the immediate reversal of **ROCURONIUM OR VECURONIUM** (Non-depolarizing musculoskeletal blockade) for any reason to restore spontaneous respirations. Airway and ventilations must be managed until the patient is adequately maintaining a normal minute volume and saturations. Repeat ABG if possible. Continue to closely monitor patient post reversal. Contact Medical Direction as soon as possible, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.211**
	TITLE: REACTIVE AIRWAY DISEASE/ASTHMA/CHRONIC OBSTRUCTIVE PULMONARY DISEASE/EMPHYSEMA	**Effective Date 11/01/2021**

Classification of Transport: ALS

COPD patients with prior history of CO_2 retention may demonstrate a blunted hypoxic drive (mottled skin, irritability, headache, hyper-somnolence), respiratory depression, and/or a change in neurological status when increased levels of supplemental oxygen is administered. Before the administration of supplemental oxygen in CO_2 retaining COPD patients, obtain a history of oxygen usage.

BLS CARE:

- Assess patient per oxygen therapy protocol ***(159.208).*** Beware of blunted hypoxic drive, respiratory depression with oxygen administration in COPD/CO_2 retention patients. Oxygen therapy at 2 liters per nasal cannula for COPD/CO_2 retention patients and increase by 2 liters monitoring for blunted hypoxic drive and/or change in neurological status.
- Place patient in high Fowler's position.

ALS CARE:

- Continue/establish cardiac monitoring.
- Obtain 12-lead ECG with new or increased shortness of breath.
- **ALBUTEROL** 2.5 mg via breath activated nebulizer. Repeat as necessary up to 4 doses.
- Give **ATROVENT** 0.5 mg concurrently with **ALBUTEROL** for all COPD patients. Repeat as necessary up to 4 doses.
- **METHYLPREDNISOLONE** 125 mg IV for single dose.
- If patient is in impending respiratory failure, intubate per advanced airway protocol ***(159.201).***

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol for Medical Care*	**Protocol Number 159.212**
	TITLE: TENSION PNEUMOTHORAX AND NEEDLE DECOMPRESSION/THORACOSTOMY	**Effective Date 11/01/2021**

Classification of Skill: ALS

Treatment of a tension pneumothorax should occur when an assessment has determined a clinical diagnosis of a tension pneumothorax. Clinical signs and symptoms of a tension pneumothorax include but are not limited to severe respiratory distress with cyanosis, decreased breath sounds on the affected side, and hypotension. In addition, distended neck veins, tracheal shift away from the affected side, and loss of consciousness. Intubated patients will be increasingly difficult to ventilate.

Indications:

- Decompression of a tension pneumothorax.

Equipment:

- 14 gauge 4 - inch catheter over the needle.
- Sterile gloves.
- Tape.
- Sterile gauze pads.
- Antiseptic swabs.
- Occlusive dressing.

Procedure:

- Locate decompression site.
  - ***Identify the 2nd intercostal space in the mid-clavicular line*** *on the same side as the tension pneumothorax.*

    OR
  - ***Identify the 5th intercostal space in the mid-axillary line*** *on the same side as the tension pneumothorax.*
- Prepare the site with an antiseptic swab.
- Firmly introduce catheter immediately above the distal rib of the selected site.
- Insert the catheter through the parietal pleura until air exits. Air 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.
- May repeat procedure for recurrence of tension pneumothorax until arrival at accepting unit.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.213**
	TITLE: THORACOSTOMY TUBE/CHEST TUBE	**Effective Date 11/01/2021**

Classification of Transport: ALS

ALS CARE:

- Assess the dressing at thoracostomy site, confirm tube is secured.
- Assess the drainage system, mechanical suction or gravity. Ensure that thoracostomy tube and drainage system are secure before and after every transfer of patient from bed to stretcher
- Assess that the collection system remains below the level of the chest to prevent air/fluid from entering the pleural space.
- Never clamp the chest tube.
- Assess that the thoracostomy tube is connected to a drainage system. All thoracostomy tubes must be attached to a drainage system.
- Maintain suction at indicated level from referring facility.
- If tube becomes dislodged, do not reinsert thoracostomy tube. Secure the thoracostomy site with an occlusive dressing on three sides only.
- If patient condition deteriorates prepare for needle thoracostomy see needle decompression/thoracostomy protocol ***(159.212).***

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol for Medical Care*	**Protocol Number 159.214A**
	TITLE: VENTILATORY MANAGEMENT	**Effective Date 05/01/2022**

Classification of Transport: ALS / CCT/ Flight

The below ranges should be noted for initial ventilatory management; However, ventilatory settings may be adjusted as part of the ventilatory management process.

ALS / CCT / FLIGHT CARE:

- Prepare and assemble all necessary equipment.
- Confirm placement and security of endotracheal tube.
- If available, contact Respiratory Therapist for disconnection of sending ventilator (ALS must contact RT prior to departure from sending facility)
- Transport patient on ventilator in conjunction with bedside assessment and sending Physician's treatment plan.
- Document ET tube placement with each transfer of patient. Include stretcher transfers and entering / exiting vehicle.
- Ensure adequate sedation, analgesia, and if required, paralysis for all patients on mechanical ventilation, see sedation analgesia protocol ***(159.202).***
- If restraints are needed see Behavioral Restraints protocol ***(159.407).***
- Maintain current mode / settings
- Initial Ventilator Management Settings:
  - Volume-Assist/Control
  - Select ventilation rate
    - 12-20 Breaths Per Minute
  - Set tidal volume
  - 6-8 ml/kg (Based on IBW)
- Set FiO_2
  - Starting at 40%-80%
- Set PEEP
  - 5 – 10 cm/H_2O
- Maintain continuous $EtCO_2$ and SpO_2 on all ventilated patients.
- Optimize Ventilator settings to fit the patient situation/clinical condition, Contact Medical Direction, as needed.
- Ensure patient handoff with destination facility Respiratory Therapist / Primary Caregiver.

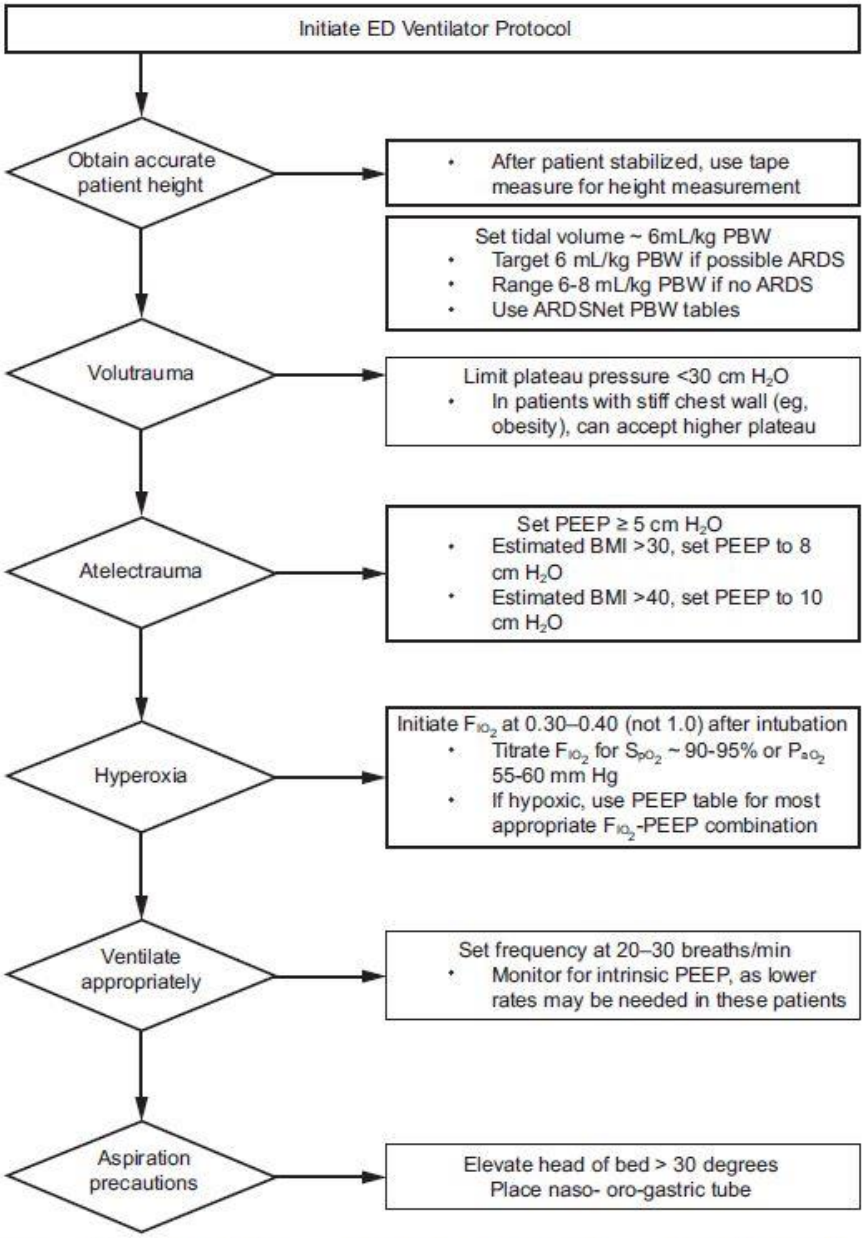


Fig. 1. Emergency department ventilator protocol. ED = emergency department; PBW = predicted body weight. From Reference 36, with permission.

Table 2. Summary table for the 2 ventilator strategies.

	Lung Protective Strategy	Obstructive Strategy
Mode	Volume assist control	Volume assist control
Tidal volume	Start at 8 mL/kg PBW; adjust for plateau pressure goal	8 mL/kg PBW
Inspiratory flow rate	Start at 60 L/min; adjust for comfort	60–80 L/min
Respiratory rate	Start at 16 breaths/min; adjust for $PaCO_2$ goal	Start at 10 breaths/min; adjust to allow full expiration
PEEP	Start at 5 cm H_2O; adjust according to table	0 cm H_2O (some may treat pt with PEEP $\leq$5 cm H_2O)
FiO_2	Start at 40%; adjust according to table	Start at 40%; adjust for SpO_2 $\geq$88%
Check for safety	Measure plateau pressure. If $\geq$30 cm H_2O, decrease tidal volume by 1 mL/kg	Measure plateau pressure or observe flow time graph. If plateau pressure $\geq$30 cm H_2O or flow/time graph shows incomplete expiration, decrease respiratory rate

PBW, Predicted body weight; *pt*, patient.

Table 1. FiO_2 and PEEP scale from ARDSnet ARMA trial.

FiO_2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.0	1.0
PEEP	5	5	8	8	10	10	10	12	14	14	14	16	18	20	22	24

SPECIAL USE PROTOCOL:

Due to the nature of Specialty Care Transport and the limited access to resources outside the hospital, Advanced Airway Providers who have access to a mechanical ventilator and/or are transporting/caring for a mechanically ventilated patient, will have the option to use the ventilator during cardiac arrest to mechanically ventilate a patient while asynchronous chest compressions are administered manually or via mechanical chest compressor. Meaning, when a patient is pulseless and apneic and CPR is indicated, EMS providers have the option to use a LUCAS or Auto Pulse device for chest compressions and the use of the mechanical ventilator as detailed below.

Recommended MV Setting During External Chest Compressions (Either manual or mechanical compressions):

- Controlled Mechanical Ventilation (CMV)
- Set tidal volume=6-8 ml/kg (Based on IBW)
- Select ventilation rate 10-12 Breaths Per Minute
- Set FiO_2=1.0 (100%)
- Set PEEP=5 cm/H_2O
- I:E=1:2 or 1:1
- Turn off the inspiratory trigger
- Adjust as per EtCO2 waveform capnography.

MECHANICAL VENTILATION DURING MECHANICAL CPR

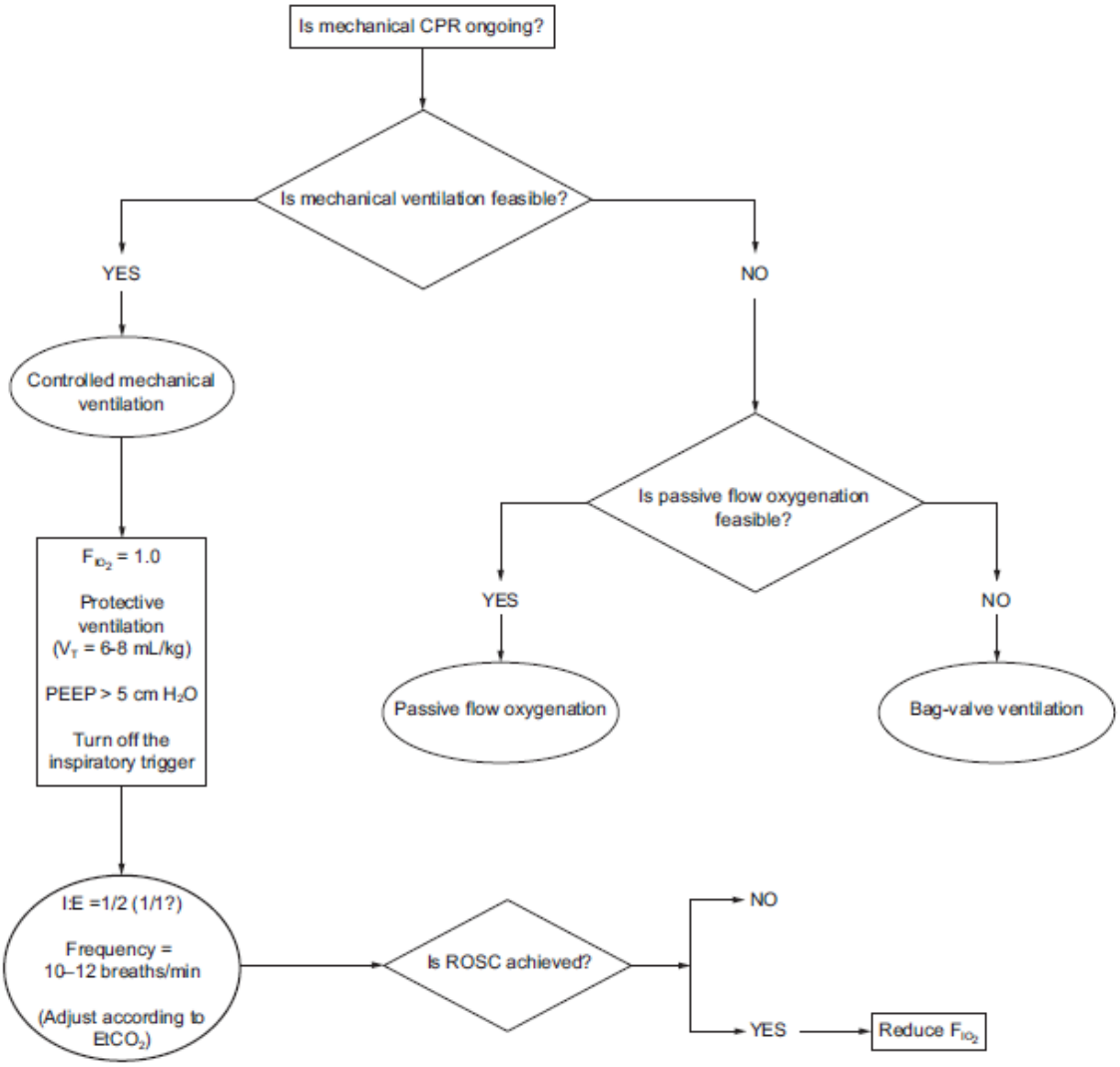


Fig. 2. Proposed operating algorithm for invasive mechanical ventilation during mechanical CPR. CPR = cardiopulmonary resuscitation; V_T = tidal volume; I:E = inspiratory-expiratory ratio; ROSC = return of spontaneous circulation; P_{ETCO_2} = end-tidal carbon dioxide pressure.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol for Medical Care*	**Protocol Number 159.215**
	TITLE: DIFFICULT & FAILED AIRWAY MANAGEMENT	**Effective Date 11/01/2021**

CCT/Flight Care: (Advanced Airway Providers)

Once a Difficult Airway (DA) has been identified or an unsuccessful attempt at airway management arises such as a Failed Airway, all attention must focus on securing a patient's airway, maintaining adequate oxygenation/ventilation and then continuing the resuscitation of the patient.

Two important decisions must be made in the care of the patient:

1. Identification of the Difficult Airway or Failure to secure the airway after interventions, detailed in previous protocols.

2. Provider is Forced to act to secure a patient's airway. Meaning, there exists a situation where airway control is necessary and can not be delayed any longer.

All patients must be assessed for presence of a difficult airway, as in Protocol 159.210.

If a difficult airway is identified, carefully plan the next steps in management. Consider not using paralytics if appropriate (Delayed Sequence Intubation, (DSI)) or if RSI is planned, surgical airway preparations must be setup and available at the bedside; either percutaneous or open cricothyrotomy. Consult Medical Direction, as needed.

Optimize all airway management attempts with a confirmed plan with contingencies.

- Evaluate the airway
- Decide if intubation is required, otherwise continue care and transport of the patient, re-evaluate as needed.
- Detail an Airway plan in a "Airway Timeout" to brief everyone involved at the bedside.
- Verify all the required equipment and supplies are bedside
- Attempt Intubation, as planned.
- Proceed to Post Intubation Management if successful intubation confirmed with waveform capnography.
- Continue to monitor waveform capnography for the duration of patient contact.

Failed Airway is defined as the inability to secure a patient's airway with an endotracheal tube (ETT) or supraglottic airway (SGA).

Attempt oxygenation and ventilation as detailed in previous protocols. If you are unable to intubate and unable to oxygenate/ventilate, proceed to emergent front of the neck airway access. Call for help, activate any and all resources available, ***BUT DO NOT DELAY AIRWAY ACCESS***.

This is the time for either percutaneous or open cricothyrotomy.

Without prompt, front of the neck airway access, death of the patient is imminent.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol for Medical Care*	**Protocol Number 159.215**
	TITLE: DIFFICULT & FAILED AIRWAY MANAGEMENT	**Effective Date 11/01/2021**

It is not appropriate to "wait for" paralytics or sedatives to "wear off".

If you cannot intubate and cannot ventilate/oxygenate (CICV) a patient, a prompt surgical airway MUST be established.

All Advanced airway providers authorized to give RSI Medications must be prepared to perform a surgical airway if a CICV situation occurs during any patient contact time.

Emergent Cricothyrotomy:

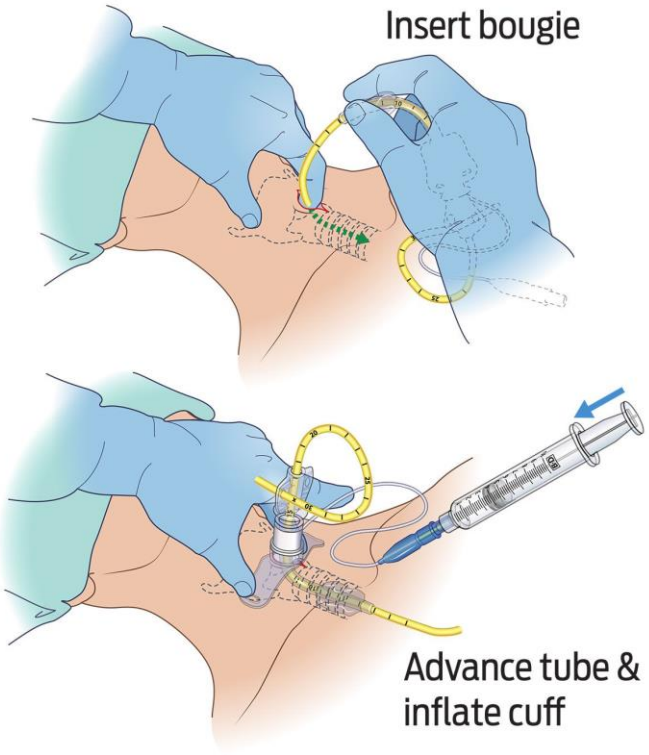
See the manufactures instructions for specific use of a commercial percutaneous cricothyrotomy kits.

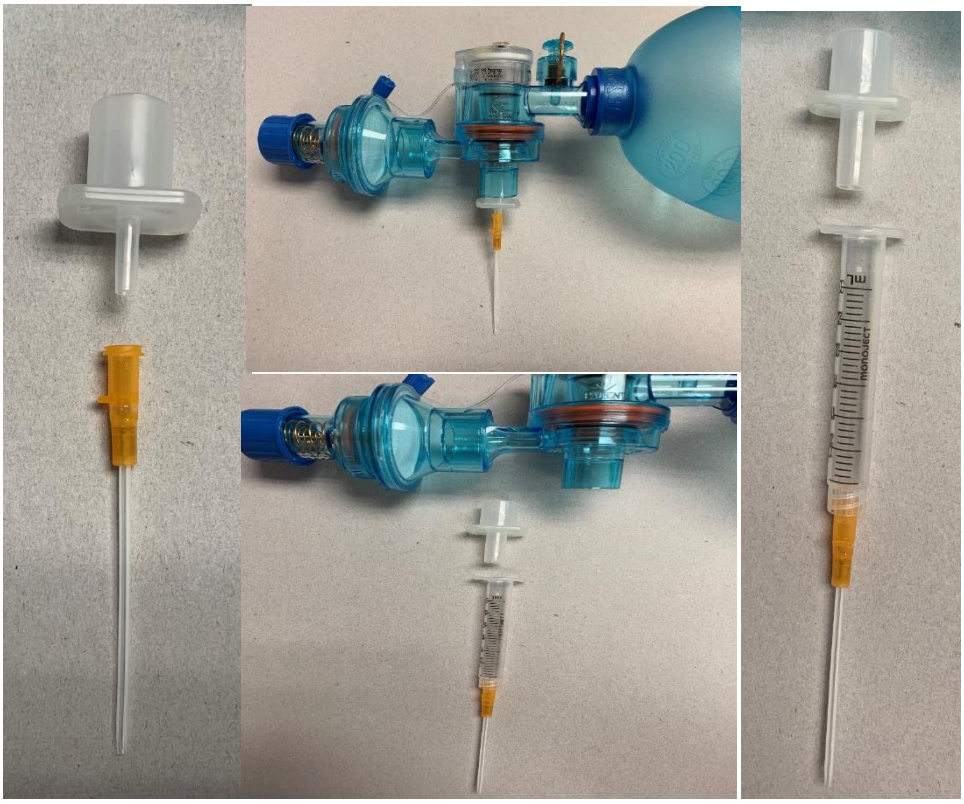
Percutaneous Cricothyrotomy access encompasses identification of the cricothyroid membrane and inserting a needle followed by a guide wire or stylus into the airway to dilate a tract for the cricothyrotomy airway tube. Insertion of the airway and removal of the wire/stylus follows. Verify correct position of the airway with waveform capnography. Secure the airway in place. Ventilate the patient in the usual fashion, as detailed in previous protocols.

Open Cricothyrotomy is the placement of an airway using a surgical approach. Identify the external laryngeal anatomy. Stabilize the larynx with thumb and middle finger, palpate the cricothyroid cartilage and using a scalpel, cut the overlying skin with a vertical incision approx. 3-5 cm. Palpate the cricothyroid membrane through the incision and cut a horizontal incision through the membrane. Expect a spray of blood since you are cutting into an airway, use appropriate PPE. Next insert a bougie into the airway. Introduce a 6.0 ETT over the bougie and into the airway. The depth of the ETT should be that the distal ETT balloon is passed 2-3 cm into the airway. Verify correct position of the airway with waveform capnography. Secure the airway in place. Ventilate the patient in the usual fashion, as detailed in previous protocols.

Needle Jet Ventilation is the placement of a large bore angio-catheter through the cricothyroid membrane to insufflate oxygen into the lungs of a child less then 12 years old in the CICV Emergency situation. The ETT adapter of a 3.0 ETT fits on the BVM and the hub of the large bore catheter used in this case as the airway. Alternatively, the 7.0 ETT Adapter fits into a BVM and the barrel of a 3 mL syringe and then the airway catheter. Secure the airway in place. Ventilate the patient with slow, steady pressure to fill the lungs with oxygen.

This is an emergent, temporizing measure to provide some oxygenation until a definitive airway is placed. A call must be placed dispatch and Medical Control to organize the placement of a definitive airway by another advanced provider.


Insert bougie
Advance tube & inflate cuff



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.216**
	TITLE: HIGH FLOW OXYGEN / HEATED – NON-HEATED	**Effective Date 8/04/2021**

Classification of Transport: CC/FLIGHT

The use of oxygen via Heated High Flow Nasal Cannula (HHFNC) in transport of the adult patient experiencing hypoxemic respiratory failure is an approved and acceptable adjunct.

HHFNC as an adjunct in the ICU environment has been in use for over 20 years. The physiology behind the concept of high flow oxygen (flows 40-60LPM, FiO2 up to 100%) for the adult population is it creates pharyngeal washout of dead-space gas and can provide precise FiO2's with small amounts of positive end-expiratory pressure (PEEP). The benefit of PEEP is ok to be for every 10LPM/flow, you can add +1cmH2O PEEP (4-6cmH2O total). This may provide some airway stenting to assist with improved laminar airflow through the airways while possibly contributing to a small increase in functional residual capacity (FRC).

It should be noted that a significant transport concern, if not the major concern, for HHFNC and NIV patients is the oxygen supply and demand. This is tantamount to a safe and successful patient outcome and transport. Please reference charts.

IF TRANSPORT IS GREATER THAN 90 MINUTES BY GROUND, PATIENT MEETS FLIGHT CRITERIA

FLIGHT/ CRITICAL CARE TEAM:

- Initiate high flow oxygen utilizing current settings at patient pickup.
- Maintain SpO2 Saturation at or above 90%.
- If SpO2 below 90%: Increase FiO2 by 10% to a maximum of 1.0 or 100% to achieve SpO2 of 90% or greater.
- If FiO2 is at 1.0 or 100% and SpO2 less than 88% increase flow rate by 5 lpm every 5 minutes to a maximum of 60 lpm to achieve a SpO2 of 90% or greater.
- If SpO2 is 90% or less after reaching FiO2 of 1.0/100% and flow rate of 60 lpm contact Medical Direction for further instruction.

E Tank

	FIO2% E Tank @2000psi x0.28 = 560L							
	30%	35%	40%	50%	60%	70%	80%	100%
30L/min	2h 48m	1h 52m	1h 15m	0h 50m	0h 37m	0h 30m	0h 24m	0h 19m
35L/min	2h 24m	1h 36m	1h 4m	0h 43m	0h 32m	0h 26m	0h 21m	0h 16m
40L/min	2h 6m	1h 24m	0h 56m	0h 38m	0h 28m	0h 22m	0h 18m	0h 14m
45L/min	1h 52m	1h 15m	0h 50m	0h 34m	0h 25m	0h 20m	0h 16m	0h 12m
50L/min	1h 41m	1h 7m	0h 45m	0h 30m	0h 22m	0h 18m	0h 15m	0h 11m
55L/min	1h 32m	1h 1m	0h 41m	0h 28m	0h 20m	0h 16m	0h 13m	0h 10m
60L/min	1h 24m	0h 56m	0h 37m	0h 25m	0h 19m	0h 15m	0h 12m	0h 9m

M Tank

	FIO2% M Tank @2000psi x1.54 = 3080L							
	30%	35%	40%	50%	60%	70%	80%	100%
30L/min	15h 25m	10h 18m	6h 51m	4h 37m	3h 25m	2h 44m	2h 14m	1h 43m
35L/min	13h 13m	8h 50m	5h 52m	3h 58m	2h 56m	2h 21m	1h 54m	1h 28m
40L/min	11h 34m	7h 44m	5h 8m	3h 28m	2h 34m	2h 3m	1h 40m	1h 17m
45L/min	10h 17m	6h 52m	4h 34m	3h 5m	2h 17m	1h 50m	1h 29m	1h 8m
50L/min	9h 15m	6h 11m	4h 6m	2h 46m	2h 3m	1h 39m	1h 20m	1h 2m
55L/min	8h 25m	5h 37m	3h 44m	2h 31m	1h 52m	1h 30m	1h 13m	0h 56m
60L/min	7h 42m	5h 9m	3h 25m	2h 19m	1h 43m	1h 22m	1h 7m	0h 51m

H Tank

	FIO2% H Tank @2000psi x3.14 = 6280L							
	30%	35%	40%	50%	60%	70%	80%	100%
30L/min	31h 26m	21h 1m	13h 57m	9h 26m	6h 59m	5h 35m	4h 32m	3h 29m
35L/min	26h 56m	18h 1m	11h 58m	8h 5m	5h 59m	4h 47m	3h 53m	2h 59m
40L/min	23h 34m	15h 46m	10h 28m	7h 4m	5h 14m	4h 11m	3h 24m	2h 37m
45L/min	20h 57m	14h 1m	9h 18m	6h 17m	4h 39m	3h 43m	3h 1m	2h 20m
50L/min	18h 52m	12h 37m	8h 22m	5h 39m	4h 11m	3h 21m	2h 43m	2h 6m
55L/min	17h 9m	11h 28m	7h 37m	5h 9m	3h 48m	3h 3m	2h 28m	1h 54m
60L/min	15h 43m	10h 31m	6h 59m	4h 43m	3h 29m	2h 47m	2h 16m	1h 45m

D Tank

	FIO2% D Tank @2000psi x 0.16 = 320L							
	30%	35%	40%	50%	60%	70%	80%	100%
30L/min	1h 36m	1h 4m	0h 43m	0h 29m	0h 21m	0h 17m	0h 14m	0h 11m
35L/min	1h 22m	0h 55m	0h 37m	0h 25m	0h 18m	0h 15m	0h 12m	0h 9m
40L/min	1h 12m	0h 48m	0h 32m	0h 22m	0h 16m	0h 13m	0h 10m	0h 8m
45L/min	1h 4m	0h 43m	0h 28m	0h 19m	0h 14m	0h 11m	0h 9m	0h 7m
50L/min	0h 58m	0h 39m	0h 26m	0h 17m	0h 13m	0h 10m	0h 8m	0h 6m
55L/min	0h 52m	0h 35m	0h 23m	0h 16m	0h 12m	0h 9m	0h 8m	0h 6m
60L/min	0h 48m	0h 32m	0h 21m	0h 14m	0h 11m	0h 9m	0h 7m	0h 5m

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.301**
	TITLE: ASYSTOLE/PEA- ADULT	**Effective Date 11/01/2021**

Classification of Transport: ALS

A rhythm of asystole must be confirmed in more than one limb lead. Eliminate any technical and operational problems prior to a rhythm interpretation of asystole. Consideration of reversible causes is important in the treatment of PEA/Asystole.

BASIC CARE:

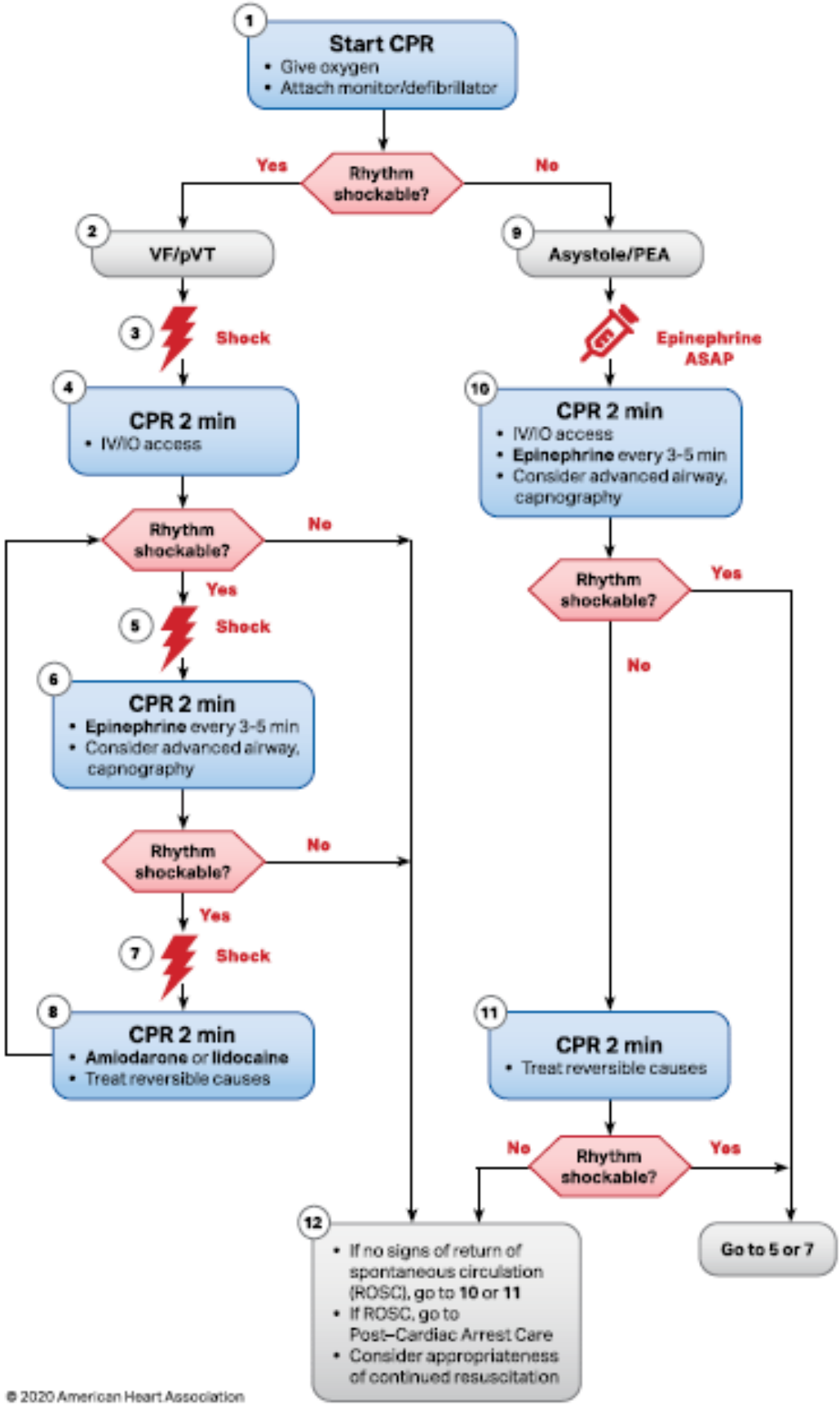
- Immediately initiate help for additional resources.
- Check for pulse no more than 10 seconds.
- Begin CPR per AHA guidelines if no pulse present.
  - Push Hard and Fast (at least 100-120 / min)
  - Ensure full chest recoil
  - Minimize interruptions in chest compressions
- CPR performed at 30 compressions: 2 ventilations.
- Rotate compressors every 2 minutes or sooner if fatigue occurs.
- Turn on AED as soon as available and follow prompts from device (see AED Procedure Protocol. ***(159.302)***

ADVANCED CARE:

- Establish airway, see Advanced Airway Protocol ***(159.201)***
- Obtain IV/IO
- **EPINEPHRINE** 1 mg IV/IO push every 3-5 minutes.
- Evaluate for suspected causes of cardiac arrest:
  - Hypoxia (oxygenation)
  - Hypovolemia (fluids)
  - Hydrogen ion (acidosis)
  - Hyperkalemia/Hypokalemia (potassium)
  - Hypothermia (temperature)
  - Tablets/Toxins (drug overdose)
  - Thrombosis – heart (AMI)
  - Tension Pneumothorax
  - Tamponade (cardiac)
  - Thrombosis – lungs (PE)

- Administer a fluid bolus; 500 mL, reevaluate and repeat as necessary.
- If Tension Pneumothorax is suspected, reassess ETT placement and decompress according to the Pleural Decompression Procedure. ***(159.917)***
- For treatment of asystole secondary to Hyperkalemia
    - **SODIUM BICARBONATE** 1 mEq/kg IV push**.**
    - **CALCIUM CHLORIDE** 1gm IV push
    - Administer only after adequate ventilation.
    - **SODIUM BICARBONATE & CALCIUM CHLORIDE** should not be routinely used in cardiac arrest patients unless they have:
        - Hyperkalemia
        - Diabetic ketoacidosis
        - Tricyclic antidepressant overdose
        - Aspirin overdose
        - Cocaine overdose
        - **DIPHENHYDRAMINE (BENADRYL)** overdose

Adult Cardiac Arrest Algorithm



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100–120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If P_{ETCO_2} is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

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

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3–5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
  or
  Lidocaine IV/IO dose: First dose: 1–1.5 mg/kg. Second dose: 0.5–0.75 mg/kg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in P_{ETCO_2} (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.302**
	TITLE: AUTOMATED EXTERNAL DEFIBRILLATOR	**Effective Date 11/01/2021**

Classification of Skill: BLS

Indications:

- Unresponsive, absence of breathing, absence of pulse or signs of circulation.

Procedure:

- Quickly assess patient for responsiveness, circulation, airway, and breathing. Assess for no more than 10 seconds.
- Initiate CPR if indicated. Push Hard and Fast (at least 100-120 / min)
- Turn on the Automated External Defibrillator (AED). Remove clothing from patient's chest.
- Wipe patient's chest dry and remove any long hair in area where you will place pads.
- Apply AED pads to the patient using the illustrations located on the AED pads. (CPR Landmarks-Refer to the AED Procedure Guidelines)

To Apply Electrodes:

- Tear open the electrodes package and unfold the electrodes.
- Hold the CPR sensor and then place the sensor between the nipples and on the middle of the patient's breastbone, using the sensor's crosshairs to guide you.
- Press the CPR sensor with your right hand and pull the tab to peel the protective backing from the electrode. Press the electrode from the center out to make sure it adheres properly to the patient's skin.
- Press the CPR sensor with your left hand and pull the tab to peel the protective backing from the electrode. Press the electrode from the center out to make sure it adheres properly to the patient's skin.

  NOTE: If the patient is large or there is a need to place the pad under a breast place the pad slightly to the left and below the patient's left breast.

  NOTE: If the patient has an implanted pacemaker or defibrillator in the upper right chest, angle the pad slightly to avoid placing the pad over either device.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.302**
	TITLE: AUTOMATED EXTERNAL DEFIBRILLATOR	**Effective Date 11/01/2021**

CPR/AED Procedure:

- Power on AED
- Attach AED Pads to patient's bare chest
- Clear patient and allow AED to analyze
- If AED advises "Shock" it will tell you to "Clear Patient" and then deliver shock.
- If "No Shock Advised" then immediately resume CPR.
- After 2 minutes the AED will prompt to "Reanalyze"

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.303A**
	TITLE: BRADYCARDIA	**Effective Date 01/12/2022**

Classification of Transport: ALS

Bradycardia will be defined as any patient with a heart rate less than 60 bpm and displays clinical symptoms which may include: significant, crushing chest pain, altered mental status, hypotension with signs of inadequate tissue perfusion, shortness of breath with pulmonary edema, and ventricular escape beats with deteriorating clinical condition.

BLS CARE:

- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

ALS CARE:

- Establish/continue cardiac monitor.
- **ATROPINE** 0.5 mg IV/IO. May repeat every 3-5 minutes to total dose of 3 mg. Consider administration while awaiting **TCP** application. **ATROPINE** administration should not delay implementation of **TCP** for patients with inadequate perfusion.

- **TRANSCUTANEOUS PACING (TCP)** to be used immediately in symptomatic patients with high degree AV block (type II second degree or third-degree AV block).
- **TRANSCUTANEOUS PACING (TCP**): 70 BPM and increase mA from minimum setting until consistent electrical capture is achieved.
- Verify mechanical capture and increase mA by 10% for safety margin.
- Rate may be increased from 70-100 BPM to maintain SBP greater than 100mmhg or MAP greater than 65mmhg.
- If patient experiences discomfort with pacing, refer to protocol # 159.405

- **EPINEPHRINE INFUSION:** 0.02 mcg/kg/min IV infusion (**EPINEPHRINE 1:1,000** 1mg in Normal Saline or D5W 250ml). Max. Dose 2 mcg/kg/min. Titrate by 0.02 mcg/kg/min every 10 minutes.

- Consider reversible causes:
  - Hypoxia (oxygenation)
  - Hypovolemia (fluids)
  - Hydrogen ion (acidosis)
  - Hyperkalemia/Hypokalemia (potassium)
  - Hypothermia (temperature)
  - Tablets/Toxins (drug overdose)

- Thrombosis – heart (AMI)
- Tension Pneumothorax
- Tamponade (cardiac)
- Thrombosis – lungs (PE)

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.304**
	TITLE: CHEST PAIN MANAGEMENT	**Effective Date 11/01/2021**

Classification of Transport: ALS

Perform assessment and determine if chest discomfort is suggestive of ischemia. Ischemia may present as but is not limited to: discomfort in jaw, pain between shoulder blades, dyspnea, nausea/vomiting, epigastric discomfort, or diaphoresis.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- **ASPIRIN** 162 mg PO if not previously given with in last 24 hours and no contraindications. Check for Aspirin allergy prior to administration.

ALS CARE:

- IV access with saline lock.
- Establish/Continue cardiac monitor.
- View 12 lead EKG to determine EKG changes. If inferior MI then get right sided EKG.
- Obtain 12-lead ECG if patient has new onset active chest pain or change in condition.
- Verify medications given prior to transport arrival.
- **NITROGLYCERIN** 0.4 mg sublingual every 5 minutes for 3 doses as needed for chest pain. Use with caution in STEMI, especially right ventricle or inferior STEMI. NTG is effective for unstable angina presentations and not some much for fixed occlusions, such as an acute MI.
- **MORPHINE** or **FENTANYL** can be used for pain. **FENTANYL** is the drug of choice (DOC) for chest pain. See Protocol **(159.405)** for pain management.
- **NITROGLYCERIN INFUSION** 10 mcg/min IV and titrate by 10 mcg/min every 5 minutes until chest pain resolves or Systolic Blood Pressure less than 100 mm/hg or MAP less than 65 mmHg.
- If patient becomes hypotensive, administer 500 mL of Normal Saline, discontinue any **NITROGLYCERIN** preparations (look for patches and ointment on the patient's skin) and reassess patient. May repeat **NORMAL SALINE BOLUS**, max 2L.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.305**
	TITLE: INTRA-AORTIC BALLOON PUMP PROTOCOL	**Effective Date 11/01/2021**

Classification of Transport: CCT with RRT/Flight

CLINICAL INDICATIONS

LV failure
AMI/ Acute Heart Failure
Cardiogenic shock

- Check the physician's order for transport and obtain criteria for helicopter transport
- Identify patient, explain transport procedure, and perform a complete assessment.
- Upon Intra-Aortic Balloon (IAB) catheter insertion, the following shall be documented in the patient record
  -IAB insertions site
  -Physician inserting Balloon catheter
  -Visualization of correct placement and full inflation of the balloon via fluoroscopy by the physician via following methods-
  a. viewing of CXR by RT
  b. viewing of fluoroscopy by RT
  c. if unable to complete A or B then, confirm with the inserting physician.
  -Catheter type
  -Catheter serial number
  -Catheter size and volume
  -Technique of insertion (sheath or sheath-less)
  -Indications for placement
  -A timing strip from the pump while on 1:3 ratio indicating proper timing and inflation of the balloon catheter.
- Obtain consent for transport.
- Obtain a copy of the patient's chart, x-rays, heart catheterization films, etc, before moving the patient.
  -Check the chest x-ray for balloon placement and document.
  -Mark the position of the catheter at insertion site before moving the patient.

- Document the condition of the groin insertion site, dressing, distal pulses and capillary refill.
- Assess IV fluids, rate, needle site, tubing and make the necessary changes for the use of transport infusion pumps.
- Change arterial line and Swan Ganz transducers/flush systems for compatibility of monitoring systems.
- Plug in IABP module to AC power receptacle. Establish power by pushing the IABP on/off switches to on position and system now begins a self-check. Once self-check is successful the “System Test OK” message appears. Turn the helium supply on.
- Place ECG skin leads/back patch on patient and monitor IABP scope. Select desired lead (usually II, CS300 chooses lead automatically), with largest R-wave (at least >14mv), best indicated by observing triggering indicator flashing with each R-wave.
- Zero Pressure transducer. Initially the message will display “No Zero” indicating the need to zero the transducer.
  a. Open transducer vent to atmosphere
  b. Press Zero Pressure Key and hold for 2 seconds, Two audible clicks will sound and the automatic process is performed.
  c. Close pressure transducer vent to atmosphere. Check that the pressure waveform is displayed and the Systolic/Diastolic and Mean displays functional at this time.
  d. Pressure waveform can be automatically (on CS300) or manually scaled. To select scaling, go to user options screen – press preferences menu 0 preferences displayed- press change/select, using down arrow key got to pressure scale, press change/select to select desired pressure range: Auto/0-80/ 0-160/ 0-300.
- Ensure all pre transport assessments and interventions are complete prior to placing the patient on the transport IABP.
- While patient remains on sending units IABP console, establish EKG tracing on transport IABP unit.
- Transfer the patient to IABP module.

- Prepare for and initiate counter pulsation at prescribed ratio:
  A. initial settings:
     1. Timing-auto
     2. During initial assessment a “1:3” temporary tracing strip is to be produced for accurate timing and augmentation.
     When timing and augmentation has been achieved, the RT will return the IABP to the ratio ordered by the physician
     3. IAB fill- Auto
     4. IABP augmentation – minimum
     5. IABP inflation- IABP deflation
  B. Verify timing
  C. Fill IABP: depress “Assist/Standby” key for two seconds. ”Auto filling” message will appear on monitor. Proceed to next step when message clears.
  D. Start pumping
  E. Optimizing augmentation: the system will progressively increase augmentation on each successive pump cycle until the MAX level is reached.
  F. SET AUGMENTATION ALARM: Adjust, if needed, by pressing “Aug. Alarm” key and using the arrow keys to change the value displayed on the screen [set alarm 20mmHg below current augmented pressure, minimum activation 90mmHg]
- Prepare the patient and transport to the helicopter/ EMS stretcher.
  a. Determine that the patient is completely ready for transport. Make sure safety straps are in proper placement and secure.
  b. Disconnect AC power cord and continue on internal battery for loading.
  c. Transport patient immediately to helicopter or EMS truck.
  d. Upon arrival at the helicopter / EMS truck:
     1. Load the patient into the unit and secure the stretcher in the lockdown mount.
     2. Load the IABP module into the unit and secure appropriately,
     3. Use extreme caution with all lines during loads and unloads. If inadvertent disconnection occurs, EMERGENTLY reattach the patient balloon to the safety chamber and refill the balloon. Continue pumping.
  e. Continuous monitoring will be maintained throughout the transport and further documentation will be done on the RN/RT notes.
- “6 sec Strips” noting ECG and IABP waveforms will be documented every 10 minutes or as the patient condition warrants.

- Monitor all tubing for connectivity, blood, and/or possible dislodgement. If blood is noted within the helium tubing, clamp the tube, turn off the pump console and contact sending MD, receiving MD or medical control for further orders.
- The flight RN or RRT will operate and manage the IABP during the patient transport. The RT will operate and manage the IABP during critical care ground transport with assistance of the CCRN.

TROUBLESHOOTING:

Cardiac Arrest: Do not shut off pump- Please note IABP will function independently of compressions.(CS 300)

Cardiac arrest with Ventricular Fibrillation-there will be no harm to the IABP unit when defibrillation is performed. NOTE: Pump will restart automatically upon return of spontaneous circulation.

Balloon rupture: when the balloon leaks one of the following may occur:

a. Blood in the IABP catheter
b. Augmentation may be changed
c. IABP may alarm.

Procedure:

1. If blood is discovered in the IAB catheter, turn intra-aortic balloon off, clamp the helium line, and disconnect the IAB catheter from the IABP console.
2. NOTE: NEVER manually inflate a ruptured balloon.
3. Notify physician STAT of blood in balloon.

IABP failure:

1. Check and tighten the connections on the pneumatic tubing (a loose connection may contribute to a loss of vacuum)
2. Check the balloon pump power source to ensure power is available to operate the machine.

NOTE: IABP console should be plugged into approved outlet at all times (except during transport)

3. If unit fails, manually inflate and deflate the balloon every 5 minutes with half of the total balloon volume to prevent clot formation along the dormant balloon. Continue until a replacement balloon pump console can be replaced.
4. Document the occurrence.
5. Notify patient's physician via dispatch stat.

Addendum for AutoCat Pump

1. Power: plug in power cord
    - Turn on switch located in the recessed area just below the direct patient connections
2. Helium
    - Verify helium supply
3. connect ECG source
    - Connect ECG signal using Skin Cable
4. Verify trigger recognition as indicated by the following:
    - –Presence of assist markers under the ECG
    - –Flashing heart next the HR on the display
5. Connect the Arterial Pressure signal
    - –Connect the arterial pressure signal using the transducer cable
6. Connect IAB catheter
    - –Verify correct volumes
7. Select / verify operation mode
8. initiate pumping
    - Press assist key
9. Assess timing

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.306A**
	TITLE: VENTRICULAR ASSIST DEVICE (VAD)	**Effective Date 01/12/2022**

Classification of Transport: CCT/Flight

A ventricular assist device (VAD) is a battery powered pump that augments blood flow throughout the body. It provides mechanical support for the heart in cases of severe heart failure. A pulse may not be palpable in patients with a VAD. A typical, manual or automatic (NIBP) blood pressure measurement is usually not obtainable.

Your primary assessment must include a VAD assessment. If a patient is unresponsive and pulseless, assess weather or not the VAD pump is running. A mechanical sound heard over the heart should indicate if the pump is powered-on and running.

If the VAD patient is unresponsive, apneic, pulseless and no "pump sounds" to indicate blood flow, CPR is indicated until blood flow is restored, or the resuscitation attempt is ended with the pronouncement of death. All efforts should be made to restore pump function, such as, replacing batteries and/or the VAD Controller unit.

ALL VAD patients must be monitored by and transported with, Hospital credentialed, "VAD Competent" Staff.

Use of a doppler and Manual BP Cuff is required to estimate a MAP. Place the BP Cuff on a patient, find the doppler signal over the distal artery, closest to the cuff, inflate the cuff until the signal is lost and slowly deflate the BP cuff. Return of a doppler signal is the estimated MAP.

Patients should maintain a MAP of 65-90 during transport. Pulse oximetry may not be accurate in LVAD patients. Auscultate heart sounds to determine if the LVAD device is correctly functioning. You should only hear a continuous pumping sound only. You will not hear normal S1S2 heart sounds.

BLS CARE:

- Airway support as necessary
- Record blood glucose and vital signs as per protocol.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

CCT/FLIGHT CARE:

- Establish/Continue cardiac monitoring.
- Assess the patient's airway and intervene as necessary, per protocol.

- Check the VAD's power source (Batteries)
- Bring all VAD Equipment with the patient, i.e. extra batteries, extra controller, AC power adapter etc..
- Check all VAD connections
- Inspect the driveline and insertion site in the patient's body wall. Maintain a clean, dry dressing over the insertion site.
- All arrhythmias should be treated according to ACLS protocols.
- Treat pain and nausea per protocol, as needed.
- **NORMAL SALINE**, as needed in 250mL aliquots to resolve hypovolemic suction events.

- Patient and their families are good resources for information regarding the LVAD. They can provide information regarding type of device, extra batteries, and battery chargers.

- For Patients with MAP less than 65mmhg begin **EPINEPHRINE** infusion, as per protocol. Resuscitation goals are a MAP of 65 mmHg and end organ perfusion.

- Contact Medical Direction via Dispatch with questions, or on-line Medical Control.

- The VAD COORDINATOR is also an excellent resource, Contact info is usually posted on the controller module.

AdventHealth Orlando	AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care	Protocol Number 159.307
	TITLE: **NARROW COMPLEX TACHYCARDIA >150 BPM)**	Effective Date 11/01/2021

Classification of Transport: ALS

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

ALS CARE:

- Perform Valsalva maneuvers

UNSTABLE:

If patient demonstrates any signs of instability including, but not limited to altered mental status, ongoing chest pain, hypotension or signs of shock, PERFORM IMMEDIATE SYNCHRONIZED CARDIOVERSION.

Do not delay cardioversion to place an IV or give sedation

KETAMINE 0.5 to 1 mg/kg Slow IV Push may be given for dissociative sedation for Cardioversion. Strict airway monitoring with waveform EtCO2 and Pulse oximetry. Airway management equipment at the ready.

ZOLL MONITOR:

- Synchronized Cardioversion at 50 Joules Biphasic
- Synchronized Cardioversion at 100 Joules Biphasic
- Synchronized Cardioversion at 120 Joules Biphasic
- Synchronized Cardioversion at 150 Joules Biphasic
-

LIFEPAK 15 - (As Applicable)

- Synchronized Cardioversion at 100 Joules
- Synchronized Cardioversion at 150 Joules
- Synchronized Cardioversion at 200 Joules
- All Subsequent Cardioversions at 200 Joules

STABLE:

- IV access, saline lock.
- Obtain 12-lead ECG.
    - If tachycardia is REGULAR rhythm attempt vagal maneuvers (Valsalva, cough, breath holding).

- **ADENOSINE** 6 mg *RAPID* IV push, if no response within 1-2 minutes give additional 12 mg times one dose *RAPID* IV push.
- If rhythm does not convert, **DILTIAZEM** 0.25mg/kg IV slow push.
- May repeat 15 minutes later **DILTIAZEM** 0.35mg/kg IV slow push.

- If **Diltiazem** unavailable give **METOPROLOL** (Lopressor) 5 mg IV over 2-5 minutes and may repeat as needed to maximum of 15 mg.
- Do not give both calcium channel blockers and beta-blockers, chose one or the other, not both.
- IV Fluids and Push Dose pressors are appropriate as needed for hypotension post conversion, see Hypotension and Shock Protocol ***(159.417)***.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.308**
	TITLE: N-STEMI- CHEST PAIN OF CARDIAC ORIGIN	**Effective Date 11/01/2021**

Classification of Transport: ALS

The risk for cardiac arrest and critical decompensation can be equal to and at times exceed those of STEMI patients. Patients being transported directly to the cardiac catheterization lab may require time sensitive interventions and transport.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- **ASPIRIN** 162 mg PO if not previously given with in last 24 hours and no contraindications. Check for Aspirin allergy prior to administration.

ALS CARE:

- IV access with saline lock.
- Establish/Continue cardiac monitor.
- View 12 lead EKG to determine EKG changes. If inferior MI then get right sided EKG.
- Obtain 12-lead ECG if patient has new onset active chest pain or change in condition.
- Verify medications given prior to transport arrival.
- **NITROGLYCERIN** 0.4 mg sublingual every 5 minutes for 3 doses as needed for chest pain. Use with caution in STEMI, especially right ventricle or inferior STEMI. NTG is effective for unstable angina presentations and not some much for fixed occlusions, such as an acute MI.
- **MORPHINE** or Fentanyl can be used for pain. **FENTANYL** is the drug of choice (DOC) for chest pain. See Protocol 159.405 for pain management.
- **NITROGLYCERIN INFUSION** 10 mcg/min IV and titrate by 10 mcg/min every 5 minutes until chest pain resolves or Systolic Blood Pressure less than 100 mm/hg or MAP less than 65 mmHg.
- If patient becomes hypotensive, administer 500 mL of Normal Saline, discontinue any **NITROGLYCERIN** preparations (look for patches and ointment on the patient's skin) and reassess patient. May repeat **NORMAL SALINE BOLUS**, max 2L.
- Verify **HEPARIN** orders and protocol to be used.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.309**
	TITLE: POST INVASIVE CARDIOLOGY PROCEDURE	**Effective Date 11/01/2021**

Classification of Transport: ALS

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Visually inspect insertion site.
- Repeat visualization of sheath site every 10 min and after each patient transfer.
- Check bilateral pedal pulses every 10 min and after each patient transfer.
- Check bilateral upper extremity blood pressures if not obtained status post procedure.
- If bleeding begins hold direct pressure.
- Keep patient in position per physician orders with minimal extremity movement.
- Monitor for unstable vital signs, altered mental status, unstable angina, bleeding or hematoma at insertion site, diminished pulses, cool extremity, pain in affected limb, allergic reaction, persistent groin or abdominal pain, decreased urinary output.
- Post cardiac catheterization all patients should be monitored for arterial bleeding and pseudo-aneurysm. Continually re-evaluate catheterization site as well as abdomen and lower back for expanding hematoma, rebound, guarding and rigidity of the abdominal wall.

ALS CARE:

- Establish/continue cardiac monitor.
- Review or perform post procedure ECG.
- Treat as needed per Shock protocol. ***(159.417)***
- If oozing or hematoma develops at the insertion site, expose the site and hold manual pressure until homeostasis is achieved (minimum of 20 minutes). While holding pressure observe capillary refill time, color and temperature.
- **MORPHINE** 2- 4 mg IV push every 3-5 minutes for pain for maximum dosage 10 mg.
- For hemodynamically unstable patients (SBP less than 100mmhg):
- **FENTANYL** 50 mcg IV or 100 mcg intranasal via MAD every 5 minutes for pain to maximum dosage 250 mcg.
- Nausea and vomiting per protocol. ***(159.415)***
- Visually inspect the sheath insertion site (if present) and mark the site for later verification of placement.
- Note sheath size and document.

- Observe insertion area for swelling, hematoma, tenderness, ecchymosis or bleeding. Note presence of any bleeding on dressing and monitor.
- Check and document bilateral lower extremity pulses, capillary refill time, color and temperature. Recheck every 10 minutes or after every patient move. Observe for diminished pulses, coldness or pain in the catheterization extremity.
- If bleeding begins hold direct pressure. While holding pressure observe capillary refill time, color and temperature. Document time of onset of bleeding and amount of time pressure held. Inform receiving unit on arrival.
- If oozing or hematoma develops at the insertion site, expose the site and hold manual pressure. While holding pressure observe capillary refill time, color and temperature. Document and inform receiving unit on arrival.
- On arrival to receiving unit, visually inspect the insertion site with RN accepting patient. Observe insertion area for swelling, hematoma presence, tenderness, ecchymosis or bleeding. Note presence of any bleeding on dressing and monitor if present. Check and document bilateral lower extremity pulses, capillary refill time, color and temperature.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.310**
	TITLE: ACUTE STEMI PROTOCOL	**Effective Date 11/01/2021**

Classification of Transport: ALS

The Acute ST Elevation Myocardial Infarction (STEMI) is a time sensitive pathology. Crews should maintain a sense of urgency at all times. Facilitate the immediate transport to the appropriate patient care destination. All care givers should be vigilant in their monitoring for life-threatening arrhythmias, which may develop at any time.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Keep NPO
- Obtain copy of most recent 12-lead ECG; however, transport shall not be delayed awaiting copies.
- Obtain history, include all treatments from sending facility: ASA, beta blockers, nitroglycerin, morphine, and oxygen.
- Identify reason for Code STEMI activation.
- Identify accepting cardiologist and room location for catheterization suite.

ALS CARE:

- IV access with saline lock.
- IV fluid given per Shock protocol. ***(159.417)***
- Verify medications given prior to transport arrival.
- Establish / continue cardiac monitor.
- Review / obtain ECG, observe for the presence of V4R on right sided ECG. Identify ST elevation in greater than or equal to 1mm in 2 contiguous leads, ST segment elevation greater than or equal to 2 mm (precordial leads) or LBBB known to be new onset.
- Report all changes on 12-lead ECG's to accepting clinician.
- Nausea / vomiting per protocol. ***(159.415)***
- **ASPIRIN** 162 mg PO if not previously given and no contraindications
- **NITROGLYCERIN** 0.4 mg sublingual every 5 minutes for a total of 3 doses until chest pain is relieved or Systolic Blood Pressure less than 100 mmHg, MAP less than 65 mm/Hg. Use with caution in the presence of a right sided infarct / Inferior Wall MI
- **MORPHINE** 2 to 4 mg IV push every 3-5 minutes for pain for maximum dosage 10 mg.
- For hemodynamically unstable patients (SBP less than 100mmHg):

- **FENTANYL** 50 mcg IV or 100 mcg intranasal via MAD every 5 minutes for pain to maximum dosage 250 mcg.
- **NITROGLYCERIN INFUSION** 50 mg in 250 mL D_5W or Normal Saline (200 mcg/mL) titrate by 10 mcg/min every 3 to 5 minutes until chest pain is relieved or Systolic Blood Pressure less than 100 mm/Hg or MAP less than 65 mm/Hg.
- Verify **HEPARIN** orders and protocol to be used.

FLIGHT/ CRITICAL CARE TEAM:

IF RETAVASE (reteplase) ORDERED

- Ensure exclusion criteria completed and patient consent.
- Time ordered by physician. TIME_____
- Reteplase 10 units intravenous now. Administer over 2 minutes.

  TIME_____
- Reteplase 10 units intravenous 30 minutes after the first dose. Administer over 2 minutes. TIME_____
- Neuro assessment initially and after each dose of Reteplase

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.311**
	TITLE: VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA	**Effective Date 11/01/2021**

Classification of Transport: ALS

A patient who develops cardiac arrest must receive CPR and/or defibrillation as clinically indicated. ***Witnessed*** */* ***Unwitnessed*** *cardiac arrest requires defibrillation as soon as possible with an Automated External Defibrillator (AED) or defibrillator.*

BLS CARE:

- Begin CPR per AHA guidelines.
  - Check for unresponsiveness with apnea (including agonal gasps)
  - Immediately initiate help for additional resources
  - CPR performed at 30 compressions: 2 ventilations.
  - Push hard and fast (at least 100-120/min)
  - Ensure full chest recoil
  - Minimize interruptions in chest compressions, 10 seconds or less
- Attach and use AED on BLS truck as soon as possible with witnessed arrest (see AED Procedure **159.302**).

ALS CARE:

- Place an advanced airway device (Advanced Airway Protocol) ***(159.201)***
- Establishment of IV/IO, airway and medication administration should occur during CPR and should not interrupt the CPR cycles.
- Perform defibrillation as clinically indicated:

ZOLL MONITOR:

200 Joules Biphasic and all subsequent shocks should also be at 200 Joules Biphasic.

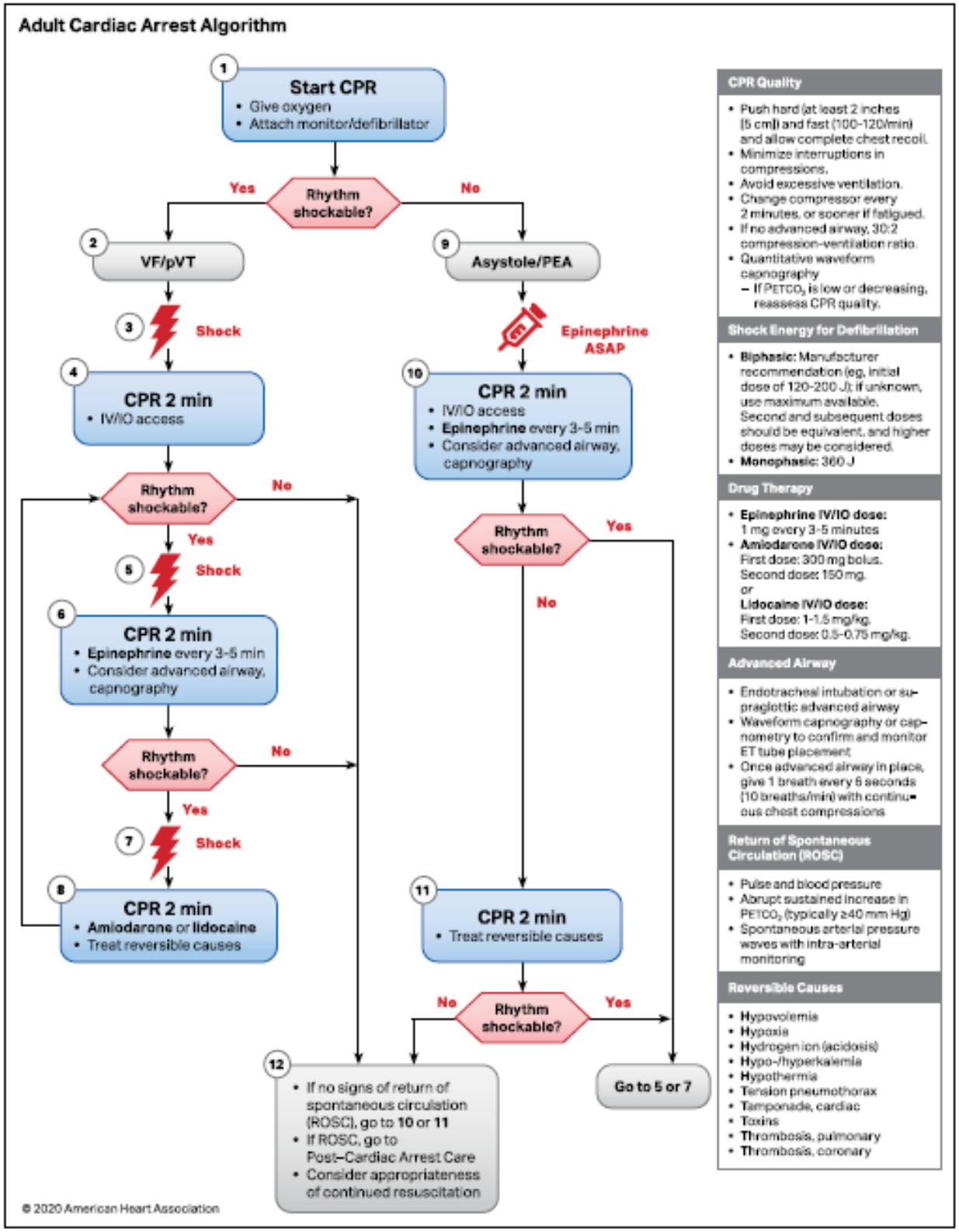
LIFEPAK 15 – (As Applicable)

1st Defibrillation – 200 Joules
2nd Defibrillation – 300 Joules
3rd Defibrillation – 360 Joules
All Subsequent Defibrillations – 360 Joules

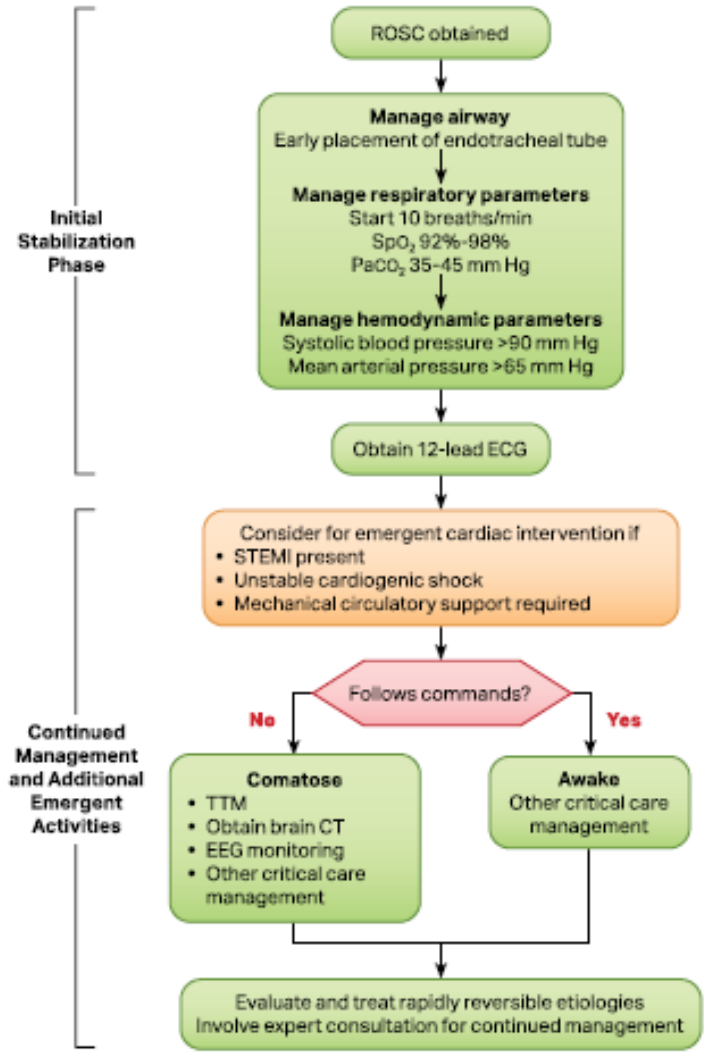
- Resume CPR immediately after performing defibrillation.
- Perform 5 cycles / 2 minutes of CPR and reanalyze rhythm. Perform defibrillation as clinically indicated.

- If VF/VT converts to another rhythm post defibrillation, refer to appropriate protocol for further treatment.
- **EPINEPHRINE** 1:10,000 1 mg IV/IO push every 3-5 minutes**.**
- **AMIODARONE** 300 mg IV/IO push. If VF/VT persists repeat in 3 to 5 minutes, **AMIODARONE** 150 mg IV/IO times one dose.
- **MAGNESIUM SULFATE** 1 to 2 grams diluted in 10 mL of Normal Saline IV/IO for Torsades de Pointes or hypomagnesemia.

ACTIVATE RAPID RESPONSE AND ADVISED THE DESTINATION FACILITY OF THE CHANGE IN PATIENT CONDITION


Adult Cardiac Arrest Algorithm
1
Start CPR
• Give oxygen
• Attach monitor/defibrillator
Rhythm shockable?
Yes
No
2
VF/pVT
3
Shock
4
CPR 2 min
• IV/IO access
Rhythm shockable?
No
Yes
5
Shock
6
CPR 2 min
• Epinephrine every 3-5 min
• Consider advanced airway, capnography
Rhythm shockable?
No
Yes
7
Shock
8
CPR 2 min
• Amiodarone or lidocaine
• Treat reversible causes
9
Asystole/PEA
Epinephrine ASAP
10
CPR 2 min
• IV/IO access
• Epinephrine every 3-5 min
• Consider advanced airway, capnography
Rhythm shockable?
Yes
No
11
CPR 2 min
• Treat reversible causes
Rhythm shockable?
No
Yes
12
• If no signs of return of spontaneous circulation (ROSC), go to 10 or 11
• If ROSC, go to Post–Cardiac Arrest Care
• Consider appropriateness of continued resuscitation
Go to 5 or 7
© 2020 American Heart Association
CPR Quality
• Push hard (at least 2 inches [5 cm]) and fast (100–120/min) and allow complete chest recoil.
• Minimize interruptions in compressions.
• Avoid excessive ventilation.
• Change compressor every 2 minutes, or sooner if fatigued.
• If no advanced airway, 30:2 compression–ventilation ratio.
• Quantitative waveform capnography
– If PETCO2 is low or decreasing, reassess CPR quality.
Shock Energy for Defibrillation
• Biphasic: Manufacturer recommendation (eg, initial dose of 120–200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
• Monophasic: 360 J
Drug Therapy
• Epinephrine IV/IO dose: 1 mg every 3–5 minutes
• Amiodarone IV/IO dose: First dose: 300 mg bolus. Second dose: 150 mg.
or
Lidocaine IV/IO dose: First dose: 1–1.5 mg/kg. Second dose: 0.5–0.75 mg/kg.
Advanced Airway
• Endotracheal intubation or supraglottic advanced airway
• Waveform capnography or capnometry to confirm and monitor ET tube placement
• Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions
Return of Spontaneous Circulation (ROSC)
• Pulse and blood pressure
• Abrupt sustained increase in PETCO2 (typically ≥40 mm Hg)
• Spontaneous arterial pressure waves with intra-arterial monitoring
Reversible Causes
• Hypovolemia
• Hypoxia
• Hydrogen ion (acidosis)
• Hypo-/hyperkalemia
• Hypothermia
• Tension pneumothorax
• Tamponade, cardiac
• Toxins
• Thrombosis, pulmonary
• Thrombosis, coronary

Adult Post–Cardiac Arrest Care Algorithm



Initial Stabilization Phase

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management: Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters: Titrate FiO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to $PaCO_2$ of 35–45 mm Hg
- Manage hemodynamic parameters: Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

- Emergent cardiac intervention: Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
  - Continuously monitor core temperature (esophageal, rectal, bladder)
  - Maintain normoxia, normocapnia, euglycemia
  - Provide continuous or intermittent electroencephalogram (EEG) monitoring
  - Provide lung-protective ventilation

H's and T's

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypokalemia/hyperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.312**
	TITLE: WIDE COMPLEX TACHYCARDIA WITH PULSE	**Effective Date 11/01/2021**

Classification of Transport: ALS

BLS CARE:

- BLS primary survey
- **OXYGEN** per therapy protocol ***(159.208)***

ALS CARE:

- Obtain IV access
- Establish/Continue cardiac monitor
- If stable, obtain12 lead ECG

STABLE:

- Regular Monomorphic Tachycardia
- **ADENOSINE** 6 mg *RAPID* IV push, if no change in rate, rhythm or interval then:
- For a regular rhythm wide complex tachycardia with a rate greater than 150 BPM, **AMIODARONE** 150 mg IV over 10 minutes.

UNSTABLE:

- If patient demonstrates any signs of instability including, but not limited to altered mental status, ongoing chest pain, hypotension with signs of shock, PERFORM IMMEDIATE SYNCHRONIZED CARDIOVERSION.

Do not delay cardioversion to place an IV or give sedation

KETAMINE 0.5 to 1 mg/kg Slow IV Push may be given for dissociative sedation for Cardioversion. Strict airway monitoring with waveform EtCO2 and Pulse oximetry. Airway management equipment at the ready.

ZOLL MONITOR:

- Synchronized Cardioversion at 100 Joules Biphasic
- Synchronized Cardioversion at 120 Joules Biphasic
- Synchronized Cardioversion at 150 Joules Biphasic

LIFEPAK 15 – (As Applicable)

- Synchronized Cardioversion at 100 Joules
- Synchronized Cardioversion at 150 Joules
- Synchronized Cardioversion at 200 Joules
- All Subsequent Cardioversions at 200 Joules

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.401**
	TITLE: ABDOMINAL AORTIC ANEURYSM	**Effective Date 11/01/2021**

Classification of Transport: ALS

Monitor for back pain. Palpate the abdomen and groin for pulsatile masses. Prior to administration of Beta Blockers verify the usage, dosage, heart rate and blood pressure parameters with the sending or receiving physician.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Keep patient NPO

ALS CARE:

- IV access with saline lock.
- Establish/continue cardiac monitor.
- It is important to control the blood pressure. The goal of blood pressure therapy is to maintain Systolic Blood Pressure less than 160 mm/Hg and Diastolic Blood Pressure less than 90 mmHg.
- Pain Control as per Protocol 159.405
- Nausea Control as per Protocol 159.415

- **LABETALOL** 10 mg IV push over 4 minutes every 10 minutes, x 2 doses to maintain Systolic Blood Pressure less than 160 mmHg and Diastolic Blood Pressure less than 90 mmHg. Hold if HR less than 60.

FLIGHT/ CRITICAL CARE TEAM:

- **NICARDIPINE (CARDENE) INFUSION** 5mg/hr *Titrate* by 1 to 2.5 mg/hr every 15 to 20 min. to 15 mg/hr to physician specified parameters or SBP > 90. Dose should NOT exceed 15 mg/hr. SEE CHART BELOW

Contact Medical Direction, as needed

Rate Chart for niCARdipine 20 mg/200 mL or 25 mg/250 mL (0.1 mg/mL)

DOSE (mg/hr)	RATE (mL/hr)
2.5	25
5	50
7.5	75
10	100
12.5	125
15	150

Rate Chart for niCARdipine 40 mg/200 mL or 50 mg/250 mL (0.2 mg/mL)

DOSE (mg/hr)	RATE (mL/hr)
2.5	12.5
5	25
7.5	37.5
10	50
12.5	62.5
15	75

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.402**
	TITLE: ABDOMINAL PAIN	**Effective Date 11/01/2021**

Classification of Transport: ALS

Abdominal pain assessment and management should contain time of onset. Describe if it is intermittent or constant, and specific location. Back pain and flank pain should be included in the assessment. Look for a discrepancy in upper extremity blood pressures.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Keep patient NPO

ALS CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor.
- 500 mL Normal Saline bolus, may repeat 500 ml bolus,
- **FAMOTIDINE 20** mg mixed in 100 mL Normal Saline. Administered over 10 minutes; if not given in the last 12 hours.
- **PAIN CONTROL AS PER PROTOCOL 159.405**
- **NAUSEA CONTROL AS PER PROTOCOL 159.415**

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.403**
	TITLE: ALLERGIC REACTION/ANAPHYLAXIS	**Effective Date 11/01/2021**

Classification of Transport: ALS

Anaphylaxis is a systemic allergic reaction which may result in complete obstruction of the airway, cardiovascular collapse and death. Signs and symptoms may include but are not limited to laryngeal spasm, angioedema, bronchospasm, stridor wheezing, uticaria, vomiting, diarrhea, and flushed or pale skin. Attempt to identify and remove patient from any further exposure to allergen.

BLS CARE:

- BLS primary survey.
- Attempt to calm / Stop or remove offending agent if available.
- Monitor SpO2
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Place patient in supine position.
- Keep patient warm, vasodilatation may cause rapid cooling.

ALS CARE:

- Establish IV x 2 with Normal Saline.
- Shock protocol as needed. ***(159.417)***
- Obtain ECG.
- Be prepared to initiate Advanced Airway Protocol as needed. ***(159.201)***

Allergic Reaction without airway compromise patient is alert and oriented and Systolic Blood Pressure greater than 90mmHg:

- **DIPHENHYDRAMINE** 1 mg/kg IV or IM with maximum of 50 mg.
- **FAMOTIDINE 20** mg mixed in 100 mL Normal Saline. Administered over 10 min.
- **METHYLPREDNISOLONE** 125 mg slow IV push.

Allergic Reaction with airway compromise, systemic signs of anaphylaxis, Systolic Blood Pressure less than 90 mmHg, shortness of breath, and/or diminished breath sounds.

- **EPINEPHRINE 1:1,000** 0.5 mg IM every 5 minutes to maximum 3 doses.
- **ALBUTEROL** 2.5 mg via updraft. Repeat as needed.
- **ATROVENT** 0.5 mg with each **ALBUTEROL** administration.
- **DIPHENHYDRAMINE** 1 mg/kg IV or IM with maximum of 50 mg.

- **FAMOTIDINE** 20 mg mixed in 100 mL Normal Saline. Administered over 10 minutes.
- **METHYLPREDNISOLONE** 125 mg slow IV push.
- For persistent Hypotension or SHOCK see Protocol **(159.417)**

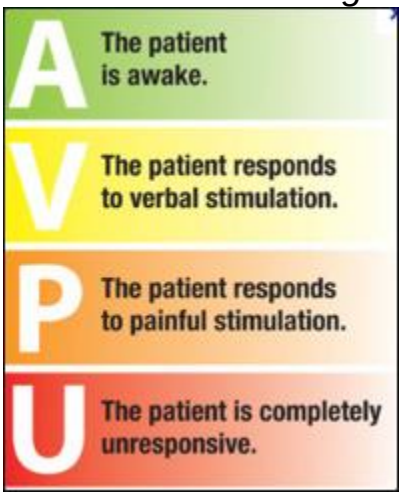
CCT/FLIGHT CARE:

- If airway becomes compromised refer to the Rapid Sequence Airway Protocol. ***(159.210)***

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.404**
	TITLE: ALTERED MENTAL STATUS	**Effective Date 11/01/2021**

Classification of Transport: ALS

Determine the patient's level of consciousness using AVPU assessment.



Try to determine cause of altered mental status/unconsciousness using available information. Maintain patient's airway and assess circulatory system. Continuously monitor heart rate, blood pressure, respiratory rate, SPO_2, and cardiac rhythm.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Assess circulatory system, heart rate, blood pressure, cardiac rhythm
- Obtain blood glucose level
- Monitor EtCO2
- If blood glucose is 70 mg/dL or less, and patient has no signs of difficulty swallowing, administer one tube of **ORAL GLUCOSE** gel.

ALS CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor.
- Obtain 12 lead ECG
- ***HYPOGLYCEMIA:***
  - **DEXTROSE 50%** 25 grams IV for glucose 50 - 70 mg/dL.
  - **DEXTROSE 50%** 50 grams IV for glucose less than 50 mg/dL
  - Re-evaluate after 15 minutes. If no change in hypoglycemic signs and symptoms, administer **DEXTROSE** 50% 25 grams IV.
  - If no IV access, administer **GLUCAGON** 1 mg IM.

- ***OPIATE OVERDOSE:***
  - **NALOXONE** 0.4 mg IV/IM/IN every 2 minutes to a maximum of 4 mg or until respiratory compromise resolves.
- ***STROKE:***
  - If stroke is suspected, see Stroke/CVA protocol. ***(159.418)***
  - If inter-cerebral hemorrhage suspected, see inter-cerebral hemorrhage protocol. ***(159.414)***
  - Consider Advanced Airway Management as per Protocol ***(159.201)***

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.405**
	TITLE: ANALGESIA/PAIN MANAGEMENT	**Effective Date 11/01/2021**

Classification of Transport: ALS

Patients who receive narcotics will have an assessment done every 10 minutes per AdventHealth EMS Department (ADHEMS) narcotic protocol. Pt assessment shall include RASS score, respiratory rate, pulse rate, SpO_2 and blood pressure. Upon delivery of patient to accepting unit, the accepting nurse shall be informed of type of narcotic administered, dose, route, time of administration, and update on assessment since receiving narcotic. All of above shall be documented in the narrative and / or scores portion of the electronic medical record. Patients who have received ***NARCAN*** *in the past 24 hours shall not receive narcotics.*

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

ALS/CCT/Flight CARE:

Choose opioid analgesia based upon patient condition, allergies and destination. Patients with potential hemodynamic instability should receive **FENTANYL***. Patients being transported to ICU, cardiac catheterization lab, or an operating room (OR holding included) may receive* **FENTANYL** *for pain management. Patients who are hemodynamically stable, decreased likelihood of conscious sedation and not going to the operating room, ICU or catheterization lab should receive* **MORPHINE***.*

- Obtain IV access.
- Establish/Continue cardiac monitor.
- Pre and Post administration of narcotics, the electronic medical record must include RASS score, reassess pain scale, oxygenation, ventilation of patient, EtCO2, and vital signs.
- All patients who receive narcotics within the previous 60 minutes and during transport shall have constant EtCO2 monitoring.

- **MORPHINE** 0.05-0.1 mg/kg IV or IM q15 minutes for pain to maximum dosage 10 mg.
  OR
- **FENTANYL** 0.5-1 mcg/kg IV / IM q15 minutes or 100 mcg intranasal via MAD every 15 minutes for pain to maximum dosage 250 mcg.

Consider supplemental/adjunctive medications as needed:

- Add **KETOROLAC** 15 to 30 mg IV or 30 to 60 mg IM for Adults, without cardiac or renal pathology. Peds 0.5mg/kg max 30mg. Hold if given within last 6 hours.
- Treat Nausea with **ONDANSETRON** 8mg IV/IN for Adults, PEDS 0.15mg/kg up to 4mg. See Protocol ***(159.415)***
- Add **DIPHENHYDRAMINE** 1mg/kg IV/IM up to 50mg, as needed for itching
- For persistent pain, consider adding **KETAMINE** at 0.25 mg/kg IV Slow push

Contact Medical Direction if more analgesia is required.

RICHMOND AGITATED SEDATION SCALE

Score	Term	Description
+4	Combative	Overtly combative or violent and an immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert but has sustained (> 10 seconds) awakenings, with eye contact, to voice
-2	Light sedation	Briefly (< 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimuli
-5	Unarousable	No response to voice or physical stimulation

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.406**
	TITLE: BEHAVORIAL AND PSYCHOLOGICAL EMERGENCIES	**Effective Date 11/01/2021**

Classification of Transport: ALS

Approach every patient cautiously to protect yourself and your crew from injury. Be suspicious of life threatening emergencies. Remove anyone who agitates the patient or adds confusion at the scene.

BLS CARE:

- Listen to patient.
- Ask open-ended questions.
- Do not rush patient history.
- Communicate honestly and with professionalism.
- Do not threaten patient in any way.
- Keep a safe distance.
- Avoid appearing judgmental.
- Never lie to a patient.

ALS CARE:

Psychosis - a severe mental disorder in which thought and emotions are so impaired that contact is lost with external reality.

Agitation/Anxiety- a state of excessive psychomotor activity accompanied by increased tension and irritability.

- Perform a mental status exam.
  - General appearance, behavioral observations, orientation, memory, sensorium, perceptual process, mood, and affect, intelligence, thought process, insight, judgment, and psychomotor.

Psychosis:

- **ZIPRASIDONE (GEODON)** 20 mg IM, one dose only. Contraindicated if patient has received Geodon within last 24 hours.

Agitation/Anxiety:

- **HALOPERIDOL (HALDOL)** 5 mg IN/IM/IV, one dose only.
- **LORAZEPAM** 2 mg IN/IM/IV, may repeat in 5 minutes to maximum dose 4 mg.
- All patients post administration, **ZIPRASIDONE (GEODON), HALOPERIDOL (HALDOL)**, and/or **LORAZEPAM**, shall receive cardiac monitor, EtCO2, and SpO2.
- Four point restraints: see restraint policy. ***(159.407)***

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.406**
	TITLE: BEHAVORIAL AND PSYCHOLOGICAL EMERGENCIES	**Effective Date 11/01/2021**

Severe Uncontrolled Agitation, i.e., excited delirium:

In severely agitated patients whose agitation poses an immediate threat to themselves or others. The immediate priority is to stop the uncontrolled agitation and stop the immediate risk of harming themselves or others. Patient and Crew Safety is the priority.

Call for Help from security or Police as needed.

- **KETAMINE** 1 mg/kg IV or 4mg/kg IM maximum dose 500mg. Deltoid or lateral thigh for IM injection sites.

- After administration of **KETAMINE** monitor the airway, ECG, NIBP, SpO2, and waveform EtCO2. See airway management protocol ***(159.201)***.

These cases can be very high profile with high amount of risk

Contact Medical Direction when situation allows if **KETAMINE** is administered.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.407**
	TITLE: BEHAVIORAL RESTRAINTS	**Effective Date 11/01/2021**

Classification of Transport: ALS

Restraint or seclusion may only be imposed to ensure the immediate and physical safety of the patient, a staff member, or others and must be discontinued at the earliest possible time. All patients have the right to be free from physical or mental abuse, and corporal punishment. All patients have the right to be free from restraint or seclusion of any form, imposed as a means of coercion, discipline, convenience, or retaliation by staff.

- Justification for behavioral restraints include, but are not limited to:
  - Threatening or attempting to physically harm others
  - Threatening or attempting to harm self
  - Agitated/potentially explosive and unable to redirect after repeated attempts
  - Violent and aggressive behavior
  - Removing medical equipment
  - Unable to follow directions
  - Interfering with medical treatment

- Prior to the initiation of restraints:
  - See behavioral and psychological emergencies protocol
  - Address cause of patients behavior
  - Attempt to redirect inappropriate behavior.
  - Use comfort measures
  - Set behavioral limits
  - Encourage appropriate anger expression
  - Pain relief, see analgesia protocol
  - Active listening
  - Allow for personal space
  - Toileting/hydration/fluids offered
  - Increased observation
  - Medication given
  - Companion/family at bedside

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.407**
	TITLE: BEHAVIORAL RESTRAINTS	**Effective Date 11/01/2021**

BLS CARE:

- Document that patient is alert and denies any pain from restraints, every 10 minutes during transport.
- Vitals every 10 minutes.
- Perfusion within normal limits on all limbs in restraints.
- Document pt moves all extremities within restraints.
- Skin atraumatic.

ALS CARE:

- Cardiac monitor (when medically indicated).
- Vitals every 10 minutes.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.408**
	TITLE: BLOOD ADMINISTRATION/TRANSFUSION	**Effective Date 11/01/2021**

Classification of Transport: ALS

Proper patient identification must take place at the acceptance of care from sending caregiver. A continuity of identification must exist between the recipient, the name and blood blank number on the armband, the labeled blood, and the compatibility record. If there are any discrepancies, the infusion of all blood products must be stopped.

With patients receiving blood products the EMS team member must confirm with the nurse caring for the patient at the time of transfer that the patient is properly identified. If the name of the patient is not compatible with the armband, compatibility record or has been changed in any way, the blood product infusion needs to be stopped immediately.

If a situation arises where the armband becomes destroyed or is cutoff, the identity of the patient must be maintained. The individual who removed it must immediately put on the armband and the patient's identity must be verified using the hospital bracelet.

No patient shall receive blood products of any kind who is not wearing a Advent Health Blood Bank bracelet and the blood bank number matches that on the Blood Bank Form.

BASIC CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

ADVANCED CARE:

- Establish/Continue cardiac monitor.
- Assess and record vital signs, to include temperature, prior to transfer, and every 5 to 10 minutes en route.
- Reassess patient frequently during transport and document findings.
- Collect all transfer documentation including most recent lab results and Transfusion Report Form attached to blood product.
- At the bedside verify:
    - Patient's correct first and last name
    - Patient's blood bank number
    - Donor blood type

  - Patient blood type
  - Donor number
  - Requested component
  - Expiration date of donor blood component
- If any discrepancies are found, notify the transferring nurse or charge nurse immediately.
- Instruct patient to report onset of any unusual symptoms that might indicate a transfusion reaction which include but are not limited to:
  - Chills
  - Dizziness
  - Back pain
  - Restlessness
  - Nausea
  - Chest pain
  - Headache
  - Anxiety
  - Dyspnea
- Watch for signs of a transfusion reaction which include but are not limited to:
  - Temperature elevation (greater than 2 degrees)
  - Rash/Hives
  - Facial flushing
  - Cyanosis
  - Sweating
  - Bradycardia
  - Tachycardia
  - Hypotension
  - Distended neck veins
- If a transfusion reaction is suspected:
  - Discontinue the transfusion.
  - Disconnect blood set.
  - Do not flush the IV tubing.
  - Save the remaining blood, bag, and tubing.
- Keep IV open with new tubing and normal saline.
- Treat for allergic reaction see allergic reaction protocol. ***(159.403)***

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.409**
	TITLE: DRUG OVERDOSE/POISONING/TOXICOLOGY	**Effective Date 11/01/2021**

Classification of Transport: ALS

Attempt to identify the toxidrome in any suspected drug overdose/poisoning. A toxidrome is set a signs and symptoms caused by a particular drug or toxin. Suspect overdose or poisoning in appropriate clinical setting.

BLS CARE:

- Administer oxygen per oxygen therapy protocol. ***(159.208)***
- Determine blood glucose.
- Monitor SpO2

ALS CARE:

- Establish/continue cardiac monitor
- Monitor EtCO2

CONSIDER CAUSE:

- ***Opiate overdose findings***; central nervous system depression, respiratory depression, Miosis (small pupils). Manage patient airway appropriately prior to **NALOXONE** administration.
- Treatment for patients who demonstrate slow and shallow respiration, need assisted ventilation, are hypotensive or bradycardic, **NALOXONE** 0.4 mg IV / IN every 2 minutes for a maximum of 4 mg. Endpoint of opiate withdrawal is adequate oxygenation and ventilation.

- ***Beta blocker overdose findings***; cardiac arrhythmias, shock, hypoglycemia, seizures, bradycardia, and decreased level of consciousness.
- Treatment for patients demonstrating beta blocker overdose symptoms via appropriate protocols.

- ***Cocaine toxicity findings***; hyperpyrexia, tachycardia, altered mental status, euphoria, fatigue, elevated blood pressure, and hypoxia.
- Treatment for patients demonstrating cardiopulmonary complications, arrhythmias, neurologic CNS complications and altered mental status. **LORAZEPAM** 2 mg IV / IM / IN and may repeat times one dose.
- For seizures see Protocol **(159.416)**.

- ***Tricyclic antidepressants findings***; altered mental status, sinus tachycardia, prolongation of QT interval, delirium, mydriasis (dry eyes), urinary retention, coma, seizures, QRS widening, hypotension, cardiac arrhythmias,
- Treatment for patients demonstrating coma, seizures, cardiac arrhythmias, hemodynamic instability, shock or hypotension, **SODIUM BICARBONATE** 1 mEq/kg IV over 2 minutes.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.410**
	TITLE: GUIDELINES FOR TRANSPORTING HIGHLY INFECTIOUS DISEASE PATIENTS REQUIRING BIO-CONTAINMENT DEVICE	**Effective Date 11/01/2021**

AdventHealth EMS Department may be required to transfer a highly infectious disease patient between facilities. To assure safety of all Healthcare providers, the public, and the patient, follow these guidelines.

- *Confirm the treatment the patient will need to receive during the transport including medications and ventilators.*
- *BLS patients do not require a cardiac monitor. All other patients will be classified as ALS and placed on a cardiac monitor.*

BLS CARE:

- *Criteria for BLS care:*
- All of the following must be present to meet criteria for BLS transport.
- Ambulatory
- GCS 15
- Saline lock with no IVF or medications.
- HR less than 100 BPM
- Blood Pressure greater than 100/45 mmHg or less than 140/90 mmHg
- O2 saturation greater than 92% on room air
- Respiratory rate greater than 12 or less than 22.
- Follow AdventHealth EMS Department training procedures for donning, doffing and disposal of all PPE equipment.

ALS CARE:

- **Pain Management:** First line therapy will be P.O. Use clinical judgment to administer pain medication as needed.
  - **ACETAMINOPHEN (TYLENOL)** 1000 mg P.O. x 1 dose
  - **OXYCODONE/ACETAMINOPHEN (PERCOCET)** 5/325 mg P.O. x 1 dose
  - **KETOROLAC (TORADOL)** 10 mg P.O. x 1 dose, not to be used with pregnant patients

- **Agitation/Anxiety:** Use both medications (**LORAZEPAM / HALOPERIDOL**) simultaneously as clinically indicated for agitation, anxiety, excitement, or impulsive behavior in non-pregnant patients.
    - **LORAZEPAM (ATIVAN)** 2 mg P.O. x 1 dose, not to be used with pregnant patients
    - **HALOPERIDOL (HALDOL)** 5 mg P.O. x 1 dose
    - **HYDOXYZINE (VISTARIL)** 50 mg P.O. x 1 dose, for use in pregnant patients only

- **Nausea/Vomiting:** Use as clinically indicated for nausea and vomiting.
    - **ONDANSETRON (ZOFRAN)** 4 mg SL for single dose only.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.411**
	TITLE: HYPERGLYCEMIA/ELEVATED GLUCOSE	**Effective Date 11/01/2021**

Classification of Transport: ALS

Signs and symptoms of hyperglycemia include but are not limited to: polyuria, polyphagia, polydipsia, tachycardia, orthostatic hypotension, rapid respirations, nausea/vomiting, fruity odor on breath, decreased mental status or coma.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Obtain glucose level.

ALS CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor.
- If Blood Glucose is greater than 400 mg/dL, **Normal Saline** 1000 mL bolus, recheck Blood Glucose in 20 minutes.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.412**
	TITLE: HYPERTENSIVE EMERGENCY/CRISIS	**Effective Date 11/01/2021**

Classification of Transport: ALS

A hypertensive emergency is defined as a life threatening elevation of blood pressure. Hypertensive emergencies may be characterized by, but not limited to: severe headaches, vomiting, visual disturbances, paralysis, seizures, coma, heart failure, and stroke. Hypertensive Emergency is characterized by Systolic Blood Pressure greater than 220 mm/Hg and diastolic blood pressure greater than 120 mm/Hg. End point of treatment for hypertensive emergency should be to lower the Diastolic Blood Pressure no more than 30% of its elevated value. Clinically monitor for signs of end organ failure. Signs of end organ failure include but are not limited to hypertensive encephalopathy characterized by paralysis, stroke like symptoms, seizures, coma, visual disturbances, and pulmonary edema.

BLS CARE:

- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

ALS CARE:

- IV via saline lock.
- Establish/Continue cardiac monitor.
- **LABETALOL** 10 mg IV push over 2 minutes, may repeat times 1 dose.
- If unable to obtain IV access, administer **NITROGLYCERIN** 0.4 mg sublingual every 5 minutes times 3 doses until IV access can be obtained. Monitor BP between administrations.
- Nausea per nausea/vomiting protocol. ***(159.415)***
- Headache per analgesia/pain management protocol. ***(159.405)***

CCT/FLIGHT CARE:

- Initiate **NICARDIPINE (CARDENE)** infusion at 5 mg/hr and titrate in increments of 1 to 2.5 mg/hr every 5 minutes for blood pressure control. When controlled, continue at that dose for maintenance. Max dose 15 mg/hr
- Once **NICARDIPINE (CARDENE)**is initiated do NOT use additional **LABETALOL** doses.

Rate Chart for NICARDIPINE 20 mg/200 mL or 25 mg/250 mL (0.1 mg/mL)

DOSE (mg/hr)	RATE (mL/hr)
2.5	25
5	50
7.5	75
10	100
12.5	125
15	150

Rate Chart for NICARDIPINE 40 mg/200 mL or 50 mg/250 mL (0.2 mg/mL)

DOSE (mg/hr)	RATE (mL/hr)
2.5	12.5
5	25
7.5	37.5
10	50
12.5	62.5
15	75

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.413**
	TITLE: HYPOGLYCEMIA	**Effective Date 11/01/2021**

Classification of Transport: ALS

Hypoglycemia can be due to inadequate glucose intake or increased glucose utilization. Stress and other factors can cause glucose to fall to critical levels. Signs and symptoms may include but are not limited to: weak rapid pulse, cold clammy skin, weakness, ataxia, headache, irritability, agitated/bizarre behavior or coma. Any patient who has a glucose level less than 70 mg/dL requires treatment (60 mg/dl if Pregnant).

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Perform blood glucose testing.
- If blood glucose is 70 mg/dL or less, without symptoms, and patient has no signs of difficulty swallowing, administer one tube of **ORAL GLUCOSE** gel.
- Recheck blood glucose after 20 minutes.

ALS CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor.
- **DEXTROSE 50%** 25 grams IV for glucose 50 - 70 mg/dL.
- **DEXTROSE 50%** 50 grams IV for glucose less than 50 mg/dL
- Re-evaluate after 15 minutes. If no change in hypoglycemic signs and symptoms, administer **DEXTROSE** 50% 25 grams IV.
- If no IV access, administer **GLUCAGON** 1 mg IM.
- If combative, see behavioral protocol ***(159.406)***.
- If no response, see altered mental status protocol ***(159.404)***.
- Recheck blood glucose 20 minutes after the administration of Dextrose 50%.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.414A**
	TITLE: INTRACEREBRAL HEMORRHAGE	**Effective Date 05/01/2022**

Classification of Transport: Flight/Critical Care

Intracerebral hemorrhage may be caused by a variety of events, which cause hemorrhage into surrounding brain tissue. Airway management, blood pressure control, and identification of current medications are of vital importance.

BLS CARE:

- BLS primary survey.
- Check blood glucose, see hypoglycemia protocol. ***(159.413)***
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Elevate head of bed 30 degrees. Evaluate whether C-Spine has been cleared if trauma present.

ALS CARE:

- If patient is having seizure activity then **LORAZEPAM** 0.1 mg/kg IV to maximum 8 mg.
- Advanced airway as needed (see advanced airway protocol). ***(159.201)***
- Obtain IV with saline lock.
- Establish/continue cardiac monitoring.
- Obtain 12 lead ECG.
- Blood pressure monitoring- maintain Systolic Blood Pressure 110-140 mm/Hg and Diastolic Blood Pressure less than 100 mm/Hg.
- **LABETALOL** 10 mg IV push over 2 minutes every 15 minutes to a maximum of 300 mg. Hold with HR less then 60.
- Pain control as per protocol 159.405.
- Nausea/vomiting per nausea/vomiting protocol 159.415.

CREDENTIALED CRITICAL CARE PROVIDER:

- Insertion of arterial line. Follow **SOP#250.502B** for Arterial Cannulation. If needed for patient comfort, 1%-2% Intradermal **LIDOCAINE** may be utilized. Please follow **SOP#250.962**. Arterial line insertion is clinically indicated for patients with, but not limited to: Systolic Blood Pressure less than 100 mm/Hg, MAP less than 65 mm/Hg, intubated patients requiring Blood Pressure support, sedation/analgesia, and mechanical ventilation.

- If intubated follow Analgesia- Sedation for Mechanically Ventilated Adults Protocol. ***(159.202)***

- **CARDENE** infusion start at 5 mg/hr. Increase 2.5 mg/hr every 5 minutes to a maximum of 15 mg/hr. Titration Goal: Keep SBP less than 140 mmHg and DBP less than 100 mmHg.
- If patient becomes hypotensive, **stop** infusions and initiate Shock protocol. ***(159.417)***

Rate Chart for niCARdipine 20 mg/200 mL or 25 mg/250 mL (0.1 mg/mL)

DOSE (mg/hr)	RATE (mL/hr)
2.5	25
5	50
7.5	75
10	100
12.5	125
15	150

Rate Chart for niCARdipine 40 mg/200 mL or 50 mg/250 mL (0.2 mg/mL)

DOSE (mg/hr)	RATE (mL/hr)
2.5	12.5
5	25
7.5	37.5
10	50
12.5	62.5
15	75

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.415**
	TITLE: NAUSEA/VOMITING	**Effective Date 11/01/2021**

Classification of Transport: ALS if medication is needed/given

Consider a differential diagnosis in all patients with new onset vomiting during transport. Assessment may include but not limited to signs of infection, distended abdomen, cardiac ischemia, increased intracranial pressure, and drug withdrawal.

BLS CARE:

- BLS primary survey.
- Keep patient in lateral recumbent or position of comfort.
- O2 per oxygen therapy protocol without compromising the airway ***(159.208)***
- Oral suctioning as needed.
- Obtain history of most recent dosage of antiemetic medication.

ALS CARE:

- Establish/Continue cardiac monitor, SpO2, EtCO2, NIBP.
- Assess 12 Lead ECG for STEMI Screening.
- IV access.
- Treat Pain as per Protocol ***(159.405)***.
- **ONDANSETRON** 8 mg slow IV, may repeat once, as needed, q15 minutes.
- **METOCLOPRAMIDE** 5 to 20 mg IVPB in 100mL NSS, infuse over 15 minutes.
- **DIPHENHYDRMINE** 1mg/kg up to 50mg IVP once, with **METOCLOPRAMIDE**.
- **LORAZEPAM** 1 to 2 mg IVP for Adults for refractory nausea and vomiting.
- Fluid administration to prevent dehydration.
- Normal Saline 500mL bolus IV, may repeat as necessary to total of 2000mL.
- Monitor patient for bradycardia secondary to vagal stimulation.

CCT/Flight Team:

Insert or continue/maintain Nasogastric tube on low intermittent suction. Do not place NGT with recent esophageal surgery, varices or recent gastric bypass/sleeve gastrectomy patients.

Contact Medical Direction as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.416**
	TITLE: SEIZURE	**Effective Date 11/01/2021**

Classification of Transport: ALS

Management of the airway and preventing the patient from injuring themselves are two important aspects of seizure treatment.

BLS CARE:

- BLS primary survey.
- Protect patient from injuring self.
- Place in left lateral recumbent, post seizure, if possible.
- Check blood glucose level. If less than 70 mg/dl see Hypoglycemia Protocol. ***(159.413)***
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Vomiting/aspiration precautions, suction as needed, and place nothing in mouth during seizure.

ALS CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor, SpO2, EtCO2, NIBP.
- If IV access established:
  - **LORAZEPAM** 0.1 mg/kg IV/IO push, max of 8mg for active seizure.

  OR if no IV Access:
  - **MIDAZOLAM** 0.2mg/kg IN/IM, max dose 10mg, Once
- Not to be administered during post-ictal state
- Once seizure has stopped re-check blood sugar.
  - If Blood Glucose less than 70 mg/dL see Protocol ***(159.413)***.
- Maintain body temperature.
- Treat arrhythmia as needed.

CCT/Flight:

- For prolonged seizure activity:
  - Add **KEPPRA** 50mg/kg IV, max of 4500mg
  - Add **FOSPHENYTOIN** 20mg PE/kg IV, Slow IV push (no more than 150mg/min)
- For Status Seizures, consider Rapid Sequence Intubation as per Protocol ***(159.215)***

Contact Medical Direction, as needed

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.417**
	TITLE: SHOCK	**Effective Date 11/01/2021**

Classification of Transport: ALS

Shock is defined as a clinical spectrum with the following signs and symptoms but not limited to altered mental status, clinically ill appearance, low blood pressure (systolic blood pressure less than 100 mm/Hg or MAP less than 65 mm/Hg), tachycardia (heart rate greater than 100 beats per minute), tachypnea, decreased urine output, and systemic acidosis.

Attempt to differentiate the type of shock and treat accordingly: hemorrhagic, hypovolemic, neurologic, cardiogenic, anaphylactic, and septic.

Early recognition and treatment of Shock is one of our primary goals in transport medicine. A single episode of hypotension can drastically effect morbidity.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Maintenance of proper body temperature.
- Place patient in supine position as clinically indicated and be prepared to suction as needed.
- Control active bleeding if present. See Protocol ***(159.708)***.
- Verify blood glucose level, if less than 70mg/dl treat per hypoglycemia protocol ***(159.413)***.
- Contact Medical Direction for additional help and support.

ALS CARE:

- Establish / continue ECG (12-lead if new onset of cardiogenic shock). ECG, SPO2, EtCO2, NIBP.
- Multiple IV access sites, if possible
- **HEMORRHAGIC/HYPOVOLEMIC/ANAPHYLATIC/SEPTIC/NEUROGENIC:**
  - Establish 2 IV lines if not done previously. Rapid infusion of **NORMAL SALINE** in 500 mL increments to maximum of 30 mL/Kg
  - Repeat after evaluation if still showing Systolic Blood Pressure less than 90 mmHg or MAP less than 65 mmHg consider starting vasopressors.
  - Vasopressors should be used after easily reversible causes have been treated and fluid resuscitation has failed.

- Push Dose Pressors such as Epinephrine or Phenylephrine should be first line followed by norepinephrine infusion as needed.
    - **EPINEPHRINE (1:100000, CONCENTRATION OF 10 MCG/ML)** Push 20mcg q 3-5 minutes as needed to increase SBP and MAP to the resuscitation goal of SBP 90mmHg or MAP 65.
    - **PHENYLEPHRINE (CONCENTRATION OF 100MCG/ML)** Push 200mcg q 3-5 minutes until resuscitation goal of SBP 90mmHg or MAP 65.
    - **NOREPINEPHRINE (CONCENTRATION OF 4 MG/250 ML, 16 MCG/ML)** Push 16mcg q 3-5 minutes until resuscitation goal of SBP 90mmHg or MAP 65.
- Push Dose Pressors are for resuscitation and then transition to an infusion of **NOREPINEPHRINE** to maintain resuscitation goals of SBP 90mmHg or MAP 65.
- Low Dose norepinephrine, phenylephrine or epinephrine can be given through a peripheral IV for a short duration.

Contact Medical Direction as needed

TABLE 5] Push-Dose Vasopressors in the ICU

Drug	Characterization/Dosing Strategy	Drug	Characterization/Dosing Strategy
Phenylephrine	Direct α-adrenergic agonist	Norepinephrine	Direct α- and β-adrenergic agonist
	Standard concentration:		Standard concentration:
	• 10 mg/250 mL = 40 μg/mL *or*		• 4 mg/250 mL = 16 μg/mL *or*
	• 10 mg/100 mL = 100 μg/mL		• 16 mg/250 mL = 64 μg/mL
	40-200 μg IVPB every 1-5 min		8-16 μg IVPB every 1-5 min
Ephedrine	Indirect stimulation of adrenergic system via endogenous catecholamine release with α and β activity	Epinephrine	Direct α- and β-adrenergic agonist
	Standard concentration: 50 mg/ 10 mL		Standard concentrations: 1 mg in 100 mL = 10 μg/mL, 4 mg/250 mL = 16 μg/mL, or 16 mg/250 mL = 64 μg/mL
	5-10 mg IVPB every 1-5 min		10-20 μg IVPB every 1-5 min

Caution and knowledge of concentration of vasopressors is of the utmost importance given the potential for medication administration errors with multiple common dilutions. IVPB = intravenous push bolus.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.418B**
	TITLE: CARDIOGENIC SHOCK	**Effective Date 05/01/2022**

Classification of Transport: ALS

Cardiogenic Shock is defined as a clinical spectrum with the following signs and symptoms but not limited to altered mental status, clinically ill appearance, low blood pressure (systolic blood pressure less than 100 mm/Hg or MAP less than 65 mm/Hg), tachycardia, heart rate greater than 100 beats per minute, tachypnea, decreased urine output, and systemic acidosis.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Maintenance of proper body temperature.
- Place patient in 30 degree head elevation position for airway management, as clinically indicated and be prepared to suction as needed.

ALS CARE:

- Establish/continue ECG monitoring (12-lead if new onset of cardiogenic shock).
- 500mL **NORMAL SALINE INFUSION** to maximum of 1000mL. Monitor for signs of acute pulmonary edema. Consider CPAP or BiPAP as needed.
- If Systolic Blood Pressure remains less than 90 mm/Hg or MAP less than 65 mm/Hg, initiate:

  NOREPINEPHRINE INFUSION Start at 0.05 mcg/kg/minute. Titrate every 5 minutes to maintain Systolic Blood Pressure greater than 90 mmHg or MAP greater than 65. Maximum reference dose is 3.3 mcg/kg/minute.

  Add **DOBUTAMINE** if unable to reach resuscitation goals or worsening CHF:

  DOBUTAMINE INFUSION Start 2-20 mcg/kg/min. Titrate every 5 minutes Infusion to resuscitation goals of SBP of 90 mmHg or MAP 65.

CREDENTIALED CRITICAL CARE PROVIDER:

- Follow **SOP#250.502B** for Arterial Cannulation. If needed for patient comfort, 1%-2% Intradermal **LIDOCAINE** may be utilized. Please follow **SOP#250.962**.

Arterial line insertion is indicated for systolic blood pressure less than 90mm/Hg or hemodynamically unstable as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.419A**
	TITLE: STROKE/CEREBRAL VASCULAR ACCIDENT-WITHOUT TPA ADMINISTRATION	**Effective Date 11/1/2022**

Classification of Transport: ALS

Stroke patients may have a change in condition during transport.
Identify signs of stroke which include but are not limited to sudden weakness or numbness of the face, arm or leg, especially on one side of the body, sudden confusion, trouble speaking or understanding, sudden trouble seeing in one or both eyes, sudden trouble walking, dizziness or loss of balance or coordination, sudden severe headache with no known cause.

Support airway, breathing and circulation via appropriate protocols, BLS primary survey, and ACLS secondary survey. Once symptoms and signs identified the time of onset is the next most important factor.

BLS CARE:

- Identify signs and symptoms of stroke.
- Perform primary BLS survey.
- Perform **NIHSS** exam in TabletPCR and record value (If not previously done and time allows).
- Obtain blood glucose level.
- Provide **OXYGEN** per oxygen therapy protocol ***(159.208)***.

ALS CARE:

- IV access.
- Establish/continue cardiac monitor.
- Maintain Systolic Blood Pressure below 180 mmHg
- **LABETALOL** 10 mg IV over 2 minutes, may repeat dose in 10 minutes if no change in BP. Only for use in patients with heart rate greater than 60 bpm.
- Lower SBP no more than 30% of initial value if no order given by sending or receiving physician.
- 12 lead ECG.
- Review history for fibrinolytic exclusion (see fibrinolytic exclusion protocol)
- Elevate head of bed 30 degrees.
- Notify accepting unit via dispatch of change in neurologic condition and results of neurologic assessment.
- If seizure activity present, see seizure protocol. ***(159.416)***
- If Increased ICP or Cerebral Edema suspected call Medical Control, consider **3% HYPERTONIC SALINE** IV Bolus 1 to 5 mL/kg, over 20 minutes, max 250 mL. **(159.853)**

CCT/FLIGHT CARE:

- Add **CARDENE** if Systolic Blood Pressure greater than 180 mm/Hg and persistently elevated after 4 doses of Labetalol.

  CARDENE 25 mg/250ml Normal Saline, start at 5 mg/hr and titrate by 2.5mg/hr every 5 min up to a max 15mg/hr. Systolic Blood Pressure goal of 160-180 mm/Hg, unless otherwise specified.

- Or **NITROPRUSSIDE**; Discontinue **CARDENE** drip when starting **NITROPRUSSIDE**.

  NITROPRUSSIDE 50mg/250mL D5W, 0.2 mcg/kg/min IV infusion. Titrate to effect by increasing in 0.25 mcg/kg/min every 5 minimum to maximum of 10 mcg/kg/min. Systolic Blood Pressure goal of 160-180 mm/Hg, unless otherwise specified.

- It is a rare occurrence that the *initiation* of **CARDENE** or **NITROPRUSSIDE** will be required during a transport. The more likely scenario would be continuation of these medications with blood pressure recommendations from the sending or receiving physician.
- Invasive Blood pressure monitoring should be initiated with an A-Line, as per protocol, when Vasoactive infusions are being started or continued during transports for neurological patients.

Contacted Medical Direction as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.420**
	TITLE: STROKE/CEREBRAL VASCULAR ACCIDENT-POST r-tPA ADMINISTRATION	**Effective Date 11/01/2021**

Classification of Transport: CCT/Flight

Any changes in patient's mental status, post r-tPA administration, should have a high index of suspicion for inter-cerebral hemorrhage. Support airway, breathing and circulation via appropriate protocols, BLS primary survey, and ACLS secondary survey. Once symptoms and signs identified the time of onset is the next most important factor.

Contact destination facility for a rapid response or notification to the ICU team, immediate CT imaging will be required after initial stabilization/resuscitation. Continue transport as planned, unless otherwise directed.

- Care is identical to previous Stroke Protocol, ***(159.419).***
- Assess and manage the elements of patient's primary survey.
- Supportive care as detailed in previous protocols.
- Document time and extent of new symptoms.
- Notify receiving facility and unit of the changes in the patient's condition.
- Contact Medical Direction, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.421A**
	TITLE: THORACIC ANEURYSM	**Effective Date 11/01/2022**

Classification of Transport: ALS

Sudden onset, severe chest pain with or without radiation to upper back. Described as tearing by some patients. Palpate for equal pulses in the upper and lower extremities. Monitor blood pressure in both upper extremities.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Monitor SpO2

ALS CARE:

- IV access with saline lock.
- Establish/Continue cardiac monitor.
- Maintain VS as per parameters given in hand off report, if not detailed:
  - It is important to control the heart rate, maintain less than 80 bpm.
  - Goal of blood pressure therapy is to maintain Systolic Blood Pressure 110 mm/Hg and Diastolic Blood Pressure less than 90 mm/Hg.
- **METOPROLOL** 5 mg IV every 5 minutes times 3 doses (max. dose 15mg) for heart rate greater than 80 bpm, maintain Systolic Blood Pressure less than 110 mm/Hg and Diastolic Blood Pressure less than 90 mm/Hg.

CCT/FLIGHT CARE:

- **ESMOLOL BOLUS** of 500 mcg/kg IV Push once, then initiate **ESMOLOL INFUSION** at 50 mcg/kg/min. Increase **ESMOLOL INFUSION** by 50 mcg/kg/min every 5 minutes. Max 200 mcg/kg/min.

  AND

  NITROPRUSSIDE INFUSION 50mg/250mL D5W, 0.2mcg/kg/min IV infusion. Titrate to effect by increasing in 0.25mcg/kg/min every 5 minimum to maximum of 10 mcg/kg/min. Systolic Blood Pressure goal of 100-110 mm/Hg, unless otherwise specified.

Patient should have an invasive blood pressure monitor to guide therapy, such as an A-Line as per Protocol, with Critical Care Vasoactive Infusions.

Contact Medical Control, as needed

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.422**
	TITLE: Special Event Medicine	**Effective Date 3/28/2022**

Special Event Medicine:

Special Event Medicine is unique to EM/EMS whereas there are many more patients then resources available, essentially a Mass Causality Incident (MCI). The ideal goal is to accurately triage and treat patients on site and reserve transport off site for the acutely ill/injured patients with needs exceeding the onsite resources.

To that extent, Onsite Medical Teams will have expanded treatment capabilities to include the following medications for specific complaints. Each patient contact will require at least a brief assessment documented on the "Special Event Run Sheet". Data required is Patient's Name, DOB, Event Location, DOS, Vital Signs, Allergies and the Medication given for a specific complaint.

As with any medication administration, standard practices must be followed, such as: Right Patient, Right Medication, Right Dose, Right Route, Right Time, Right Documentation.

BLS CARE:

- **Ondansetron (Zofran) Oral Disintegrating Tablet (ODT)**:
  - Adult Dose is **Zofran 8mg ODT** for acute nausea/vomiting x 1 dose.
  - Pediatric Dose is **Zofran 4mg ODT** for acute nausea/vomiting x 1 dose; patients 30-60 kg.
    - Patients greater the 60kg administer **Zofran 8mg ODT** once.
    - Patients less than 30kg must be evaluated by onsite medical team.
  - If one dose is not sufficient, further, formal evaluation by onsite Medical Team is required.

- **Acetaminophen (Tylenol) Tablets or Capsules:**
  - Adult Dose is **Tylenol 1000mg PO** for acute pain or fever x 1 dose.
  - Pediatric Dose is **Tylenol 500mg PO** for acute pain or fever x 1 dose; patients 30-60kg.
    - Patients greater the 60kg administer **Tylenol 1000 mg PO** once.
    - Patients less than 30kg must be evaluated by onsite medical team.
  - If one dose is not sufficient, further, formal evaluation by onsite Medical Team is required.

- **Ibuprofen (Motrin) Tablets or Capsules:**
  - Adult Dose is **Motrin 600mg PO** for acute pain or fever x 1 dose.
  - Pediatric Dose is:
    - **Motrin 400mg PO** for acute pain or fever x 1 dose; patients 40-60kg.
    - **Motrin 200mg PO** for acute pain or fever x 1 dose; patients 20-40kg.

    - Patients less 20kg must be evaluated by onsite medical team.
  - If one dose is not sufficient, further, formal evaluation by onsite Medical Team is required.

- **Diphenhydramine (Benadryl) Tablets or Capsules:**
  - Adult Dose is **Benadryl 50mg PO** for acute pruritus (itching) x 1 dose.
  - Pediatric Dose is **Benadryl 25mg PO** for acute pruritus (itching) x 1 dose; patients 30-60kg.
    - Patients greater the 60kg administer **Benadryl 50mg PO** once.
    - Patients less than 30kg must be evaluated by onsite medical team.
  - If one dose is not sufficient, further, formal evaluation by onsite Medical Team is required.

- **Loperamide (Imodium) Tablets or Capsules:**
  - Adult Dose is **Imodium 4mg PO** for acute diarrhea x 1 dose.
  - Pediatric Dose is **Imodium 2mg PO** for acute diarrhea x 1 dose; patients 30-60kg.
    - Patients greater the 60kg administer **Imodium 4mg PO** once.
    - Patients less than 30kg must be evaluated by onsite medical team.
  - If one dose is not sufficient, further, formal evaluation by onsite Medical Team is required.

- **Epinephrine (Adrenaline) Autoinjector or Manual Syringe Injection**:
  - Adult Dose is **Epinephrine 0.3 mg IM** for Anaphylaxis x 1 dose.
  - Pediatric Dose is **Epinephrine 0.15 mg IM** for Anaphylaxis x 1 dose; patients 15-30kg.
    - Patients greater the 30kg administer **Epinephrine 0.3mg IM** once.
    - Patients less than 15kg must be evaluated by onsite medical team.
  - All Patients receiving Epinephrine for anaphylaxis must be seen by the onsite medical team for a formal evaluation.
  - If a delay occurs more than 10 minutes and the patient's symptoms of anaphylaxis persist or worsen, repeat the same dose of Epinephrine.

Contact On-Site supervisor or EMS Medical Director as needed.

Classification of Transport: Flight/Critical Care

PLACENTA PREVIA:

- Abnormal implantation of the placenta into the lower uterine segment.

Symptoms: Painless, bright red uterine bleeding during the second or third trimester. May be intermittent or continuous. After bleeding episode, the patient may have bright red spotting or dark brown blood present.

ABRUPTIO PLACENTA:

- Premature detachment of, part or all of the, placenta from the implantation site, typically occurring after the 20th week of pregnancy.

Symptoms: Sudden onset, intense, localized uterine pain with or without vaginal bleeding. Visible blood loss may not be proportional to the area of detachment as blood may become trapped behind the placenta. Marginal separations are often accompanied by bright red bleeding with frequent contractions. Expect rapid labor progression.

UTERINE RUPTURE:

- Catastrophic event for the mother and fetus. Uterine rupture refers to separation of the uterine myometrium with rupture of membranes and extrusion of fetal parts into the peritoneal cavity.

Symptoms: Depends on the type of rupture. Severe sudden continual abdominal pain and signs of hypovolemic shock. May not present with hypotension until significant blood loss has occurred. Also may be able to palpate fetal body parts and uterine integrity is lost.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.502**
	TITLE: GENERAL OB TRANSPORT	**Effective Date 11/01/2021**

Classification of Transport: ALS

The transport of the pregnant patient poses unique physiologic challenges. It should be noted that the pregnant patient demonstrates increased heart rate, increased respiratory rate, lower BP, and decreased blood volume. If pre-eclampsia, preterm labor, vaginal bleeding or an emergency childbirth situation exists refer to that specific protocol.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Assess the patient for signs of imminent delivery.
    - Number of previous deliveries.
    - Contractions less than two minutes apart, lasting 30-45 seconds.
    - Crowning or bulging.
    - Mother feels a need to move bowels.
- If the delivery does not appear imminent, position and transport the patient in the left lateral recumbent position.
- Obtain approximate gestational age of fetus.
- Document last recorded fetal heart tones.
- Monitor patient for contractions and if present document duration and frequency.

ALS CARE:

- Obtain IV access, when clinically indicated.
- Establish/Continue cardiac monitor.
- Place patient in left lateral recumbent position.
- Be prepared with OB kit in case of premature birth.

Classification of Transport: ALS

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Reassess the patient frequently.
- If delivery is imminent, prepare for delivery.
  - Place drapes over mother's abdomen and beneath perineum.
  - Prepare bulb syringe, cord clamps and blue under pads to receive infant.
  - Utilize body substance isolation practices.
  - Control the delivery.
  - Support the head during the delivery.
  - Suction the mouth, then nose, after delivery of the head.
  - Remove cord from around the neck if clinically indicated.
  - Gently guide the head downward until the upper shoulder delivers.
  - Gently guide the head upward until the other shoulder delivers.
  - Keep the newborn at perineum level until the infant is completely delivered.
  - The cord is clamped at 8 and 10 inches from the newborn and cut between the clamps.
  - Care for the newborn; see Care of the Newborn, Post Delivery Protocol. ***(159.605)***
  - Record the time of the birth.
  - Record **APGAR** score at 1 and 5 minutes.
- Placenta should deliver in 20 - 30 minutes. If delivered, collect in plastic bag. Do not pull on cord to facilitate delivery of the placenta.

Classification of Transport: ALS

BREECH BIRTH:

- Footling Breech, which is one or both feet delivered first
- Frank Breech, which is the buttocks first presentation
- Feet first become visible, there is normally time to transport patient to nearest facility.
- If upper thighs or the buttock have come out of the vagina, delivery is imminent.
- If the child's body has delivered and the head appears caught in the vagina, the Provider must support the child's body and insert two sterile gloved fingers into the vagina along the child's neck until the chin is located. At this point, the two fingers should be placed between the chin and the vaginal canal and then advanced past the mouth and nose.
- After achieving this position, a passage for air must be created by pushing the vaginal canal away from the child's face. This air passage must be maintained until the child is completely delivered.

PROLAPSED CORD:

- Elevate mother's hips.
- Place sterile gloved hand into vagina between pubic bone and presenting part with cord between two fingers to monitor cord pulsations and exert counter-pressure on presenting part.
- Cover exposed cord with moist dressing and keep warm.

ALS CARE:

- If Systolic Blood Pressure is less than 100 mmHg or MAP less than 65 mmHg, establish an IV of Normal Saline 500mL. bolus, repeat as needed, see shock protocol as needed. ***(159.417)***

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.504**
	TITLE: MATERNAL COMPLICATIONS OF LABOR AND DELIVERY	**Effective Date 11/01/2021**

Classification of Transport: ALS

Maternal complications of labor and delivery include the following but are not limited to: post-partum hemorrhage, uterine rupture, and uterine inversion

BASIC CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

ADVANCED CARE:

- Obtain IV access and begin to administer **Normal Saline** 500 mL bolus IV and reassess.
- Repeat **Normal Saline** 500 mL bolus if Systolic Blood Pressure less than 100 mmHg or MAP less than 65 mmHg.
- Establish/Continue cardiac monitor.
- Perform gentle fundal massage.
- Do not force delivery of placenta or place anything in vaginal canal to prevent bleeding.
- In case of uterine inversion, cover the uterus with moistened towels.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.505**
	TITLE: PREECLAMPSIA/ECLAMPSIA	**Effective Date 08/01/2020**

Classification of Transport: ALS

Preeclampsia is a spectrum of clinical signs and symptoms including but not limited to hypertension, proteinuria, and edema. Other signs and symptoms include headache, visual disturbance, hyperactive reflexes, pulmonary edema, and decreased urine output. Eclampsia is the development of seizures or coma. Seizures are usually preceded by visual disturbances, spots before the eyes or flashing lights. Patients who are eclamptic may display clinically as grossly edematous and have markedly elevated blood pressure.

BLS CARE:

- All pre-eclamptic patients are to be transported non-emergent to minimize stimulation that could precipitate seizures, anxiety, or elevated BP.
- BLS primary survey.
- Obtain history regarding weight gain, headaches, visual problems, right upper gastric pain, and seizures.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***

ALS CARE:

- Monitor airway per advanced airway protocol ***(159.201)***
- Establish/Continue cardiac monitor
- Obtain IV access
- Seizure precautions
- Assess blood pressure in left lateral recumbent position.
- If blood pressure greater than or equal to 160/110 mmHg begin antihypertensive.
- **LABETALOL** 20 mg IV slow push over 2 minutes and reassess blood pressure in 10 minutes.
- If Systolic Blood Pressure remains greater than 160 mmHg then **LABETALOL** 40mg IV slow push over 2 minutes.
- If seizure develops or seizures are imminent, administer **MAGNESIUM SULFATE**. **MAGNESIUM SULFATE** 4 grams in 100 mL of normal saline run over 20 minutes. Followed by a maintenance infusion of 2 grams in 100 mL Normal Saline over 1 hour.
- If seizures persist despite **MAGNESIUM SULFATE** administration, follow seizure protocol ***(159.416)***.
- Monitor patient on **MAGNESIUM SULFATE** for side effects and toxicity. If patient develops loss of deep tendon reflexes, respiratory compromise

including signs of impending respiratory failure or cardiac arrest, **CALCIUM GLUCONATE** is to be administered. **CALCIUM GLUCONATE** is 10% 1gram / 10 mL IV over 5 minutes slow IV push. **CALCIUM CHLORIDE** 1g IV/IO push is also acceptable for an overdose of **MAGNESIUM SULFATE**.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.506**
	TITLE: PRETERM LABOR	**Effective Date 11/01/2021**

Classification of Transport: ALS

Preterm labor is defined as labor occurring before 36 weeks gestation. Presentation may be difficult to recognize by both patient and health care provider. Signs and symptoms include but are not limited to contractions occurring greater than or equal to every 6-8 every hour, dull low back pain, intermittent pressure, lower abdominal pain, intestinal discomfort with or without cramping. Rupture of membranes is confirmatory for preterm labor.

BASIC CARE:

- BLS primary survey.
- Determine gestational age of the fetus.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Transport in left lateral recumbent position.
- Monitor patient for contractions and if present document duration, frequency and last known fetal heart tones.

ADVANCED CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor.
- Be prepared with OB kit in case of premature birth.

Classification of Transport: ALS

Patients of greater than 20 weeks gestation should be placed in left lateral tilt position to allow uterus to lie off the inferior vena cava. Pregnant patients are hypervolemic and may experience a 30% loss of blood before the development of signs and symptoms of hypovolemia develop.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Assess vital signs.
- Assess cervical spine and place spinal precautions as clinically indicated.
- Perform OB assessment.

ALS CARE:

- Obtain IV access.
- Cardiac monitor and assess for adequate signs of circulating blood volume and signs of shock.
- Assess uterine size using fundal height.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.508**
	TITLE: VAGINAL BLEEDING	**Effective Date 11/01/2021**

Classification of Transport: ALS

Bleeding during pregnancy is worrisome and may be a sign of serious pregnancy related complication. Management depends on gestational age and clinical presentation.

BASIC CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.208)***
- Perform OB assessment.

ADVANCED CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor.
- Place patient in left lateral recumbent position.
- Monitor for signs of shock. If shock present, give **Normal Saline** 500 mL IV bolus, and reassess patient, see Shock protocol (***159.417***).
- Retain any clots or tissue and present to accepting physician.
- Provide emotional support to mother/parents, as this is a potentially devastating psychological experience.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.601**
	TITLE: ABDOMINAL PAIN - PEDIATRIC	**Effective Date 11/1/2021**

Classification of Transport: ALS

Abdominal pain assessment and management should contain time of onset. Describe if it is intermittent or constant, and specific location. Back pain and flank pain should be included in the assessment. Look for a discrepancy in upper extremity blood pressures. Goal of the transport team is to control pain, nausea and vomiting during the trip. Assess for signs and symptoms of a worsening condition, hypotension, shock, tachycardia, tachypnea or sepsis. Report any significant change to Medical Direction or the receiving team.

BLS CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol ***(159.614).***

ALS CARE:

- Obtain IV access, if clinically indicated, such as requires IV infusions, IV Fluid resuscitation, IV medications for pain, nausea or vomiting.
- Establish/Continue cardiac monitor, SpO2, NIBP, EtCO2.
- 20 ml/kg Normal Saline bolus for dehydration times 1 dose only.
- Control Pain as per Protocol ***(159.604)***
- Control Nausea and Vomiting as per Protocol ***(159.613)***

Contact Medical Direction, as needed

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.602**
	TITLE: ADVANCED AIRWAY– PEDIATRICS	**Effective Date 11/01/2021**

Classification of Transport: ALS

Any patient demonstrating the following clinical signs and symptoms including but not limited to should be assessed for: imminent respiratory failure, bradypnea, periodic apnea, decreasing heart rate including bradycardia, diminished air movement, low oxygen saturation, stupor, coma, poor skeletal muscle tone, and cyanosis.

BLS CARE:

- BLS primary survey
- **OXYGEN** administration per oxygen therapy protocol ***(159.614)***
- Bag valve mask administration to maintain patient SpO_2 above 94%.

ALS CARE:

- If no improvement after Basic interventions, supplemental oxygen administration, attempts to resolve rapidly reversible causes of respiratory failure (ie hypoglycemia, hypoxia, shock, etc), consider intubation as per Protocol ***(159.612)***.
- Indications for Intubation is:
  - Failure to maintain an open Airway
  - Failure to oxygenate
  - Failure to ventilate
  - Anticipated clinical course of losing their airway, such as in an evolving airway burn, anaphylaxis or traumatic injury

- If the patient is completely unresponsive, attempt endotracheal intubation. If not successful, and still unresponsive, may attempt again for a total of 2 attempts.
  - If successful, place on ventilator per ventilator protocol and secure tube. Be prepared for an acute increase in the level of consciousness and plan for sedation as per protocol ***(159.612)***, Post intubation sedation.
  - Utilize continuous SpO_2 and waveform $EtCO_2$ monitoring for all intubated patients.
- If endotracheal intubation unsuccessful continue bag valve mask and maintain SpO_2 above 94%. Consider placement of Supraglottic Airway (SGA)
- If at anytime a can't intubate and can't ventilate (CICV) situation arises follow protocol ***(159.615)***.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.603**
	TITLE: ALLERGIC REACTION/ANAPHYLAXIS – PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Patients with an acute allergic reaction/anaphylaxis may demonstrate the following signs and symptoms but are not limited to: hives, itching, wheezing, shortness of breath, chest tightness, stridor, shock, or severe respiratory distress.

BASIC CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol ***(159.614).***
- NPO.

ADVANCED CARE:

- Obtain IV access.
- Establish/continue cardiac monitor, SpO2, NIBP, EtCO2.
- **BENADRYL** 1 mg/kg I push or IM maximum dose of 50 mg.
- **METHYLPREDNISOLONE** 2 mg/kg IV push or IM maximum dose is 125 mg.
- **FAMOTIDINE** 0.5 mg/kg IV infusion over 10-20 minutes (no faster than 10 mg/min) (total amount of medication in 10 mL Normal Saline) maximum dose 20 mg.

Allergic Reaction with airway compromise or dyspnea/wheeze/stridor, angioedema, systemic signs of anaphylaxis, hypotension defined per chart below, shortness of breath, and/or diminished breath sounds.

- Above treatment plus:
- **EPINEPHRINE 1 mg/ml**; 0.01 mg/kg IM, maximum dose 0.5 mg. May repeat every 3- 5 minutes for a total of 3 doses.
- **ALBUTEROL** 2.5 mg in 3 mL Normal Saline via nebulizer with **IPRATROPIUM BROMIDE** 0.5 mg. Repeat every 20 minutes as necessary for wheezing/shortness of breath, up to 3 doses. May add continuous **ALBUTEROL** nebulizer treatments at 1 mg/kg/hr or max of 20 mg/hr after **DUONEB** treatment.
- **NS** bolus 20 mL/Kg for hypotension, May repeat for a total of 2000 mL.
- Consider **EPINEPHRINE INFUSION 0.1 to 0.5 mcg/kg/min:**
  - Patient weight <5kg use concentration of 4 mcg/ml (1mg in 250mL=4 mcg/mL)
  - Patient weight > or = to 5kg use 16 mcg/mL (4mg in 250mL=16 mcg/mL)
- Consider Advanced Airway as needed.

Contact Medical Direction, as needed.

FIGURE1:

Normal Blood Pressure by Age (mm Hg) Reference: PALS Guidelines, 2015			
Age	Systolic Pressure	Diastolic Pressure	Systolic Hypotension
Birth (12 h, <1000 g)	39-59	16-36	<40-50
Birth (12 h, 3 kg)	60-76	31-45	<50
Neonate (96 h)	67-84	35-53	<60
Infant (1-12 mo)	72-104	37-56	<70
Toddler (1-2 y)	86-106	42-63	<70 + (age in years x 2)
Preschooler (3-5 y)	89-112	46-72	<70 + (age in years x 2)
School-age (6-9 y)	97-115	57-76	<70 + (age in years x 2)
Preadolescent (10-11 y)	102-120	61-80	<90
Adolescent (12-15 y)	110-131	64-83	<90

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.604**
	TITLE: ANALGESIA/PAIN MANAGEMENT - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Any patient who receives any narcotic will have an assessment done at the very minimum every 10 minutes per AdventHealth narcotic protocol. Pt assessment shall include RASS score, respiratory rate, pulse rate, SpO_2 and blood pressure. Upon delivery of patient to accepting unit, the accepting nurse shall be informed of type of narcotic administered, dose, route, time of administration, and update on assessment since receiving narcotic. If, as a result of narcotic administration, patient experiences any respiratory depression or criteria for intubation, follow oxygen therapy protocol, and/or advanced airway protocol if necessary. All of above shall be documented in the narrative and / or scores portion of the electronic medical record.

BLS CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol ***(159.614)***
- Position of conform while maintaining appropriate vehicle safety restraints (Seat belts)

ALS CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor, SpO2, NISP, EtCO2 monitoring.
    - Infants less than 6 months:
        - Encourage **ACETAMINOPHEN 15 mg/kg PO/PR**, if possible prior to transport, if clinically appropriate.
        - **KETOROLAC** 0.5 mg/kg IVP q 6 hours, as needed for pain
        - **MORPHINE** 0.05 mg/kg IV Slow Push, as needed for pain. May repeat q 30 minutes for unresolved pain for a total of 1 mg/kg.
    - Infants less than 6 months are at high risk for apnea after narcotic administration.
    - Children 6 months and greater:
        - **ACETAMINOPHEN 15 MG/KG** PO/PR
        - **KETOROLAC** 0.5 mg/kg IVP q 6 hours, as needed, max 30mg.
        - **MORPHINE** 0.1mg/kg IV Slow Push, as needed for pain. May repeat q 30 minutes for unresolved pain for a total of 1 mg/kg.
- All patients who receive narcotics within the previous 60 minutes shall have constant EtCO2 monitoring.
- All patients who receive narcotics during transport shall have constant EtCO2 monitoring.

- Patients who are hemodynamically unstable, allergic to opiates including morphine, or have received **NARCAN** in past 24 hours, shall not receive any narcotics. Use of the analgesia/pain management protocol is for patients experiencing pain associated with isolated extremity injuries, hip injuries, sickle cell crisis patients, chest pain, headache, abdominal pain, or any specific pathology that patient is being transported to a higher level of care for evaluation
- After every administration of narcotic, a documented note must include RASS score, reassess pain scale, oxygenation, ventilation of patient, EtCO2, and vital signs.
- Treat Nausea/vomiting as per Protocol ***(159.613)***
- Add **DIPHENHYDRAMINE** 1mg/kg up to 50mg IVP as needed for itching.

RICHMOND AGITATED SEDATION SCALE

Score	Term	Description
+4	Combative	Overtly combative or violent and an immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert but has sustained (> 10 seconds) awakenings, with eye contact, to voice
-2	Light sedation	Briefly (< 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimuli
-5	Unarousable	No response to voice or physical stimulation

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.605**
	TITLE: ASYSTOLE/PEA- PEDIATRIC	**Effective Date 11/01/2021**

Asystole is the state of total cessation of electrical activity from the heart. PEA is cardiac electrical activity without a palpable pulse.

Classification of Transport: ALS

BLS CARE:

- BLS primary survey
- Immediately initiate help for additional resources.
- Conduct primary assessment
- Establish and maintain airway, provide oxygen and support ventilations.
- Begin CPR per AHA guidelines
    - Push hard and fast (at least 100-120/min)
    - Compress at least 1/3 depth of chest
    - Ensure full chest recoil
    - Minimize interruptions in chest compressions
- Initiate cardiopulmonary resuscitation (CPR) at a rate of 30 compressions to 2 ventilations (1 rescuer) or 15 compressions to 2 ventilations (2 rescuers).

ALS CARE:

- Above measures, continue CPR.
- Refer to Color Coded Length Based Resuscitation Tape (Commonly referred to as Broslow Tape) for equipment and medication dosages.
- Establish airway per Pediatric Advanced Airway Protocol ***(159.602)***
- Cardiac monitor- confirm asystole in two contiguous leads.
- **EPINEPHRINE 0.1MG/ML;** 0.01 mg/kg IV/IO push; **EPINEPHRINE 1 MG/ML;** 0.1 mg/kg ETT if no IV/IO available. Repeat every 3-5 minutes.
- Medication administration during CPR.
- Check rhythm, if shockable see appropriate ADHEMS protocol.
- If not shockable, continue CPR.
- Evaluate and when possible, treat for suspected causes of cardiac arrest:
    - Hypoxia
    - Hypovolemia
    - Hydrogen ion (acidosis)
    - Hypothermia
    - Hypoglycemia
    - Hyperkalemia/Hypokalemia

- Toxins/Tablets (drug overdose)
- Thrombosis – heart (AMI)
- Tension pneumothorax
- Tamponade (cardiac)
- Thrombosis – lungs (PE)

- Continue cycles of CPR per PALS guidelines.
- CPR for two minutes then rhythm check. Rotate compressors every cycle or sooner if fatigued.
- Shock if clinically indicated.
- Immediately resume CPR, give necessary medications while CPR is in progress.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.606**
	TITLE: BEHAVORIAL AND PSYCHOLOGICAL EMERGENCIES - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Approach every patient cautiously to protect yourself and your crew from injury. Be suspicious of life-threatening emergencies. Remove anyone who agitates the patient or adds confusion at the scene.

BLS CARE:

- Listen to patient.
- Ask open-ended questions.
- Do not rush patient history.
- Communicate honestly and with professionalism.
- Do not threaten patient in any way.
- Keep a safe distance.
- Avoid appearing judgmental.
- Never lie to a patient.

ALS CARE:

Psychosis - a severe mental disorder in which thought and emotions are so impaired that contact is lost with external reality.

Agitation/Anxiety- a state of excessive psychomotor activity accompanied by increased tension and irritability.

- Perform a mental status exam.
    - General appearance, behavioral observations, orientation, memory, sensorium, perceptual process, mood, and affect, intelligence, thought process, insight, judgment, and psychomotor.

Psychosis:

- **GEODON** 0.2 mg/kg up to max. dose of 10 mg IM times one dose only. ***(5 years of Age or greater only)***. Contraindicated if patient has received Geodon within last 24 hours.

Agitation/Anxiety:

- **HALDOL** 0.05 mg/kg IM / IN, one dose only to maximum dose 10 mg.
- **LORAZEPAM** 0.05 mg/kg IM / IN / IV, may repeat in 5 minutes to maximum dose 4 mg.
- All patients post administration, **GEODON, HALDOL**, and/or **LORAZEPAM**, shall receive cardiac monitor, EtCO2, and SpO2.
- Four point restraints: see Behavioral Restraints – Pediatric policy. ***(159.607)***

Severe Uncontrolled Agitation, i.e., excited delirium:

In severely agitated patients whose agitation poses an immediate threat to themselves or others. The immediate priority is to stop the uncontrolled agitation and stop the immediate risk of harming themselves or others. Patient and Crew Safety is the priority.

Call for Help from Security or Police as needed.

- **KETAMINE** 1 mg/kg IV or 4mg/kg IM maximum dose 500mg. Deltoid or lateral thigh for IM injection sites. **(For Patients Greater than *12 years of Age only)***.

- After administration of **KETAMINE** monitor the airway, ECG, NIBP, SpO2, and waveform EtCO2. See airway management protocol **(159.602)**.

These cases can be very high profile with high amount of risk

Contact Medical Direction when situation allows if **KETAMINE** is administered.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.607**
	TITLE: BEHAVIORAL RESTRAINTS - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Restraint or seclusion may only be imposed to ensure the immediate and physical safety of the patient, a staff member, or others and must be discontinued at the earliest possible time. All patients have the right to be free from physical or mental abuse, and corporal punishment. All patients have the right to be free from restraint or seclusion of any form, imposed as a means of coercion, discipline, convenience, or retaliation by staff.

- Justification for behavioral restrains include, but are not limited to:
  - Threatening or attempting to physically harm others
  - Threatening or attempting to harm self
  - Agitated/potentially explosive and unable to redirect after repeated attempts
  - Violent and aggressive behavior
  - Removing medical equipment
  - Unable to follow directions
  - Interfering with medical treatment

- Prior to the initiation of restraints:
  - See behavioral and psychological emergencies protocol
  - Address cause of patients behavior
  - Attempt to redirect inappropriate behavior.
  - Use comfort measures
  - Set behavioral limits
  - Encourage appropriate anger expression
  - Pain relief, see analgesia protocol
  - Active listening
  - Allow for personal space
  - Toileting/hydration/fluids offered
  - Increased observation
  - Medication given
  - Companion/family at bedside

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.607**
	TITLE: BEHAVIORAL RESTRAINTS - PEDIATRIC	**Effective Date 11/01/2021**

BLS CARE:

- Document that patient is alert and denies any pain from restraints, every 10 minutes during transport.
- Document pulse and respiration.
- Perfusion within normal limits on all limbs in restraints.
- Document pt moves all extremities within restraints.
- Skin atraumatic.

ALS CARE:

- Cardiac monitor.
- Vitals every 10 minutes.
- If chemical restraint needed refer to BEHAVIORAL AND PSYCHOLOGICAL GUIDELINE # ***(159.606)***
- Receiving Physician must be notified upon arrival at destination if restraints initiated during transport.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.608**
	TITLE: BRADYCARDIA- PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Bradycardia may cause signs and symptoms including, but not limited to hypotension, poor end organ perfusion, altered level of consciousness, slow or absent ventilation, sudden collapse, lightheadedness, syncope, and fatigue.

BLS CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol. ***(159.614)***
- Determine if bradycardia is causing cardiopulmonary compromise.
- Begin CPR for HR less than 60 beats per minute with poor perfusion after oxygenation (i.e. hypotension with inadequate tissue perfusion, AMS, respiratory distress or failure).

ALS CARE:

- Attach ECG monitor/defibrillator/pacer
- Refer to Color Coded Length Based Resuscitation Tape for clinical guidelines.
- Establish vascular access- IO/IV ***(see IO/IV protocol 159.909).***
- Obtain Blood gas with electrolytes when possible.
- **EPINEPHRINE 1MG/10ML; 0.01** mg/kg IO/IV push. Max 1mg. Repeat every 3-5 minutes.
- **EPINEPHRINE 1MG/1ML; 0.1** mg/kg via Endotracheal tube. Max 10mg. Repeat every
  3-5 minutes.

- In cases of increased vagal tone or primary A/V block administer **ATROPINE** 0.02 mg/kg IO/IV push
  - Minimum single dose of 0.1 mg
  - Maximum single dose of 0.5 mg
  - Maximum total dose of 3 mg

- Consider cardiac pacing with initial rate of 80 beats per minute. Titrate rate up 100 bpm as needed for increased cardiac output.

- Consider cause of bradycardia-
  - Hypoxia (oxygenation)
  - Hypovolemia (IV Fluid Bolus)

- Hydrogen Ion (Acidosis)
- Hyperkalemia/Hypokalemia (potassium)
- Hypothermia (temperature)
- Tablets/Toxins (drug overdose)
- Trauma
- Tension Pneumothorax
- Tamponade
- Thrombus (Pulmonary / Coronary)

Pediatric / Children Vitals

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

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.609**
	TITLE: CARE OF THE NEWBORN- POST DELIVERY	**Effective Date 11/01/2021**

Classification of Transport: ALS

BLS CARE:

- Keep newborn warm and dry. Quickly dry the newborn.
- Place newborn on its back with the head slightly below its body, and neck slightly extended.
- Place a small folded blanket about ¾ inch under shoulders to help maintain proper position.

ALS CARE:

- Using bulb syringe, suction mouth and nose as necessary until airway is clear.
- Assess the newborn immediately after birth, respiratory rate should be between **30-60** breaths per minute and heart rate should be between **100-205** beats per minute. Drying should stimulate newborn to breath, cry, and become active.
- If additional stimulation is required flick your finger against the soles of feet or gently rub the middle of the back in a circular manner.
- Resuscitation and transport should not be delayed obtaining **APGAR** scores.
- If tactile stimulation does not increase respiratory rate, assist ventilations with a pediatric bag valve mask attached to high concentration oxygen.
- Ventilation should be performed at a minimum of **30** breaths per minute, and reassessment should take place in **15-30** seconds.
- If no change in respiratory rate, continue ventilations with reassessment every **15-30** seconds.
- Assess the heart rate at the brachial or femoral artery. If heart rate less than **100** continue to assist ventilations with bag valve mask, if heart rate less the **60** beats per minute begin chest compressions.

APGAR SCALE

- **APGAR** scores will be recorded at: [1] Birth (1 Minute), [2] (5 Minutes), [3] (10 Minutes)

SIGN	0	1	2
Heart rate	Absent	Below 100	Over 100
Respiratory effort	Absent	Slow, irregular	Good, crying
Muscle tone	Limp	Some flexion of extremities	Active motion
Response to catheter in nostril (tested after oropharynx is clear)	No response	Grimace	Cough or sneeze
Color	Blue, pale	Body pink, extremities blue	Completely pink

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.610**
	TITLE: FOREIGN BODY AIRWAY OBSTRUCTION-PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Partial Airway Obstruction:

- Allow patient to assume a position of comfort.
- Provide Oxygen as needed, as per policy ***(159.614)***

Infant less than 1 year of age

1. Confirm severe airway obstruction, check for onset of severe breathing difficulty, silent cough.
2. Give up to 5 back slaps, up to 5 chest thrusts
3. Repeat until effective or victim becomes unconscious.
4. Upon victim becoming unconscious, activate emergency response team if second rescuer is available.
5. Begin CPR.
6. Look into mouth when opening the airway during CPR, use finger sweep only to remove visible foreign body in unresponsive victim.
7. Continue one person CPR 5 cycles or 2 minutes. Two person CPR 10 cycles or 2 minutes.
8. Activate dispatch, rapid response team.
9. Proceed to destination.

Child, 1 year to adolescent

1. Ask, “Are you choking?”
2. Give abdominal thrusts/Heimlich maneuver.
3. Repeat abdominal thrusts until effective or patient becomes unresponsive.
4. Upon victim becoming unconscious, activate emergency response team if second rescuer is available.
5. Begin CPR.
6. Look into mouth while opening airway during CPR. Use the finger sweep only to remove visible foreign body in unresponsive victim.
7. Continue one person CPR 5 cycles or 2 minutes. Two person CPR 10 cycles or 2 minutes.
8. Activate dispatch, rapid response team.
9. Proceed to destination.

Consider other Advanced Airway Protocols for management.
Contact Medical Direction as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.611A**
	TITLE: Pediatric Glycemic Management	**Effective Date 11/1/2022**

Classification of Transport: ALS

Hypoglycemia can be due to inadequate glucose intake or increased glucose utilization. Stress and other factors can cause glucose to fall to critical levels. Signs and symptoms may include but are not limited to: weak rapid pulse, cold clammy skin, weakness, ataxia, headache, irritability, agitated/bizarre behavior or coma. Any patient who demonstrates signs and symptoms of hypoglycemia and has a glucose level less than 70 mg/dL requires treatment.

Signs and Symptoms of Hyperglycemia include, but not limited to polyuria, polydipsia, tachycardia, orthostasis, tachypnea, nausea, vomiting, ketosis and/or altered mental status/coma. Diabetic Ketoacidosis (DKA) is a hyperglycemic crisis with ketosis, metabolic acidosis, dehydration, and elevated anion gap.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.614)***
- Perform blood glucose testing.
- For hypoglycemia, offer PO sugar in the form of a high carbohydrate food or drink or commercially prepared glucose supplement.
- Reassess frequently for change in presentation.

ALS CARE:

- Obtain IV access if not established
- Establish/Continue cardiac monitor.
- HYPOGLYCEMIA: If blood glucose is less than 70 mg/dL and symptomatic and unable to tolerate PO glucose:
    - Then administer **DEXTROSE 10% (D10) IV.**
        - **DEXTROSE 10% (D10) IV** 2 mL/kg, slow IV Push up to 250 mL. May repeat q 15 Minutes x 2 doses.
        - If no IV access, administer **GLUCAGON** 0.1 mg/kg to MAX 1 mg IM

- HYPERGLYCEMIA: If blood glucose level is greater than 400mg/dL (DKA):
    - Ensure IV Fluids are infusing, Goal is 20mL/kg NSS Bolus, up to 1L. May repeat in 15 minutes.
    - Ensure 2 IV access sites, if possible.
    - Obtain or repeat Blood Gas (VBG or ABG) and Blood Chemistry within 2 hours of treatment.

- Maintain **REGULAR INSULIN** infusion for DKA treatment (ie hyperglycemic with an elevated anion gap acidosis, ketosis, dehydration).
- Encourage sending facility to start **INSULIN INFUSION** prior to transport, if not done and indicated for treatment DKA. Contact Medical Control, as needed, for assistance. (Insulin is not carried on Unit, must be started prior to transport).
- **INSULIN INFUSION** should be a fixed infusion at 0.1 unit/kg/hr after initial NS Fluid bolus and lab value reassessment. Endpoint of Insulin infusion is closure of the anion gap. (AH Glucommander setting continued)
- Blood Sugar measurements are q 1 hour while on insulin infusion. Treat hypoglycemia as above.
- Blood Chemistry measurements q 2 hours. Maintain **INSULIN INFUSION** for elevated anion gap. (AG = Sodium-(Chloride+CO2))
- Initiate or continue IV Fluids post NSS Bolus at:

    - Total Fluid Rate (TFR) of NSS at 1.5 maintenance rate.
    - If BGL is < 350 mg/dL, Initiate D5NS at 50% of TFR with NSS at 50% TFR.
    - If BGL is < 200 mg/dL, Initiate D5NS at 100% TFR, stop NSS.
    - If BGL is <100 mg/dL, increase D5NS 25% TFR, decrease INSULIN Infusion to 0.05 unit/kg/hr, recheck BGL in 30 minutes.
    - If BGL is < 70 mg/dL increase D5NS 25%, stop INSULIN Infusion, recheck BGL in 30 minutes.

421 Rule: 4mL/kg/hr for 1st 10kg + 2mL/kg/hr for 2nd 10kg + 1mL/kg/hr

43 kg Patient is 40+20+23 = 83 mL/hr Maintenance Rate
43 kg Patient is 125mL/hr for 1.5 Maintenance Rate.

Monitor for signs and symptoms of Cerebral Edema with DKA patients, such as: AMS, headache, vomiting, seizures, hypertension/bradycardia, temperature change. Consider **MANNITOL IV INFUSION** 1g/kg over 30 minutes for increased ICP or **3% HYPERTONIC SALINE** 1 to 5 mL/kg, max 250 mL, over 20 minutes for increased ICP. **(159.853)**

- If combative, see behavioral protocol. ***(159.607)***
- If no response, see altered mental status protocol. ***(159.606)***
- Recheck blood glucose 15 minutes after the administration of **DEXTROSE**

CONTACT MEDICAL CONTROL, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.612**
	TITLE: INTUBATION GUIDELINES– PEDIATRICS	**Effective Date 11/01/2021**

Classification of Skill: ALS

To provide a patent airway to any patients who are not able to adequately oxygenate and ventilate on their own.

CRITERIA FOR INTUBATION

- Unable to oxygenate. (Hypoxia)
- Unable to ventilate. (Hypercapnia)
- Unable to maintain open airway
- Predicted loss of airway due to clinical course. (Anaphylaxis, angioedema, airway burns, etc.)

See other Protocols for Complete Airway Management

Contact Medical Direction, as needed

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.613**
	TITLE: NAUSEA/VOMITING - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS if medication is needed/given

Consider a differential diagnosis in all patients with new onset vomiting during transport. Assessment may include but not limited to signs of infection, distended abdomen, cardiac ischemia, increased intracranial pressure, and drug withdrawal.

BLS CARE:

- BLS primary survey.
- Keep patient in lateral recumbent or position of comfort.
- O2 per oxygen therapy protocol. ***(159.614)***
- Oral suctioning as needed.
- Obtain history of most recent dosage of antiemetic medication.

ALS CARE:

- Establish/Continue cardiac monitor.
- IV access.
- **ZOFRAN** 0.15 mg/kg IV/PO/SL/ODT max 8 mg.
- Consider IV Fluid administration to prevent/treat dehydration - Normal Saline 20 ml/kg bolus IV. Maximum 2 doses.
- Monitor patient for bradycardia secondary to vagal stimulation.

Contact Medical Control for persistent Nausea/Vomiting, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.614**
	TITLE: OXYGEN THERAPY PROTOCOL - PEDIATRICS	**Effective Date 11/01/2021**

Review all methods of oxygenation and ventilation prior to transport. Available equipment includes nasal cannula, non-rebreather, high flow oxygen mask, bag valve mask, Venturi mask, King LT-D, LMA, CPAP, and endotracheal tubes. Use positioning as needed to maintain airway. Monitor patients for signs of impending respiratory failure and criteria for intubation. Attempt to determine pre-transport patient status regarding intubation, mechanical ventilation, and DNR status. Anticipate blunted respiratory drive prior to the administration of oxygen in patients with CO_2 retention.

BLS CARE:

- AdventHealth EMS Department clinicians shall always ensure that the patient has an adequate airway and proper oxygenation.
- Continuous pulse oximetry is required for all patients that may or currently requires oxygen therapy.
- Keep patient at oxygen saturation of 94% or greater using the following Standard Oxygen Delivery Devices:
    - Nasal Cannula: Standard initial flow of 2 LPM. Flow rates are between 1-15 LPM. High flow NC (HFNC) is used for short term to prepare for airway interventions.
    - Venturi Mask: The liter flow and oxygen percentage should be adjusted as instructed by Respiratory Therapy prior to transport.
    - Non-Rebreather Mask: The bag should be filled before applying to the patients face. Minimum recommended flow of 10 LPM. Never allow the bag to completely collapse during inspiration.
    - Heated High Flow Nasal Cannula: 2l/kg/min to a max. of 50L/min flow rates. Use **OXYGEN** blender to adjust FiO2 to maintain SpO2 goals 94%-99%.

ALS CARE:

- Anticipate assisting respirations with bag valve mask or endotracheal intubation if signs of impending respiratory failure or criteria for intubation develop.
- Evaluate and observe patient ventilation.
    - Assess airway and document rate of respirations, breath sounds, and make comparisons to both sides.
    - Assess if chest rise/expansion is symmetrical.
    - Assess position of patient (sniffing, tripod, orthopnea).
    - Assess work of breathing, including retractions, nasal flaring, accessory muscle use, head bobbing, and grunting.

- If patient is unable to maintain adequate oxygen saturations on supplemental oxygen, it is likely the patient requires an increased level of PEEP (Positive end-tidal Expiratory Pressure) to overcome a pathologic shunt such as pneumonia, CHF, broncho-constriction, etc.
- PEEP contraindicated in untreated or suspected pneumothorax.

- If patient develops impending respiratory failure or criteria for intubation, see Advanced Airway Protocols – Pediatric ***(159.602).***

Contact Medical Direction as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.615**
	TITLE: RAPID SEQUENCE AIRWAY - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS/CCT/Flight

BLS Care:

Quality patient care always includes Airway assessment, management and maintenance. 3 parts to airway management include:

1.Open the airway: Head Tilt-Chin Lift or Jaw thrust

2.Maintain the airway open: body positioning, OPA or NPA, suction as needed.

3.Closely monitor airway changes throughout patient contact: Abnormal sounds usually indicted upper airway obstruction such as snoring, gurgling, grunting, stridor, etc. Whereas wheeze, rhonchi, crackles etc. are lower airway pathology. SpO2 decrease is a very late sign of airway compromise, where EtCO2 waveform capnography can be the earliest indicator of ventilation changes that will eventually affect oxygen saturations.

Provide oxygen and ventilatory support as needed and detailed in other protocols.

ALS Care:

"Crash intubations" is a term used for the intubation of an unresponsive, apneic patient, not requiring any sedative or paralytic pharmaceuticals. If a patient is found to be unresponsive, apneic, "Crash Intubation" is indicated. All the guidelines to follow apply to the "Crash intubation", apart from RSI medications.

Once the patient is intubated in a "Crash Intubation" manor, it is common for their LOC to improve rapidly and require sedation after ventilation and re-oxygenation. It is then required to sedate the patient to maintain the airway open as listed below.

Sedative assisted intubation is not an ideal airway management procedure. If a patient is spontaneously breathing and has intact airway reflexes, it is ***not*** recommended to give sedatives only to facilitate intubation. An example of this would be to give only a benzodiazepine and/or fentanyl to intubate a spontaneously breathing patient. This ***should not*** be a standard airway management practice.

Delayed Sequence Intubation (DSI) with a dissociative anesthetic such as **KETAMINE** is a different procedure to resuscitate patients who are in shock, combative, altered with a depressed cardiopulmonary reserve. These patients can be given **KETAMINE** at 1mg/kg Slow IV Push or divided doses, placed on CPAP or BiPAP or High Flow Nasal Cannula for resuscitation. Head of Bed Elevated, Emergency Airway Equipment at the ready bedside and suction available. If a "Crash Intubation" situation arises from the DSI procedure, the patient should be emergently intubated or supraglottic airway inserted as needed.

Our first attempt with intubation MUST be our best attempt.

Resuscitate before RSI Induction to prevent Cardiac Arrest.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.615**
	TITLE: RAPID SEQUENCE AIRWAY - PEDIATRIC	**Effective Date 11/01/2021**

CCT/FLIGHT CARE:

Rapid Sequence Induction (RSI) airway management is used to secure the airway of a patient who is in acute respiratory failure or meets the criteria for intubation per our protocol. ***(159.612)***

If after two unsuccessful attempts at intubation proceed to the advanced airway protocol ***(159.615)***

Special Care needs to be taken during RSI to prevent malignant hyperthermia. Malignant Hyperthermia is a severe reaction to certain medications used for Rapid Sequence Intubation (RSI).

MH symptoms include muscle rigidity/spasm, dyspnea, tachycardia increased body temperature, excessive diaphoresis and mottled skin. In most cases patients show no signs or symptoms of susceptibility to malignant to hyperthermia until exposed to the RSI medications. A family history of malignant hyperthermia excludes the patient from receiving RSI with **SUCCINYLCHOLINE**. Malignant hyperthermia (MH) manifests clinically as a hypermetabolic crisis when an MH-susceptible (MHS) individual is exposed to a volatile anesthetic or **SUCCINYLCHOLINE**.

DSI with **KETAMINE** maybe a better option if MH is suspected or any contraindications to **SUCCINYLCHOLINE**.

Signs of a Difficult Airway:

If a difficult airway is predicted, then RSI with a paralytic may not be the best course of action and a DSI procedure may be best. Any concern, with time permitting, consult Medical Control to discuss the case and concern.

All RSI Procedures require pre-planning and equipment setup prior to induction.

An "Airway Time Out" should take place, led by the team leader, to ensure a unified plan of action

CCT/FLIGHT CARE:

INDICATIONS:

1. Unable to oxygenate. (Hypoxia)
2. Unable to ventilate. (Hypercapnia)
3. Unable to maintain open airway
4. Predicted loss of airway due to clinical course. (Anaphylaxis, angioedema, airway burns, etc.)

CONTRAINDICATIONS: (for SUCCINYLCHOLINE)

- Potential Hyperkalemia
- Chronic Renal Failure/hemodialysis access
- History of Malignant Hyperthermia
- Guillain-Barre syndrome

- Muscular dystrophy
- Myasthenia Gravis
- Difficult Airway is Predicted

PREPARATION:

- Pre-oxygenate with 100% O2 via nasal cannula (leave NC in place until intubation is complete)
- Monitor oxygen saturation, and waveform capnography ETCO2.
- Ensure functioning IV, preferably 2 IV sites
- Difficult Airway Assessment
- Prepare ET Tube and Video Laryngoscope

Have a "Back Up Plan" and equipment readily available for failed intubation

RSI PROCEDURE:

Sedation must be given with paralytic medications.

Sedation/Analgesia:

- **ETOMIDATE**: 0.3 mg/kg (actual body weight) IV Push.

  OR

- **KETAMINE**: 2 mg/kg (ideal body weight) IV slow push.

  OR

- **MIDAZOLAM**: 0.1 mg/kg IV Push, Max. 4mg.

  AND

- **FENTANYL**: 1 to 2 mcg/kg (actual body weight) IV Push. Max dose 100mcg.

Paralysis:

- **SUCCINYLCHOLINE**: 2 mg/kg (actual body weight) IV Push.

  OR

- **ROCURONIUM**: 1 mg/kg (ideal body weight) IV Push.

INDUCTION MEDS HAVE SIMILAR ONSET,
THEREFORE, CAN BE GIVEN AT THE SAME TIME.

WAIT 30-60 SECONDS FOR ONSET OF MEDICATIONS BEFORE INTUBATION ATTEMPT.

- Keep high flow nasal cannula in place during induction, avoid ventilations with BVM during induction to help prevent gastric inflation and vomiting.
- Always have suction available to clear the airway as needed.
- **ETOMIDATE, SUCCINYLCHOLINE, ROCURONIUM OR VECURONIUM** do not offer any pain control, therefore **FENTANYL** should be included in every induction, if not contraindicated, i.e. allergy.
- Verify tube placement after successful Endotracheal Intubation with waveform capnography.

POST INTUBATION SEDATION:

- **FENTANYL** 1 mcg/kg iv Push and may repeat every 3-5 minutes as needed. Transition to **FENTANYL** Continuous Infusion when available and/or feasible, titrate **FENTANYL** for pain control to a maximum of 250 mcg/hour infusion. 1 to 3 mcg/kg/hr, titrate to goal of -3/-4 RASS.
- **MIDAZOLAM** 0.01 to 0.05 mg/kg IV Push every 3-5 minutes as needed maximum 10 mg or RASS of -4 to -5. Transition to **MIDAZOLAM** Infusion as needed
- **MIDAZOLAM** 0.02 to 0.1 mg/kg/hour, titrate to RASS of -4 to -5.
  Evaluation of the RASS score should be documented pre and post administration. After initial dose of **MIDAZOLAM** maximum infusion should not exceed 10 mg/hr.

POST INTUBATION HYPOTENSION:

Post intubation hypotension (PIH) is very common and caused not only by the medication effects but switching to positive pressure ventilation. IV fluid bolus and vasopressors are often needed. See protocols on hypotension and push dose vasopressors.

Monitor airway, ventilation, and hemodynamics with continual cardiac monitor, pulse oximetry, wave form capnography and frequent VS. VS q 5 minutes x 30 minutes post intubation then as per guidelines.

EMERGENCY REVERSAL OF ROCURONIUM OR VECURONIUM:

- **SUGAMMADEX** 16mg/kg/dose IV x 1 dose.

For the immediate reversal of **ROCURONIUM OR VECURONIUM** (Non-depolarizing musculoskeletal blockade) for any reason to restore spontaneous respirations. Airway and ventilations must be managed until the patient is adequately maintaining a normal minute volume and saturations. Repeat ABG if possible. Continue to closely monitor patient post reversal. Contact Medical Direction as soon as possible, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.616A**
	TITLE: RESPIRATORY EMERGENCIES-PEDIATRIC	**Effective Date 11/1/2022**

Classification of Transport: ALS

Respiratory distress is a clinical state with increased work of breathing, increased respiratory effort and use of accessory muscles. Respiratory failure is a clinical state of inadequate oxygenation and ventilation. Earlier recognition of respiratory distress and failure results in a better chance of a good outcome. Signs and symptoms of imminent respiratory failure include the following but are not limited to bradypnea, periodic apnea, bradycardia, diminished air movement, low oxygen saturation, coma, poor skeletal muscle tone and cyanosis.

BLS CARE:

- BLS primary survey.
- Oxygen administration per pediatric oxygen therapy protocol. ***(159.614)***
- Employ help of parents to assist with blow-by supplemental oxygen when necessary.

ALS CARE:

- Review Labs, CXR, CT, etc with sending Team.
- Establish/continue cardiac monitor.
- If foreign body is suspected, see foreign body protocol. ***(159.610)***
- If IV Access is necessary, use caution in cases of partial airway obstruction, added stress to the patient can worsen obstruction, use sound clinical judgement, Contact Medical Direction, as needed.
- Maintain patient in position of comfort, do not upset or agitate patient in any way if upper airway obstruction is suspected.
- If patient symptoms worsen, despite treatments, see pediatric advanced airway protocol ***(159.602)***

ASTHMA

An evidenced based approach to guide pediatric asthma care is the use of a scoring tool and clinical decision-making algorithms. The “PRAM” Score and the others like it, are very useful. Bronchodilators, steroids, and epinephrine are the mainstay of emergent asthma treatment.

- **ALBUTEROL** 2.5 mg via nebulizer every 15 minutes up to maximum of 4 doses. Each nebulizer to be accompanied with **ATROVENT** 0.5 mg.

- **METHYLPREDNISOLONE** 2 mg/kg IV with maximum dose 125 mg times 1 dose.
- If patient condition worsens despite **ALBUTEROL / ATROVENT** nebulizers give **EPINEPHRINE 1:1000**; 0.01 mg/kg IM, maximum dose 0.3 mg every 20 twenty minutes to maximum of 3 doses.
    - For use in patients with asthma history, acute bronchospasm, or anaphylaxis.
- Document the patient's PRAM or PASS Score after each intervention or q1h.
- Contact Medical Direction for Continuous ALBUTEROL Neb treatments.

Pediatric Respiratory Assessment Measure (PRAM) severity score components and values assigned by severity of each component([1,2])

	Component values			
Signs	0	1	2	3
Suprasternal retractions	No		Yes	
Scalene contraction	No		Yes	
Air entry[a]	Normal	Decreased at bases	Widespread decrease	Absent or minimal
Wheezing[a]	Absent	Expiratory only	Inspiratory and Expiratory	Audible without stethoscope or silent chest
O_2 saturation	≥ 95%	92–94%	< 92%	

[a]Most severe side is used for rating if asymmetry is noted between right and left lung.

Reference List

[1]Chalut DS, Ducharme FM, Davis GM. The Preschool Respiratory Assessment Measure (PRAM): a responsive index of acute asthma severity. J Pediatr. 2000 Dec;137(6):762-8.

[2]Ducharme FM, Chalut D, Plotnick L, Savdie C, Kudirka D, Zhang X, Meng L, McGillivray D. The Pediatric Respiratory Assessment Measure: a valid clinical score for assessing acute asthma severity from toddlers to teenagers. J Pediatr. 2008 Apr;152(4):476-80, 480.

Table 1 Pediatric asthma severity score calculation table

Score	1	2	3
Respiratory rate			
2 to 3 yr	⩽ 34	35 to 39	⩾ 40
4 to 5 yr	⩽ 30	31 to 35	⩾ 36
6 to 12 yr	⩽ 26	27 to 30	⩾ 31
Older than 12 yr	⩽ 23	24 to 27	⩾ 28
Oxygen requirements	> 90% on room air	85%-90% on room air	< 85% on room air
Auscultation	Normal breath sounds or end-expiratory wheeze only	Expiratory wheezing	Inspiratory and expiratory wheezing or diminished breath sounds
Retractions	⩽ One site	Two sites	⩾ Three sites
Dyspnea	Speaks in sentences, coos and babbles	Speaks in partial sentences, short cry	Speaks in single words/short phrases/grunting

BRONCHIOLITIS – RSV

- Nebulized **SALINE 0.9%** 3mL via breath activated nebulizer and suction secretions from airway, as needed
- Supportive care is usually all the is needed. Contact Medical Direction as needed.

CROUP

- Nebulized **SALINE 0.9%** 3mL via breath activated nebulizer
- **DEXAMETHASONE** 0.6 mg/kg IV/IO/IM/PO up to 20mg x 1 dose.
- If stridor, retractions, frequent barking cough administer **RACEMIC EPINEPHRINE 2.25%** 0.5 mL via breath activated nebulizer. Maximum 2 doses, 20 minutes between doses.
    - If **RACEMIC EPINEPHRINE** is unavailable, add 3mg **EPINEPHRINE 1:1000** (3mL) to a nebulizer for an emergent respiratory treatment.

Pneumonia:

Ideally for pneumonia or any septic or suspected sepsis, Antibiotics should be given prior to transport or continued during transport. If antibiotic treatment has not be started, encourage the sending team to start them or contact Medical Direction as needed. If antibiotics are indicated, the sooner they are started to better then clinical outcome is. Other than antibiotics, pneumonia care is supportive care. Optimize fluid administration, treat dyspnea, hypoxia, hypotension, pain, nausea/vomiting etc. as indicated in the appropriate protocols.

Submersion Injury:

Goal is to provide safe management and care for pediatric patients post submersion event during ED stabilization at referring hospitals and during Pediatric EMS transport. If oxygen saturations are less then 94% with no improve on supplemental oxygen or if increased work of breathing (WOB) is noted, submersion patients will likely require NIMV or MV support with PEEP. PEEP is the key to stabilizing and overcoming the physiological shunt of a submersion lung injury. Prolonged hypoxia (brain injury), shock and possibility of coexisting traumatic injuries complicate patient management.

- Provide Oxygen per oxygen therapy protocol
- Monitor closely for impending respiratory failure or criteria for intubation see Advanced Airway Protocol – Children's.

- For initial Ventilator settings: see Ventilatory Management-Children's.
- May increase PEEP by 1 cmH2O every 2-5 minutes to achieve O2 saturations > 94%. Notify MCP if PEEP at 10 cmH2O and unable to achieve adequate oxygenation.

- Maintenance of proper body temperature for a max temp of 36-37 degrees Celsius, if greater than 37 degrees and has not been given in the last 4 hours, request **ACETAMINAPHEN** 15mg/kg PO/PR/IV from the sending facility.
- Obtain I-stat blood gas, electrolytes and lactate if not done in ED.

Insert gastric tube (OG for suspected mid-facial trauma or if patient is intubated, NG otherwise) if not already in place; and OGT/NGT to intermittent low suction for gastric decompression, as needed.

- Consider C-Spine immobilization/SMR if trauma suspected.
- Consider indwelling urine catheter to monitor urine output.
- Initiate maintenance IVF with D5 NS @ 75% of maintenance rate based on weight in kg.
- Seizure management per Seizure Protocol-Children's.
- Shock management per Shock-Children's.
- Notify MCP/Medical Direction if signs and symptoms of increased intracranial pressure (changes in pupils, seizures, hypertension and bradycardia)

    - Consider **MANNITOL** 1gm/kg IV over 30 minutes, once.

    -OR-

    - Consider **3% HYPERTONIC SALINE** 1 to 5 mL/kg, max 250 mL, over 20 minutes for increased ICP. **(159.853)**

Pneumothorax:

Treatment of a tension pneumothorax should occur when an assessment has determined a clinical diagnosis of a tension pneumothorax. Clinical signs and symptoms of a tension pneumothorax include but are not limited to severe respiratory distress with cyanosis, decreased breath sounds on the affected side, chest pain, tachycardia, and hypotension. In addition, jugular venous distention may be present, tracheal shift away from the affected side, and loss of consciousness. Intubated patients will be increasingly difficult to ventilate.

CCT/Flight Care:

INDICATIONS:

- Chest decompression for relief of tension pneumothorax.

EQUIPMENT:

- 14-20 gauge 2 - 2.5-inch catheter over the needle (use largest IV per patient size).
- Sterile gloves.
- Tape.
- Sterile gauze pads.
- Povidone iodine swabs
- Occlusive dressing.
- Stop cock
- Extension set

PROCEDURE:

- Consider pain management if time allows, see analgesia pain management protocol.
- Locate decompression site. ***Identify the 2nd intercostal space in the mid-clavicular line*** *on the same side as the pneumothorax.*
- Don sterile glove and prepare site with povidone iodine swabs x 2 and allow to dry. Select appropriate size angio catheter (18 to 20-gauge angio catheter for most pediatric patients less then 40kg, see adult protocol for greater then 40kg, Protocol 159.917).
- *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.
- Attach stop cock with extension set with 12ml syringe.
- Secure the catheter taking care not to allow it to kink.
- Remove air/fluid by pulling back plunger on syringe.

- Repeat process until resistance is met and all air evacuated. Turn off stop cock but leave catheter in place until chest tube can be placed.
- Reassess lung sounds and patient condition. With catheter in position, patient should show significant improvement in color, respiratory effort, and vital signs.
- Monitor patient closely for signs of re-accumulation: increased respiratory distress, tachypnea, apnea, cyanosis, decreased breath sounds, bradycardia, altered V/S.
- Dress area with Occlusive dressing then cover with sterile gauze pad.

Continuing Chest Tube:

- Assess the dressing at thoracostomy site, confirm tube is secured.
- Assess the drainage system, mechanical suction, or gravity. Ensure that thoracostomy tube and drainage system are secure before and after every transfer of patient from bed to stretcher.
- Assess that the collection system remains below the level of the chest to prevent air/fluid from entering the pleural space.
- Never clamp the chest tube.
- Assess that the thoracostomy tube is connected to a drainage system. All thoracostomy tubes must be attached to a drainage system.
- Maintain suction at indicated level from referring facility.
- If tube becomes dislodged, do not reinsert thoracostomy tube. Secure the thoracostomy site with a Vaseline gauze and an occlusive dressing.

If patient condition deteriorates prepare for needle decompression per protocol.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.617**
	TITLE: SEIZURE- PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Search for correctable metabolic abnormalities such as hypoglycemia. Patients who are hypoglycemic may demonstrate the following clinical signs, but are not limited to weakness, dizziness, tachypnea, pallor, sweating, tremors, vomiting, and altered mental status.

BASIC CARE:

- BLS primary survey.
- Provide 100% supplemental oxygen via NRB.
- Obtain glucose value via glucometer.
- Seizure precautions.

ADVANCED CARE:

- Obtain IV/IO access.
- Obtain/continue cardiac monitor, SpO2, NIBP, wave-form capnography.
- If active seizure.
    - **LORAZEPAM** 0.05 mg/kg IV / IM / IO push, may repeat one time if seizure not controlled, or seizure reoccurs. Total maximum dose of 8 mg. Max. dose 4mg.
    - If no iv access, give **MIDAZOLAM** 0.2 mg/kg IN (max 10mg). May repeat x 1 if not controlled in 3 minutes.
- If patient hypoglycemic, manage as per Protocol ***(159.611)***
- If hyponatremic (sodium less than 130 mEq/L); Bolus NS 10 mL/kg up to 1 Liter.
- For Status Seizures (seizures not controlled after benzodiazepine administration);
    - **KEPPRA** (levetiracetam) 20mg/kg IV x 1 dose; Max. dose of 3000mg.
    - If no response, Add **FOSPHENYTOIN** 20mg/kg IV, Max dose 1g, x 1 dose.
    - If after **BENZODIAZEPINES**, **KEPPRA (Levetiracetam) AND FOSPHENYTOIN** seizure activity persists, proceed to RSI as per protocol ***(159.615)***.
- Establish advanced airway as needed (see advanced airway- pediatric protocol ***159.602)***.

Contact Medical Direction, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.618**
	TITLE: SHOCK - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Shock is defined as a clinical spectrum with any of the following signs and symptoms: altered mental status, clinically ill appearance, low blood pressure (systolic blood pressure), tachycardia, increased heart rate for age, tachypnea, decreased urine output, and systemic acidosis. Attempt to differentiate type of shock; hemorrhagic, hypovolemic, neurologic, cardiogenic, anaphylactic, and septic. All patients demonstrating signs and symptoms of shock must have support of heart rate, rhythm, fluid therapy, and distribution of blood flow. See Clinically defined parameters for Pediatrics in Tables on next page.

BLS CARE:

- BLS primary survey.
- **OXYGEN** administration per oxygen therapy protocol. ***(159.614)***
- Maintenance of proper body temperature.
- Place patient in supine position as clinically indicated and be prepared to suction as needed.
- Control active bleeding.
- Verify blood glucose level, treat per pediatric hypoglycemia protocol. ***(159.611)***

ALS/SCT CARE:

- Establish/continue ECG (12-lead if new onset of cardiogenic shock).
- Consider Advanced Airway management as per protocol 159.602
- Consider placing a urinary catheter for strict I&O measurement. Ideally urine output should be 0.5 to 1 mL/kg/hr.
- Consider Arterial Line for invasive blood pressure monitoring and frequent blood sampling.

HEMORRHAGIC/HYPOVOLEMIC/ANAPHYLATIC/SEPTIC/NEUROGENIC:

- Establish IV line if not done previously. Rapid infusion of **NORMAL SALINE or LR** 20 ml/kg, up to 1 L, repeat 20 mL/kg after evaluation in 3-5 minutes, max of 3 boluses, up to 60 mL/kg.
- **LR** contraindicated in hyperkalemia, hypercalcemia, liver failure or with the antibiotic ceftriaxone or blood products (line incompatibility).

CARDIOGENIC SHOCK:

- Establish IV line if not done previously. Rapid infusion of **NS/LR** 5-10 mL/kg over 10-20 minutes, repeat **NORMAL SALINE** 5-10 mL/kg after evaluation in 10-20 minutes if still showing Systolic Blood Pressure less than defined B/P in Table 3 on next page.
- Monitor for arrhythmias

Table 1:

Heart Rate (rate/min)		
Age	**Awake Rate**	**Sleeping Rate**
Newborn to 3 months	85 to 205	80 to 160
3 months to 2 years	100 to 190	75 to 160
2 to 10 years	60 to 140	60 to 90
>10 years	60 to 100	50 to 90

Table 2:

Respiratory Rate (breaths/min)	
Age	**Rate**
Infant	30 to 60
Toddler	24 to 40
Preschooler	22 to 34
School-age child	18 to 30
Adolescent	12 to 16

Table 3:

Definition of Hypotension by Systolic Blood Pressure and Age	
Age	**Systolic Blood Pressure**
Term neonates (0 to 28 days)	<60 mm Hg
Infants (1 to 12 months)	<70 mm Hg
Children 1 to 10 years (5th BP percentile)	<70 mm Hg + (age in years x 2) mm Hg
Children >10 years	<90 mm Hg

VASOPRESSORS:

Contact Medical Direction, as needed, for initial strategy

- Cold Shock (Cardiogenic with poor cardiac output, need inotropy):
  - **EPINEPHRINE** 0.02 to 0.1 mcg/kg/min, titrate to resuscitation goals
    - Mix Concentrations of infusion based on weight:
      - Weight less than 5kg, mix in D5W or NS to 4mcg/mL
      - Weight more than 5kg, mix in D5W or NS to 50 mcg/mL

- Warm Shock (Distributive Shock, i.e., Sepsis, anaphylaxis, need vasoconstriction):
  - **NOREPINEPHRINE** 0.02-0.1 mcg/kg/min, titrate to resuscitation goals
    - Mix Concentrations of infusion based on weight:
      - Weight less than 5kg, mix in D5W or NS to 4mcg/mL
      - Weight more than 5kg, mix in D5W or NS to 50 mcg/mL

Adjunct Medications for Shock (Contact Medical Direction):

- **SODIUM BICARBONATE** 1 to 2 mEq/kg for severe metabolic acidosis, as per ABG
- **CALCIUM GLUCONATE** 100mg/kg, max 2 g for hyperkalemia (potassium level greater than 6 with abnormal ECG) or hypocalcemia (ionized calcium level less than 1.1)
- **Push Dose Pressors, as per Medical Direction.**
- **Corticosteroids, as per Medical Direction.**
- **2nd line vasopressors, inotropics and blood products Contact Medical Direction for guidance, as needed.**

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.619**
	TITLE: TACHYCARDIA- PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Tachycardia represents signs and symptoms which include but are not limited to lightheadedness, dizziness, syncope, irritability, lethargic, respiratory distress/failure, shock with hypotension, poor end organ perfusion, altered level of consciousness syncope. Unstable rhythms may deteriorate to cardiac arrest.

BLS CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol. ***(159.614)***

ALS CARE:

- Obtain IO/IV access
- Establish/Continue cardiac monitor, NIBP, SpO2, wave form capnography

Narrow complex tachycardia (less than or equal to 0.09 seconds).

- Sinus tachycardia – Usually <220/min in infants, <180/min in children
- Look for treatable or reversible causes,
  - Hypoxia (oxygenation)
  - Hypovolemia (fluids)
  - Hydrogen Ion (acidosis)
  - Hypoglycemia (blood glucose)
  - Hyperkalemia / Hypokalemia (potassium)
  - Hypothermia / Hyperthermia (temperature)
  - Toxins/Tablets (drug overdose)
  - Thrombosis – heart (AMI)
  - Tension pneumothorax
  - Tamponade (cardiac)
  - Thrombosis – lungs (PE)
  - Trauma

- **Supraventricular tachycardia.**
- Be suspicious of SVT in patients less than one year of age with heart rate greater than 220 bpm.
- Be suspicious of SVT in patients greater than one year of age with heart rate greater than 180 bpm.

STABLE:

- Obtain 12 lead ECG
- Perform vagal maneuvers.
- If IO/IV access available, **ADENOSINE** 0.1 mg/kg IO/IV (maximum 6 mg), if not effective, may give 0.2 mg/kg I /IO (max. 12mg).

UNSTABLE:

- Synchronized Cardioversion 0.5-1 J/kg, increase to 2 J/kg if first attempt not successful.
- Sedate if possible prior to Synchronized Cardioversion. Do not delay Synchronized Cardioversion to give medication for sedation. Do not sedate patient who is hypotensive or hemodynamically unstable or exhibiting signs of instability caused by the tachycardia.
- **MIDAZOLAM** 0.1 mg/kg IO/IV, maximum dose 5mg, consider Pain Management protocol post cardioversion, as needed.

WIDE COMPLEX TACHYCARDIA WITH A PULSE *(greater than 0.09 seconds)*

STABLE:

- If patient is stable, obtain IV/IO access.
- If IV/IO access available, **ADENOSINE** 0.1 mg/kg IV/IO (maximum 6 mg).
- Contact medical direction for next antiarrhythmic, if unreachable consider **LIDOCAINE** bolus at 1mg/kg, re-bolus at 0.5 mg/kg, max bolus of 3mg/kg, followed by a maintenance infusion at 20 mcg/kg/min.

OR

- **AMIODARONE** 5mg/kg IV/IO mixed in 100 mL of D5W over 20 minutes.

UNSTABLE:

- Synchronized Cardioversion 0.5-1 J/kg, increase to 2 J/kg if first attempt not successful.
- Do not delay Cardioversion to sedate patient.
- **MIDAZOLAM** 0.1 mg/kg IO/IV, maximum dose 5mg, consider Pain Management protocol post cardioversion, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.620**
	TITLE: VENTILATORY MANAGEMENT - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: CCT/Flight

The below ranges should be noted for initial ventilatory management. However, ventilatory settings may be adjusted as part of the ventilatory management process. Please ensure and verify all adjustments and settings with the Respiratory Therapist and send/receiving Provider.

CCT/FLIGHT CARE:

- Confirm placement and security of endotracheal tube.
- Transport patient on AdventHealth EMS Department /Florida Flight 1 ventilator maintaining all parameters as ordered by sending physician.
- Document ETT placement and security with each transfer of patient onto AdventHealth EMS Department /Florida Flight 1 stretcher and with each transfer entering and exiting transporting vehicle.
- Ensure adequate sedation, analgesia, and if required, paralysis for all patients on mechanical ventilation.
- If restraints are needed to protect the patient's airway, see Behavioral Restraints protocol ***(159.607)***
- See sedation analgesia protocol. ***(159.604)***
- Maintain current mode of operation (SIMV-PRVC or APV-SIMV)
- Select ventilation rate:
  - Infants <1 yr: 25-35 BPM
  - Children >1 yr: 15-25 BPM
- Set I:E ratio
  - 1:2 or 1:3
- Set tidal volume
  - Initial setting will be 6-8 mL/kg based on IBW
- Set FiO_2
  - Starting at 100%, titrate to maintain SpO2 >94%
- Set PEEP
  - 5 cm/H_2O
- Maintain continuous $EtCO_2$ and SpO_2 on all ventilated patients.

Titrate settings to meet resuscitation goals, Contact Medical Direction, as needed.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.621**
	TITLE: VENTRICULAR FIBRILLATION / PULSELESS VENTRICULAR TACHYCARDIA- PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

If you witness a sudden collapse or cardiac arrest send someone to activate the emergency response team and begin CPR until an AED or defibrillator is available. If you do not witness a sudden collapse or cardiac arrest and you are alone, perform CPR for two minutes then apply AED or defibrillator.

BLS CARE:

- Check for responsiveness.
- Immediately initiate help for additional resources.
- Check pulse if no pulse begin chest compressions.
- Begin CPR per AHA guidelines.
    - Push hard and fast (at least 100-120/min)
    - Ensure full chest recoil
    - Minimize interruptions in chest compressions
- CPR performed at 30 compressions: 2 ventilations for one rescuer, 15 compressions: 2 ventilations for two rescuer.
- Attach and use AED as soon as possible with witnessed arrest.
- Immediately after analysis by AED resume CPR for 5/10 cycles if a shock has been delivered by the AED. If no shock has been delivered, resume CPR.
- Allow re-analysis by AED following prompts from device.

ALS CARE:

- For clinical guidelines on all pediatric cardiac arrests reference Color Coded Length Based Resuscitation Tape.
- Attach cardiac monitor.
- Establish IO/IV
- Defibrillate at **2J/kg** biphasic.
- Immediately resume CPR post defibrillation, times 2 minutes.
- If VF/VT converts to another rhythm, refer to appropriate protocol for further treatment.
- If VF/VT continues:
    - Defibrillate at **4 J/kg** biphasic.
- **EPINEPHRINE 0.1mg/mL;** 0.01 mg/kg IO/IV; Repeat every 3-5 minutes.
- Defibrillate at **4 J/kg** biphasic. Repeat as needed every 2 minutes.

- **AMIODARONE** 5 mg/kg (maximum single dose of 300 mg) IO/IV push. May repeat 5 mg/kg IV/IO push to total dose of 15 mg/kg per 24 hours.
- **MAGNESIUM SULFATE** 25 to 50 mg/kg (maximum single dose of 2 grams) IO/IV push for Torsades de Pointes or Hypomagnesia.

Clinical sequence of medication administration:

- Continue cycles of CPR per PALS protocol.
- CPR for two minutes (5/10 cycles) then rhythm check.
- Shock if clinically indicated.
- Immediately resume CPR, give necessary medications while CPR is in progress.
- Repeat clinical sequence throughout cardiac arrest.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.622A**
	TITLE: HEAD TRAUMA - PEDIATRIC	**Effective Date 11/1/2022**

BLS CARE:

- BLS primary survey.
- Determine initial Glasgow Coma Scale.
- Oxygen administration per oxygen therapy protocol
- Check blood glucose level.

ALS CARE:

- Airway management per advanced airway protocol**.**
- Establish/Continue cardiac monitor.
- Treat pain, see analgesia pain management protocol
- Hypotension (see reference chart for age) administer **NS** 20 mL/kg bolus IV (max total per bolus 1L) may repeat up to total of 60 mL/kg.
- Control external hemorrhage.
- Treat seizures, see seizure protocol.
- Monitor for signs of increased intracranial pressure including but not limited to:
  - decreasing Glasgow Coma Scale of two or more points
  - development of a sluggish or nonreactive pupil
  - development of hemiplegia
  - hemiparesis
  - Cushing's triad (HTN, Bradycardia, Respiratory changes).
- If Patient Hypertensive (See reference chart for age); call Medical Control and consider:
  - **MANNITOL** 1gm/kg IV (max dose) over 30 minutes
  - **3% HYPERTONIC SALINE 1 to 5 mL/kg, max 250 mL, over 20 minutes for increased ICP. (159.853)**
- Elevate head of bed 30 degrees if no spinal trauma present.

Contact Medical Control, as needed.

General Vital Signs and Guidelines

Age	Heart Rate (beats/min)	Blood Pressure (mmHg)	Respiratory Rate (breaths/min)
Premature	110-170	SBP 55-75 DBP 35-45	40-70
0-3 months	110-160	SBP 65-85 DBP 45-55	35-55
3-6 months	110-160	SBP 70-90 DBP 50-65	30-45
6-12 months	90-160	SBP 80-100 DBP 55-65	22-38
1-3 years	80-150	SBP 90-105 DBP 55-70	22-30
3-6 years	70-120	SBP 95-110 DBP 60-75	20-24
6-12 years	60-110	SBP 100-120 DBP 60-75	16-22
> 12 years	60-100	SBP 110-135 DBP 65-85	12-20

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.623**
	TITLE: POISONING/TOXIC OVERDOSE - PEDIATRIC	**Effective Date 11/01/2021**

Classification of Transport: ALS

Attempt to identify the toxidrome in any suspected drug overdose/poisoning. A toxidrome is set a signs and symptoms caused by a particular drug or toxin. Suspect overdose or poisoning in appropriate clinical setting.

BLS CARE:

- Call Poison Control if not already done in ED
- Administer oxygen per oxygen therapy protocol.
- Establish IV
- Determine blood glucose.
- Monitor SpO2

ALS CARE:

- Establish/continue cardiac monitor
- Monitor EtCO2
- Obtain 12 lead EKG if not done in ED
- Initiate NS or LR at maintenance for weight.

CONSIDER CAUSE:

- ***Opiate overdose findings***; central nervous system depression, respiratory depression, Miosis (pinpoint pupils). Manage patient airway appropriately prior to **NALOXONE** administration.
  - Indications for **NALOXONE**: slow and shallow respiration, need assisted ventilation, are hypotensive or bradycardic
  - Infants and Children <5yrs or <20kg: Give **NALOXONE** 0.1 mg/kg/dose IV/IM every 2 minutes for a maximum of 4 mg.
  - Children >5yr and >20kg: Give **NALOXONE** 2 mg/dose IV/IM every 2 minutes for a maximum of 4 mg.
  - Call MCP if more than 2 doses needed for continuous **NALOXONE** infusion. **NALOXONE** infusion 24 to 40 mcg/kg/hr, adjusting dose up or down by no more than about 25% to titrate to RASS score of -1 to 0.
  - Endpoint of opiate withdrawal is adequate oxygenation and ventilation.

- ***Beta blocker/Calcium channel blocker overdose findings***; cardiac arrhythmias, shock, hypoglycemia, seizures, bradycardia, and decreased level of consciousness.
  - Treatment for patients demonstrating beta blocker overdose symptoms via appropriate protocols. IV fluids/ IV **GLUCAGON** for hypoglycemia

EPINEPHRINE for bradycardia, severe hypotension/ IV **CALCIUM GLUCONATE** for (see shock protocol)

- ***Alpha 2 Agonist*** **(Clonidine)** Bradycardia, hypotension, pinpoint pupils, respiratory depression.
  - Infants and Children <5yrs or <20kg: Give **NALOXONE** 0.1 mg/kg/dose IV/IM every 2 minutes for a maximum of 4 mg.
  - Children > or = 5yr and > or = 20kg: Give **NALOXONE** 2 mg/dose IV/IM every 2 minutes for a maximum of 4 mg.
  - Call MCP if more than 2 doses needed for continuous **NALOXONE** infusion. **NALOXONE** infusion 24-40 mcg/kg/hr, adjusting dose up or down by no more than about 25% to titrate to RASS score of -1 to 0.
  - **ATROPINE** 0.02mg/kg IV **AND EPI** 0.1mg/kg IV for severe hypotension and bradycardia, may need endotracheal intubation.
- ***Cocaine toxicity findings***; hyperpyrexia, tachycardia, altered mental status, seizures, euphoria, fatigue, elevated blood pressure, and hypoxia.
  - Indications for **LORAZEPAM**: cardiopulmonary complications, arrhythmias, neurologic CNS complications, seizures, and altered mental status.
  - **LORAZEPAM** 0.05 mg/kg IV / IM / IN and may repeat times one dose for a max of 2mg/dose.

- ***Tricyclic antidepressants findings***; altered mental status, sinus tachycardia, prolongation of QT interval, delirium, mydriasis (dry eyes), urinary retention, coma, seizures, QRS widening, hypotension, cardiac arrhythmias.
  - Indications for **SODIUM BICARBONATE:** seizures, cardiac arrhythmias, hemodynamic instability and wide QRS.
  - **SODIUM BICARBONATE** 1 mEq/kg IV over 2 minutes.
  - Check blood gas after each bolus to keep pH 7.5-7.55, repeat dose x 2 until QRS <100ms and notify MCP for possible **SODIUM BICARBONATE** infusion.

- ***Other Antidepressants (SSRI)***- altered mental status, agitation, obtundation, muscle spasms, fever, clonus, prolonged QT, widened QRS, GI symptoms
  - Manage Sei ures per Pediatric Sei ure Protocol.
- ***Aspirin toxicity findings*****-**Tachypnea, rapid breathing, ringing in ears, n/v, fever, hallucinations, bleeding, altered mental status.
  - Treatment for patients: IV Fluids (NS @ maintenance for weight.

- Indications for **SODIUM BICARBONATE:** hyperventilation and respiratory alkalosis PaCO2 <35.
- **SODIUM BICARBONATE** 1 mEq/kg IV over 2 minutes.
- Obtain blood gas and contact MCP for possible **SODIUM BICARBONATE** infusion.

- ***Acetaminophen toxicity findings*:** n/v, loss of appetite, fatigue,bruising,
  - Treatment of patients with Acetaminophen toxicity includes **ACETYLCYSTEINE and IV fluids** (NS @ maintenance for weight).
  - Continue the ACETYLCYSTEINE Protocol enroute during the transport, suggested regiment is as follows:
    - **ACETYLCYSTEINE IV**: 21-hour regimen: Consists of 3 doses; total dose delivered: 300 mg/kg
    - Loading dose: 150 mg/kg infused over 60 minutes; maximum dose: 15 g/dose
    - Second dose: 50 mg/kg infused over 4 hours; maximum dose: 5 g/ dose
    - Third dose: 100 mg/kg infused over 16 hours; maximum dose: 10 g/ dose
- ***Benzodiazepine***
  - **FLUMAZENIL** 0.01 mg/kg IV (MAX dose 0.2 mg)
  - May repeat q 1 min as needed
  - Max cumulative dose 1 mg.
  - **FLUMAZENIL** is contraindicated in patients prescribed benzodiazepines for seizures or anxiety disorders as it may cause seizures/withdrawal.

- ***Anticholinergics (BENADRYL)*** – thirst, hyperthermia, dilated pupils, tachycardia, flushing, hypertension and altered mental status
  - **LORAZEPAM** 0.05 mg/kg IV / IM / IN and may repeat times one for a max of 2mg/dose (total of 4mg).

- ***ADHD meds*:** altered mental status, tachycardia, hypertension, arrhythmias
  - **LORAZEPAM** 0.05 mg/kg IV / IM / IN and may repeat times one for a max of 2mg/dose (total of 4mg).

Contact Medical Control, as needed.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.701**
	TITLE: ASSESSMENT OF THE TRAUMA PATIENT	**Effective Date 11/01/2021**

Trauma patients require a rapid assessment and interpretation of the findings.

BLS CARE:

- BLS survey
- Primary assessment and general impression including respiratory, circulatory and neurologic systems.
- **A**irway and cervical spine immobilization, (see oxygen therapy protocol ***159.208***), (see spinal trauma protocol ***159.707***).
- **B**reathing / Oxygenation and ventilation needs to be evaluated.
- **C**irculation, hemorrhage, and perfusion: assess for circulatory system compromise or failure.
- **D**isability: determine central nervous system injury or deficit. Determine GCS score.
- **E**xpose and environment: remove as much clothing as necessary to confirm or determine absence or presence of injury. Hypothermia / Hyperthermia is a major concern. Minimize patient exposure to environmental factors based upon patient condition.
- **S**igns and Symptoms
- **A**llergies.
- **M**edications.
- **P**ast medical/surgical history.
- **L**ast meal.
- **E**vents.
- Splint fractures and dress wounds as clinically indicated.
- Direct pressure to all external hemorrhage.
- Tourniquet application based upon patient condition.

ALS CARE:

- Airway (see advanced airway protocol (***159.201***), breathing, circulation.
- Establish/Continue cardiac monitor.
- Continuous SpO2.
- Large bore IV access x 2.
- Treat Shock as per Protocol ***(150.417)***
- Reassessment pre and post fluid administration.

- Pleural decompression (protocol ***159.916***) if **ALL** of the following are present
  - Diminished or ipsilateral absent breath sounds.
  - Increased work of breathing or difficulty ventilating with bag valve mask.
  - Decompensated shock/hypotension (Systolic Blood Pressure less than 90 mm/Hg or MAP less than 60 mm/Hg).

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.702**
	TITLE: BURN MANAGEMENT	**Effective Date 11/01/2021**

Classification of Transport: ALS

Initial care should be to stop the burning process. Remove patient from any thermal source, and begin cooling with copious amounts of room temperature normal saline; do not use ice. If dry chemical burn, brush/remove all powder from patient before cooling with Normal Saline.

BLS CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol. ***(159.208)***
- Assess for other injuries in addition to burn.
- Maintain body temperature.

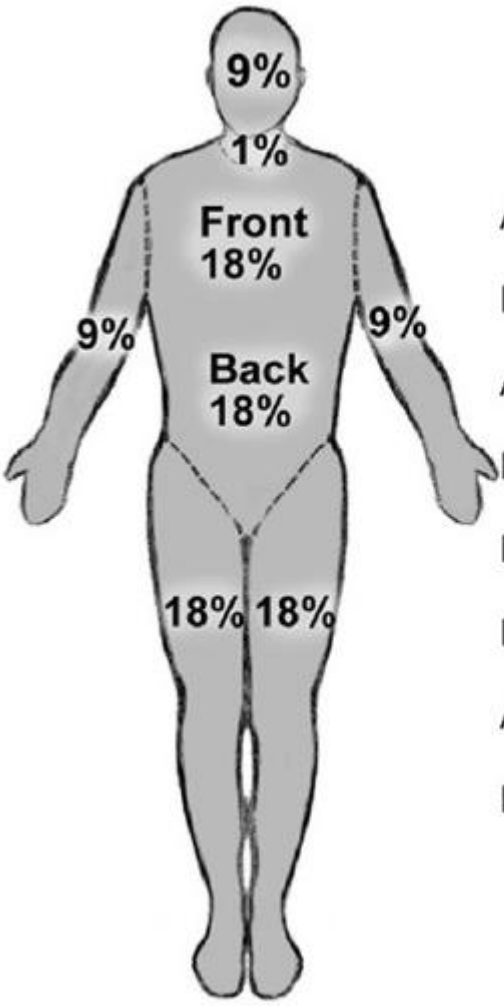
ALS CARE:

- Obtain IV access.
- Establish/Continue cardiac monitor.
- Apply dry sterile sheet to all burned surfaces to prevent contamination.
- Determine percent of Body Service Area burned, and whether first, second or third degree.
- Treat pain as per Pain Protocol ***(159.405).***

PARKLAND FORMULA

- Fluid requirements= Total burned Body Service Area x weight in kg x 4 mL
  - Give ½ of total requirements in 1st 8 hours then give 2nd half over next 16 hours.

FIGURE 1:



Adult body	% of total
Part	BSA
Arm	9%
Head	9%
Neck	1%
Leg	18%
Anterior trunk	18%
Posterior trunk	18%

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.703**
	TITLE: CHEST TRAUMA	**Effective Date 11/01/2021**

Classification of Transport: ALS

BLS CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol. (***159.208)***
- Assessment of breath sounds.
  - Observation
  - Auscultation
  - Palpation
  - Percussion
- Expose all necessary areas to visually assess for injury.

ALS CARE:

- Obtain two large bore IV.
- Establish/Continue cardiac monitor.
- Continuous SpO2 as per Oxygen Therapy Protocol. ***(159.208)***
- Respiratory failure, see advanced airway protocol. ***(159.201)***
- Occlusive dressing taped on three sides for open chest wounds.
- Treat Hypotension as per Shock Protocol ***(159.417)***
- Treat pain as per Pain Protocol ***(159.405)***

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.704**
	TITLE: EYE INJURIES	**Effective Date 11/01/2021**

Classification of Transport: ALS

BLS CARE:

- BLS primary survey.
- Apply soft bulky dressing to the affected eye.
- Head of bed at 30 degrees.
- Assess for contact lens.
- If avulsed eye or impacted object in eye cover with cup or protective device.
- Do not attempt to remove any foreign body from the eye.

ALS CARE:

- Obtain IV access.
- Treat Pain as per Protocol ***(159.405)***

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.705A**
	TITLE: HEAD TRAUMA/INCREASED ICP	**Effective Date 11/1/2022**

Classification of Transport: ALS

BLS CARE:

- BLS primary survey.
- Spinal Motion Restriction (SMR). **(159.707)**
- Document initial Glasgow Coma Scale (GCS).
- Oxygen administration per oxygen therapy protocol. **(159.208)**
- Check blood glucose level (BGL).

ALS CARE:

- Airway Management per Advanced Airway Protocol**. (159.201)**
- Establish/Continue cardiac monitor.
- Hypotension with systolic BP less than 100 mm/Hg or MAP less than 65 mm/Hg administer Normal Saline at 250 mL bolus IV may repeat up to total 2000mL. **(159.417)**
- Control External Hemorrhage. **(159.708)**
- Treat seizures, see seizure protocol. **(159.416)**
- Monitor for signs of increased intracranial pressure including but not limited to: decreasing Glasgow Coma Scale of two or more points, development of a sluggish or nonreactive pupil, development of hemiplegia, hemiparesis, or Cushing's phenomenon.
- If Patient Hypertensive (Systolic 220 mm/hg, Diastolic 120 mm/hg), then refer to Hypertensive Emergency Protocol **(159.412)**
- Elevate head of bed 30^{o} if no spinal trauma present.
- Consider Hypertonic Saline for Increased ICP, Altered Mental Status, or Herniation Syndrome/Cushing's Syndrome (Bradycardic/Hypertensive/Altered Respirations), Cranial Nerve Dysfunction (CN III-Unequal Pupils).

3% HYPERTONIC SALINE 1 to 5 mL/kg, max 250 mL, over 20 minutes for increased ICP. **(159.853)**

Contact Medical Control

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.706**
	TITLE: MUSCULOSKELETAL INJURIES	**Effective Date 11/01/2021**

Classification of Transport: BLS if narcotic pain management is not required.

BLS CARE:

- BLS primary survey.
- Oxygen administration per oxygen therapy protocol. ***(159.208)***
- Remove all clothing and jewelry surrounding the injury.
- Visually assess for laceration, hematomas, capillary refill time.
- Apply direct pressure to all bleeding.
- Palpate for temperature, pulses, and crepitus.
- Test for sensation.
- Immobilize all suspected fractures.
- Check pluses, movement, and sensation, before and after all splinting.
- Vital signs
- Apply traction splint to mid-shaft, femur fractures as clinically indicated.

ALS CARE:

- Treat Pain as per Pain Protocol ***(159.405)***
- Treat Hypotension per Shock Protocol ***(159.417)***

RICHMOND AGITATED SEDATION SCALE

Score	Term	Description
+4	Combative	Overtly combative or violent and an immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert but has sustained (> 10 seconds) awakenings, with eye contact, to voice
-2	Light sedation	Briefly (< 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimuli
-5	Unarousable	No response to voice or physical stimulation

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.707**
	TITLE: SPINAL MOTION RESTRICTION (SMR)	**Effective Date 11/01/2021**

Long spine boards have been in our ambulances for decades and were never meant for body splints. The backboard is an extrication tool to pick up and move patients. Somewhere in our history it turned into a body splint. This has been studied, researched, and changed globally. A joint position statement was published in 2018, which was an important step forward to change the EMS Dogma of spinal immobilization.

Peter E. Fischer, PE, etal. "Spinal Motion Restriction in the Trauma Patient – A Joint Position Statement" Prehospital Emergency Care, 2018 (22):6:659-661.

Since then, many papers have been written to support these conclusions. One more quick visualization to help cement this concept: the stretcher cot is flat and ridged, the cot mattress fills and evenly supports the body's contours and with cot straps, limits spinal movement, ie spinal motion restriction protocols. We are almost ready to stop the widespread, empiric C-Collaring of our patients, but for now, use a backboard only to lift and move a patient, as needed.

Classification of Transport: ALS

BLS CARE:

- BLS primary survey
- Oxygen administration per oxygen therapy protocol. ***(159.208)***
- Assess patients for indications of Spinal Motion Restriction. Spinal Motion Restriction (SMR) should be considered for the following ***BLUNT TRAUMA*** scenarios: (No role for SMR in PENETRATING TRAUMA)
    - Acutely altered level of consciousness (e.g., GCS<15, evidence of intoxication)
    - Midline neck or back pain and/or tenderness
    - Focal neurologic signs and/or symptoms (e.g., numbness or motor weakness)
    - Anatomic deformity of the spine
    - Distracting circumstances or injury (e.g., long bone fracture, degloving, or crush injuries, large burns, emotional distress, communication barrier, etc.) or any similar injury that impairs the patient's ability to contribute to a reliable examination
- SMR consists of an appropriately sized C-Collar and patient placement on the Ambulance Cot with tight fitting stretcher straps. Patients are to be secured to the EMS Cot in the usual fashion, limiting spinal movement.
    - Use of a Slide Board for lateral side to side movements.
    - Log-Roll Precautions (no bending of the spine)
    - Manual C-Spine precautions (holding a patient's head in the neutral position for patient movements).

  - Use of a Backboard, slide board, SKED, Scoop etc. can be utilized to move a patient.
  - Consider Elevation Head of the Bed to 30 degrees unless specifically ordered to be flat or patient request for comfort to be flat. (Pt to bend at the hip joint, this slightly increases axial loading pressure of the spine, so if strict log roll precautions are in place this mandates a patient to be flat. Strict airway monitoring is required when flat.)
- At no time should any patient spend a prolonged period of time on a long spine board, including any EMS transport. Remove the moving device (Backboard, scoop, SKED etc) and position patients on the ambulance cot prior to transport.
- If presented with a patient immobilized on a back board, from the sending facility, request the patient to be removed from the back board ASAP. No one should be transported on a back board. Call Medical Direction, as needed, if sending team will not remove the backboard.

ALS CARE:

- Obtain IV access.
- Establish/continue cardiac monitoring, SpO2, waveform capnography.
- Manage pain, nausea, anxiety, shock, and any other condition as per the appropriate protocol.

Contact Medical Direction, as needed

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.708**
	TITLE: HEMORRHAGE CONTROL	**Effective Date 11/01/2021**

Classification of Transport: BLS

BLS CARE:

- BLS primary survey
- Oxygen administration per oxygen therapy protocol. ***(159.208)***
- Apply direct pressure / pressure dressing / hemostatic dressing to the injury.
- If direct pressure ineffective or impractical and hemorrhage not controlled **(159.922)**:
  - Apply Combat Application Tourniquet (C.A.T.) at least 3 inches above the wound, not over a joint. In an unstable scene, or if the extent of the wound cannot be fully assessed in the field, tourniquet should be placed as proximal on limb as high and tight as possible.
  - Tighten C.A.T. tourniquet until bright red bleeding has stopped.
  - Secure C.A.T. tourniquet in place and expedite transport to appropriate receiving facility.
  - Notify Receiving facility of location of C.A.T. tourniquet and time of application
  - For bleeding wounds where it is impossible to place a tourniquet, i.e. junctional wounds, pack wound with combat gauze or hemostatic dressing.

ALS CARE:

- Obtain IV access.
- Establish / Continue cardiac monitoring.
- For Hypotension, treat per Shock Protocol ***(159.417)***
- For bleeding neck wounds, where there is possible airway compromise, consider early intubation early to secure airway. Pack wound with hemostatic dressing.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.800**
	AUTHORIZED MEDICATION GUIDELINES INTRODUCTION	**Effective Date 11/01/2021**

The following pages contain guidelines for the medications commonly encountered by the AdventHealth EMS Department Paramedic. The medications listed are identified by the name and class of the drug, a short description, indications, contraindications, precautions, and dosages. Certain medications listed have various dosages depending on the patient's condition. Refer to the appropriate protocol guidelines or contact Medical Control for specific dosage information.

All IV piggyback medications must be placed on a micro-drip solution set for field administration and if available, an infusion pump or dial-a-flow must be utilized.

All Pediatric medications when possible shall be placed on a syringe pump or IV pump for controlled administration using the pre-programmed medication administration information library as a safety measure.

The following medications are authorized to be administered by AdventHealth EMS EMT's, Paramedics, Critical Care Paramedics, Registered Respiratory Therapists, and/or Registered Nurses:

Adenosine	Albuterol	Amiodarone
Aspirin	Atropine Sulfate	Atrovent
Calcium Chloride	Calcium Gluconate	Diphenhydramine
Dextrose 50%	Diltiazem	Dopamine
Epinephrine	Esmolol	Famotidine
Fentanyl	Furosemide	Ziprasidone
Glucagon	Glucose-Oral	Haloperidol
Labetalol	Lorazepam	Magnesium Sulfate
Methylprednisolone	Metoprolol	Midazolam
Morphine Sulfate	Naloxone	Nicardipine
Nitroglycerin	Norepinephrine	Ondansetron
Oxygen	Racemic Epinephrine	Sodium Bicarbonate
Etomidate	Succinylcholine	Vecuronium
Ketamine	0.9% NaCl-Normal Saline	Acetaminophen
Ketorlac	Ibuprofen	Rocuronium

DESCRIPTION:

- It is a natural occurring agent that can "chemically cardiovert" PSVT to a normal sinus rhythm. It has a half life of 5 – 10 seconds and does not cause hypotension like Verapamil.

INDICATIONS:

- PSVT (rate > 150)
- Wide-complex tachycardia (rate >150), stable and SVT highly likely

CONTRAINDICATIONS:

- 2nd and 3rd Degree Heart Block, Sick Sinus Syndrome, or known hypersensitivity to the medication.

PRECAUTIONS:

- It may cause bronchospasm in asthma patients. Heart transplant patients may only require a smaller dosage and patients on Theophylline based medications may require larger dosage, contact Medical Control for consult.

DESCRIPTION:

- It is a synthetic sympathomimetic that causes bronchodilation with less cardiac effect than Epinephrine. The duration of effect is about four hours.

INDICATIONS:

- Acute Asthma, COPD with wheezing, Allergic Reactions.

CONTRAINDICATIONS:

- Hypersensitivity to the medication.

PRECAUTIONS:

- The patient may experience palpitations, anxiety, nausea, and/or dizziness. Vital signs must be monitored; use caution with cardiac or hypertensive patients.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.803**
	AUTHORIZED MEDICATION GUIDELINES **amiodarone** (Cordarone, Pacerone) **(50 mg/mL)**	**Effective Date 08/01/2020**

DESCRIPTION:

- Amiodarone is considered a class III antiarrhythmic. It possesses electrophysiological characteristics of sodium, potassium and calcium channel blockade, as well as alpha and beta adrenergic blocking activity. These properties prolong action potentials and repolarization, stabilizing myocardial membranes.

INDICATIONS:

- Ventricular fibrillation / pulseless ventricular tachycardia
- Ventricular tachycardia without overt signs of shock (SBP > 100)
- Wide complex tachycardia of unknown etiology
- Pediatric ventricular fibrillation / pulseless ventricular tachycardia

CONTRAINDICATIONS:

- Cardiogenic shock, Marked sinus bradycardia, Second or third degree AV block, Known hypersensitivity

PRECAUTIONS:

- Solution is extremely viscous, Do Not Shake
- Administer the medication slowly
- Use large bore filtered needles, or needless filter straws

SIDE EFFECTS/ ADVERSE REACTIONS:

- Hypotension, Bradycardia

Adverse effects can be treated by the following:

- Slow the rate of drug infusion
- IVF bolus, pressors, chronotropic agents, or temporary pacing

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.804**
	AUTHORIZED MEDICATION GUIDELINES **Aspirin (ASA) / Anti-inflammatory platelet aggregation inhibitor**	**Effective Date 08/01/2020**

DESCRIPTION:

- Commonly used over the counter analgesic with thrombolytic properties. The onset of action is 5-30 minutes, and the duration of action is 3-6 hours.

INDICATIONS:

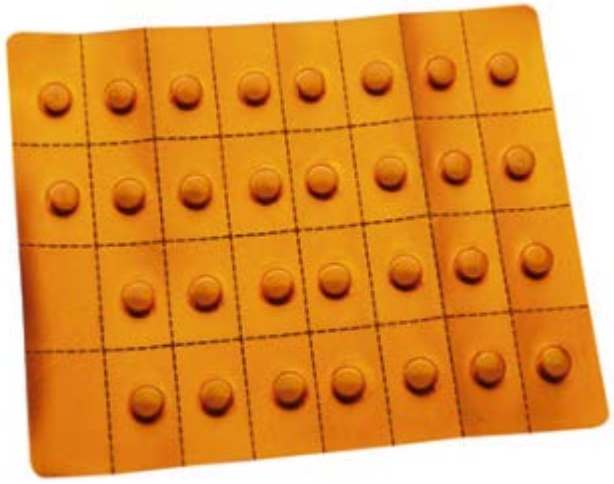
- New chest pain suggestive of acute MI.

CONTRAINDICATIONS

- Patients with known hypersensitivity to the drug, active ulcer disease, pregnant or a nursing mother.

PRECAUTIONS:

- GI bleeding and upset. Possible side effects: Heartburn, nausea and vomiting. Not recommended for Pediatric patients.



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.805**
	AUTHORIZED MEDICATION GUIDELINES **Atropine Sulfate / Antimuscarinics / Antidotes** **1 mg/10 mL (0.1 mg/mL) syringe**	**Effective Date 08/01/2020**

DESCRIPTION:

- Atropine is a potent anticholinergic. It inhibits muscarinic receptor activity in the parasympathetic sites in smooth muscle, central nervous system, cardiac and secretory tissue. This reduces vagal tone, increases automaticity of the SA node and increases AV conductions, thus increasing heart rate. Additional effects include drying secretions and slowing motility in the gastrointestinal tract.

INDICATIONS:

- Brady dysrhythmias (rate less than 50) accompanied by hemodynamic compromise, i.e. hypotension (systolic less than 100 mmHg), shock, pulmonary edema, altered level of consciousness
- Pediatric Bradycardia (HR less than 100 in an infant, HR less than 60 in a child) despite adequate oxygenation, ventilation, chest compressions, and refractory to epinephrine

CONTRAINDICATIONS:

- No effect is seen in Heart Transplant Patients
- 3rd degree AV block in the setting of an acute anterior wall MI

PRECAUTIONS:

- Administer IV push to prevent rebound bradycardia.
- Atropine is potentiated by antihistamines and antidepressants
- Cautious use in Type II AV block and 3rd degree block with wide QRS complexes

ADVERSE REACTIONS:

- Restlessness, Agitation, Confusion, Pupil dilation, Blurred vision, Headache, Increased myocardial, oxygen demand, Ventricular fibrillation, Dry mouth, Difficulty swallowing, Urinary retention

DESCRIPTION:

- Calcium is a cation that essential for neurotransmission, bone formation, enzymatic reactions and muscle (including cardiac) contraction. In the myocardium, it increases the force of contraction and augments cardiac output. Calcium also has a stabilizing effect on myocardial membranes when dangerously high potassium levels make the heart at risk for fibrillation.

INDICATIONS:

- Hyperkalemia with associated ECG changes
- Diagnosed Hypocalcemia
- Calcium channel blocker toxicity / overdose with hemodynamic compromise
- Magnesium toxicity

CONTRAINDICATIONS:

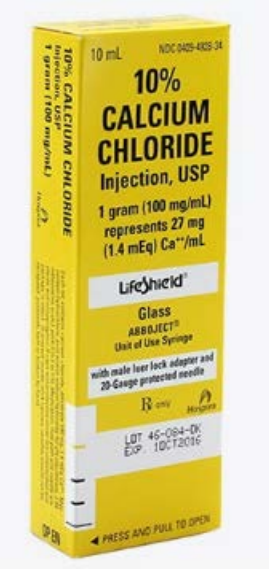
- Cardiac arrest not associated with one of the above etiologies
- Digoxin toxicity
- Hypercalcemia

PRECAUTIONS:

- Cautious use in patients receiving Digoxin - do not administer to patients with suspected Digoxin toxicity / overdose
- Do not mix with sodium bicarbonate

ADVERSE REACTIONS:

- Bradycardia – Caused by rapid infusion
- Arrhythmias – Seen in patients on Digoxin
- Sclerosis / Necrosis of veins - Due to infiltration (Use Central Line or Large Vein to reduce irritation)



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.807**
	AUTHORIZED MEDICATION GUIDELINES **Calcium Gluconate /Electrolyte**	**Effective Date 08/01/2020**

DESCRIPTION:

- Calcium is a cation that essential for neurotransmission, bone formation, enzymatic reactions and muscle (including cardiac) contraction. In the myocardium, it increases the force of contraction and augments cardiac output. Calcium also has a stabilizing effect on myocardial membranes when dangerously high potassium levels make the heart at risk for fibrillation.

INDICATIONS:

- Hyperkalemia with associated ECG changes
- Diagnosed Hypocalcemia
- Calcium channel blocker toxicity / overdose with hemodynamic compromise
- Magnesium toxicity

CONTRAINDICATIONS:

- Cardiac arrest not associated with one of the above etiologies
- Digoxin toxicity
- Hypercalcemia

PRECAUTIONS:

- Cautious use in patients receiving Digoxin - do not administer to patients with suspected Digoxin toxicity / overdose
- Do not mix with sodium bicarbonate

ADVERSE REACTIONS:

- Bradycardia – Caused by rapid infusion
- Arrhythmias – Seen in patients on Digoxin

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.808**
	AUTHORIZED MEDICATION GUIDELINES **Dextrose 50% (D 50 W) / Simple Sugar** **25 gm / 50 mL vial, syringe**	**Effective Date 08/01/2020**

DESCRIPTION:

- 50% Dextrose Injection, USP is a sterile, nonpyrogenic, hypertonic solution of dextrose in water for injection for intravenous injection as a fluid and nutrient replenisher. When administered intravenously this solution restores blood glucose levels in hypoglycemia and provides a source of carbohydrate calories.

INDICATIONS:

- Hypoglycemia
- Adult less than 50 mg/dL
- Pediatric less than 70 mg/dL
- AMS

CONTRAINDICATIONS:

- Stroke or acute brain injury with glucose greater than 70 mg/dL

PRECAUTIONS:

- D50 should not be used when intracranial or intra-spinal hemorrhage is present, nor in the presence of delirium tremens if the patient is already dehydrated.

ADVERSE REACTIONS:

- Thrombosis, sclerosing of veins if given peripherally
- Tissue irritation from infitration
- Hypokalemia

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.809**
	AUTHORIZED MEDICATION GUIDELINES **Diltiazem (CARDIZEM) / Calcium Channel Blocker/Antiarrhythmic**	**Effective Date 08/01/2020**

DESCRIPTION:

- Diltiazem is used to control rapid heartbeats or abnormal heart rhythms. It is a calcium channel blocking agent. Diltiazem affects the movement of calcium into the cells of the heart and blood vessels. As a result, the heart beats slower and the blood vessels relax thus, increasing the supply of blood and oxygen to the heart while reducing its workload.

INDICATIONS:

- Hypertension.
- Angina pectoris and vasospastic (Prinzmetal's) angina.
- Supraventricular tachyarrhythmias and rapid ventricular rates in atrial flutter or fibrillation.

CONTRAINDICATIONS:

- Hypersensitivity;
- Sick sinus syndrome;
- 2nd- or 3rd-degree AV block (unless an artificial pacemaker is in place);
- Systolic BP less than 90 mm Hg;
- Recent MI or pulmonary congestion;
- Concurrent use of rifampin.

PRECAUTIONS:

- Severe hepatic impairment (↓ dose recommended);
- Severe renal impairment;
- Serious ventricular arrhythmias or HF;

ADVERSE REACTIONS:

- Dizziness, Dyspnea, Anxiety, Arrhythmias, Tachycardia, Hypotension, Syncope, Nausea, Vomiting

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.810**
	AUTHORIZED MEDICATION GUIDELINES **Diphenhydramine (BENADRYL) / Antihistamine**	**Effective Date 08/01/2020**

DESCRIPTION:

- Inhibits the release of histamine, thereby reducing broncho-constriction and vasodilation.

INDICATIONS:

- Allergic reaction. Dystonic reactions to antipsychotics.

CONTRAINDICATIONS:

- Anaphylactic Shock

PRECAUTIONS:

- May induce hypotension, headache, Tachycardia, sedation, drowsiness, and /or disturbed coordination.
- Use with caution in patients with asthma and other lower respiratory diseases due to the potential for dyspnea.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.811**
	AUTHORIZED MEDICATION GUIDELINES **DOPamine** (Intropin) 400 mg/250 mL D5W premixed **bag** ******DOUBLE CHECK YOUR CONCENTRATION******	**Effective Date 08/01/2020**

DESCRIPTION:

- Treatment of hypotension, low cardiac output, poor perfusion of vital organs; used to increase mean arterial pressure in septic shock patients who remain hypotensive after adequate volume expansion

INDICATIONS:

- Hemodynamic imbalance due to MI
- Endotoxic septicemia
- Renal failure
- Chronic cardiac decompensation

CONTRAINDICATIONS:

- Do not mix with sodium bicarbonate.

PRECAUTIONS:

- Correct volume before beginning dopamine. Volume depletion can cause hypotension.
- Use cautiously in cardiogenic shock or congestive heart failure.
- Dopamine may cause tachycardia, tachyarrhythmia, and excess vasoconstriction.

ADVERSE REACTIONS:

- Dyspnea, Nausea, Vomiting, Headache, Anxiety, Intraocular pressure, Dilated Pupils

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.812**
	AUTHORIZED MEDICATION GUIDELINES **Epinephrine (ADRENALIN) / Sympathomimetic**	**Effective Date 08/01/2020**

DESCRIPTION:

- Epinephrine when given by rapid intravenous injection, produces a rapid rise in blood pressure, mainly systolic, by (1) direct stimulation of cardiac muscle which increases the strength of ventricular contraction, (2) increasing the heart rate and (3) constriction of the arterioles in the skin, mucosa and splanchnic areas of the circulation. Epinephrine is available in two concentrations (1:10,000 - (0.1mg/mL) & 1:1,000 – (1mg/mL))

INDICATIONS:

- Adjunctive use in the management of cardiac arrest

CONTRAINDICATIONS:

- Other than in the emergency situation, the following contraindications should be considered: hyperthyroidism, hypertension, ischemic heart disease, diabetes mellitus, closed angle glaucoma and hypersensitivity to sympathomimetic amines

PRECAUTIONS:

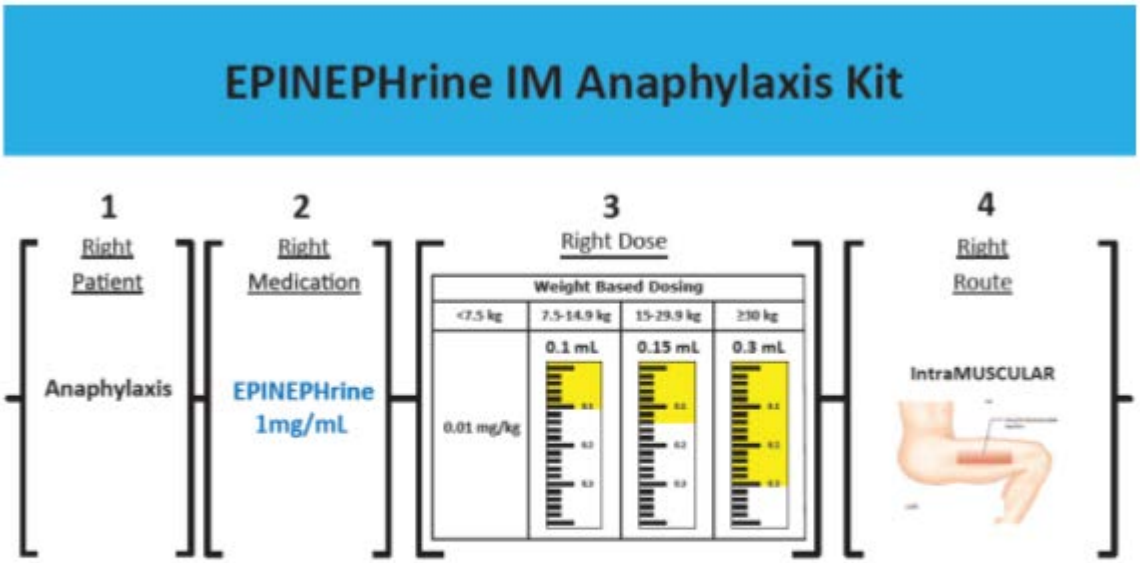
- Adrenaline crosses the placenta. There is some evidence of a slightly increased incidence of congenital abnormalities.

ADVERSE REACTIONS:

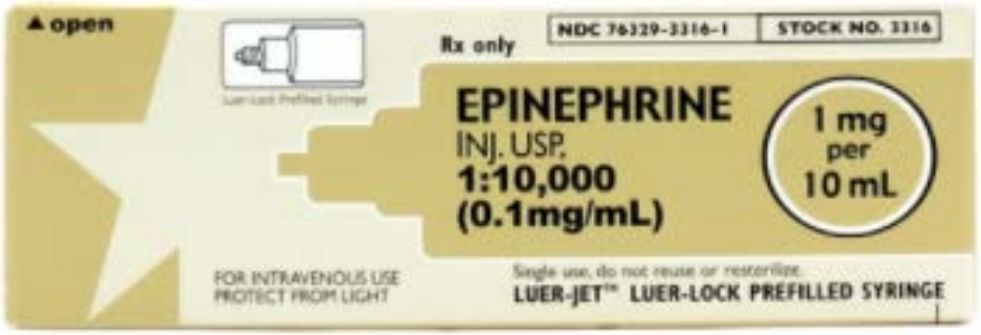
- Anxiety, Headache, Tremors, MI, V-Fib, Pallor, Weakness

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.812**
	AUTHORIZED MEDICATION GUIDELINES **Epinephrine (ADRENALIN) / Sympathomimetic**	**Effective Date 08/01/2020**

ANAPHYLAXIS:



EPINEPHrine IM Anaphylaxis Kit



AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.813**
	AUTHORIZED MEDICATION GUIDELINES **Esmolol (BreviBLOC)** **2.5 gm/10 mL (250 mg/mL) ampule** **2.5 gm/250 mL D5W premixed bag**	**Effective Date 08/01/2020**

DESCRIPTION:

- Esmolol hydrochloride is a beta1-selective (cardio selective) adrenergic receptor blocking agent with a very short duration of action (elimination half-life is approximately 9 minutes).

INDICATIONS:

- Thoracic Aneurysm
- Hypertension

CONTRAINDICATIONS:

- Sinus Bradycardia
- Second & Third Degree Heart Block
- Cardiogenic Shock

PRECAUTIONS:

- Infusion concentrations of 20 mg/mL were associated with more serious venous irritation
- Use caution with patients who have impaired renal function

ADVERSE REACTIONS:

- Symptomatic Hypotension
- Bradycardia
- Chest Pain
- Syncope
- Heart Block

DESCRIPTION:

- Inhibits the action of histamine at the H_2-receptor site located primarily in gastric parietal cells, resulting in inhibition of gastric acid secretion.

INDICATIONS:

- Treatment and prevention of heartburn, acid indigestion, and allergic reactions.

CONTRAINDICATIONS:

- Hypersensitivity; Cross-sensitivity may occur; Porphyria (ranitidine bismuth citrate only).

PRECAUTIONS:

- Renal impairment; Geriatric susceptible to adverse CNS reactions; Pregnancy or lactation.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.815**
	AUTHORIZED MEDICATION GUIDELINES **Fentanyl** (Sublimaze) 100 mcg/2 mL vial 250 mcg/5 mL vial	**Effective Date 08/01/2020**

DESCRIPTION:

- Fentanyl is a potent, synthetic opioid pain medication with a rapid onset and short duration of action. Fentanyl is 50 to 100 times more potent than morphine

INDICATIONS:

- Fentanyl citrate is a narcotic analgesic. In low doses, it is used to provide analgesia during short surgical procedures and as a premedicant. In higher doses, it is employed as an analgesic/respiratory depressant in patients who need assisted ventilation. In combination with a neuroleptic drug, fentanyl is employed as part of the technique of neurolept analgesia. Fentanyl is also used in the treatment of severe pain, such as that of myocardial infarction.

CONTRAIDICATIONS:

- Respiratory Depression, Obstructive Airway Disease

PRECAUTIONS:

- Fentanyl should be given only in an environment where the airway can be controlled and by personnel who can control the airway.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.816**
	AUTHORIZED MEDICATION GUIDELINES **Furosemide (LASIX) / Diuretic**	**Effective Date 08/01/2020**

DESCRIPTION:

- It is a potent diuretic that inhibits sodium re-absorption by the kidney. Water is eliminated with the sodium. Its effects are noted within 5 minutes.

INDICATIONS:

- Rales from Pulmonary Edema.

CONTRAINDICATIONS

- Pregnancy (except in life-threatening circumstances), Hypotension, or rales from pneumonia.

PRECAUTIONS

- Severe hypotension, dehydration, and electrolyte depletion may result from excessive doses of Furosemide, especially in patients with pneumonia. Must be protected from light.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.817**
	TITLE: ZIPRASIDONE (GEODON)	**Effective Date 08/01/2020**

DESCRIPTION:

- **ZIPRASIDONE (GEODON)** is an antipsychotic medication. It works by changing the effects of chemicals in the brain. It is used to treat schizophrenia and the manic symptoms of bipolar disorder (manic depression).

INDICATION:

- **ZIPRASIDONE (GEODON)** is indicated for the treatment of schizophrenia, as monotherapy for the acute treatment of bipolar manic or mixed episodes, and as an adjunct to lithium or valproate for the maintenance treatment of bipolar disorder. **ZIPRASIDONE (GEODON)** intramuscular is indicated for acute agitation in schizophrenic patients.

CONTRAINDICATIONS:

- Because of **ZIPRASIDONE (GEODON)** dose-related prolongation of the QT interval and the known association of fatal arrhythmias with QT prolongation by some other drugs, **ZIPRASIDONE (GEODON)** is contraindicated:
    - in patients with a known history of QT prolongation (including congenital long QT syndrome)
    - in patients with recent acute myocardial infarction
    - in patients with uncompensated heart failure

DESCRIPTION:

- Raises blood glucose level by promoting catalytic depolymerization of hepatic glycogen to glucose.
- Onset of action is 8 - 10 minutes.

INDICATIONS:

- Hypoglycemia in the absence of IV access, Beta Blocker overdose

CONTRAINDICATIONS:

- Hypersensitivity to the medication, Pheochromocytoma.

PRECAUTIONS:

- Unstable hypoglycemic diabetics may not respond to Glucagon. Has a positive inotropic and chronotropic action on the heart.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.819**
	AUTHORIZED MEDICATION GUIDELINES **Glucose - Oral**	**Effective Date 08/01/2020**

DESCRIPTION:

- Glucose gel is a monosaccharide (simple sugar). It works by quickly raising the glucose level in the blood.
- Onset of action is 8 - 10 minutes.

INDICATIONS:

- Hypoglycemia in the absence of IV access.

CONTRAINDICATIONS:

- Hypersensitivity to any ingredient in the medication
- Pt unable to swallow
- GCS less than 15

DESCRIPTION:

- A potent, long-acting antipsychotic agent with pharmacologic actions similar to those of the phenothiazines but with a higher incidence of extrapyramidal effects and less hypotensive and relatively low sedative activity.

INDICATIONS:

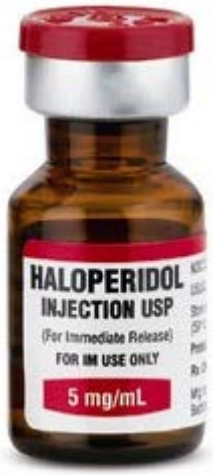
- To manage acute psychotic disorders.

CONTRAINDICATIONS:

- Parkinson's disease, Parkinsonism, seizure disorders, coma, alcoholism, severe mental depression, CNS depression, thyrotoxicosis.

PRECAUTIONS:

- Do not administer if other sedatives have been given. Use with caution in elderly or debilitated patients or those with urinary retention, glaucoma, severe cardiovascular disorders; in patients receiving anticonvulsant, or lithium therapy.



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.821**
	AUTHORIZED MEDICATION GUIDELINES **Ipratropium (ATROVENT) / Bronchodilator**	**Effective Date 08/01/2020**

DESCRIPTION:

- Inhibits interaction of acetylcholine at receptor sites on the bronchial smooth muscle, resulting in decreased GMP and bronchodilation.

INDICATIONS:

- For the treatment of bronchospasm associated with chronic pulmonary disease, including asthma, bronchitis, and emphysema.

CONTRAINDICATIONS:

- Hypersensitivity to **IPRATROPIUM**, or to **ATROPINE** and its derivatives. Not for use in CHF or cardiac asthma.

PRECAUTIONS;

- Use with caution in patients with narrow angle glaucoma, prostatic hypertrophy or bladder neck obstruction.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.822**
	AUTHORIZED MEDICATION GUIDELINES **Labetalol (NORMODYNE)** **Beta Blocker/Antihypertensive**	**Effective Date 08/01/2020**

DESCRIPTION:

- It is an adrenergic-receptor blocking agent with alpha and beta-adrenergic blocking actions.

INDICATION:

- To manage an acute hypertensive crisis.

CONTRAINDICATIONS:

- Bronchial asthma, uncontrolled cardiac failure, heart block (greater than first degree), cardiogenic shock, and severe bradycardia.

PRECAUTIONS:

- COPD, heart failure; pheochromocytoma, impaired hepatic function, jaundice, diabetes mellitus, peripheral vascular disease.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.823**
	AUTHORIZED MEDICATION GUIDELINES **Lorazepam (ATIVAN) /Anticonvulsant/ Sedative** **4 mg / 1 mL**	**Effective Date 08/01/2020**

DESCRIPTION:

- **ATIVAN** is used to treat status epilepticus. It is also used before surgeries or procedures to cause drowsiness and decrease anxiety.

INDICATIONS:

- Acute Anxiety
- Acute Mania
- Status Epilepticus

CONTRAINDICATIONS:

- Acute Respiratory Insufficiency, Sleep Apnea, Severe Hepatic Insufficiency

PRECAUTIONS:

- Monitor respiration and level of sedation; ensure availability of resuscitative equipment for ventilatory support.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.824**
	AUTHORIZED MEDICATION GUIDELINES **Magnesium Sulfate / Electrolyte** **20 gm / 500 mL premix** **1 gm / 2 mL; 25 gm / 50 mL vial**	**Effective Date 08/01/2020**

DESCRIPTION:

- It is a potent diuretic that inhibits sodium re-absorption by the kidney. Water is eliminated with the sodium. Its effects are noted within 5 minutes.

INDICATIONS:

- Cardiac Arrest – Suspected Hypomagnesia
- Torsade de Pointes
- Eclampsia
- Diagnosed Hypomagnesia
- Asthma

CONTRAINDICATIONS

- Renal Insufficiency / Failure

PRECAUTIONS

- Avoid rapid infusion unless cardiac arrest.
- Use caution in patients with heart block, neuromuscular disease or myasthenia gravis
- Large doses may induce respiratory depression

DESCRIPTION:

- Anti-inflammatory that suppresses the immune response.

INDICATIONS:

- Severe anaphylaxis, Asthma/COPD

CONTRAINDICATIONS:

- Hypersensitivity to the medication

PRECAUTIONS:

- Must be reconstituted and used promptly. Onset of action 2-6 hrs.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.826**
	TITLE: AUTHORIZED MEDICATION GUIDELINES **METOCLOPRAMIDE (REGLAN)** 10 mg/2 mL (5 mg/mL) vial 50 mg/10 mL (5 mg/mL) vial	**Effective Date 08/01/2020**

DESCRIPTION:

- **METOCLOPRAMIDE (REGLAN)** is used to prevent the nausea and vomiting that may occur after surgery or after cancer treatment medications.

INDICATIONS:

- Nausea
- Vomiting

CONTRAINDICATIONS

- Epilepsy
- Parkinson's
- Use in Children less than 1 year of age.

PRECAUTIONS

- Extrapyramidal disorders may occur, particularly in children and young adults, and/or when high doses are used
- Symptoms of Parkinson's may be exacerbated by use

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.827**
	AUTHORIZED MEDICATION GUIDELINES **Metoprolol (LOPRESSOR)** **5 mg / 5 mL (1 mg / mL) vial**	**Effective Date 08/01/2020**

DESCRIPTION:

- Metoprolol tartrate is a beta1-selective (cardio selective) adrenergic receptor blocker. This preferential effect is not absolute, however, and at higher plasma concentrations, metoprolol tartrate also inhibits beta2-adrenoreceptors, chiefly located in the bronchial and vascular musculature.

INDICATIONS:

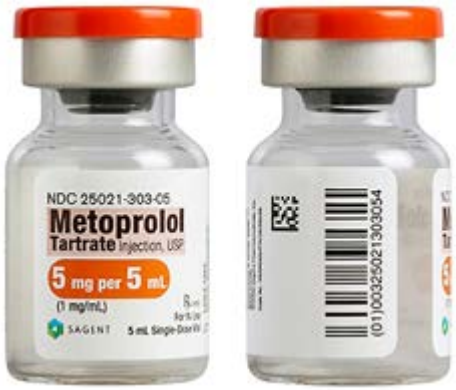
- Hypertension
- MI
- Thoracic Aneurysm

CONTRAINDICATIONS

- Significant 2nd or 3rd degree AV Block
- SBP less than 100mmHg
- HR less than 45 beats/min
- Moderate to severe cardiac failure

PRECAUTIONS

- CHF
- Monitor Rate and Rhythm; reduce or stop treatment if severe bradycardia develops
- Hepatic dysfunction
- Nursing Mothers



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.828**
	AUTHORIZED MEDICATION GUIDELINES **Midazolam (VERSED) / Sedative / Hypnotic** **10 mg/2 mL**	**Effective Date 08/01/2020**

DESCRIPTION:

- **MIDAZOLAM** is a benzodiazepine that can be used as a IV push or continuous IV infusion for sedation of intubated and mechanically ventilated patients and as a component of anesthesia or for sedation / amnesia.

INDICATIONS:

- Sedation for mechanically ventilated patients
- Sedation for transcutaneous paced patients

CONTRAINDICATIONS

- Intoxication
- Hypotension
- Respiratory insufficiency

PRECAUTIONS

- Rapid infusion may cause hypotension and/or respiratory depression/arrest

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.829**
	AUTHORIZED MEDICATION GUIDELINES **Morphine Sulfate / Opiate Agonists** **10 mg/1 mL vial**	**Effective Date 08/01/2020**

DESCRIPTION:

- **MORPHINE** is an opiate pain medication which is found naturally in a number of plants and animals. It acts directly on the central nervous system to decrease the feeling of pain. It can be administered for both acute and chronic pain.

INDICATIONS:

- Treatment of pain (Acute and Chronic)

CONTRAINDICATIONS

- Hypersensitivity
- Significant Respiratory Depression

PRECAUTIONS

- Monitor vital signs, especially respiratory rate.
- Keep oxygen, resuscitative equipment and naloxone available.
- Used with extreme caution in patients with head injuries.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.830**
	AUTHORIZED MEDICATION GUIDELINES **Naloxone (NARCAN) / Antagonist** **2 mg/2 mL (1mg/mL) ampule**	**Effective Date 08/01/2020**

DESCRIPTION:

- **NALOXONE** is a competitive narcotic antagonist used in the management and reversal of overdoses caused by narcotics and synthetic narcotic agents

INDICATIONS:

- Complete or partial reversal of CNS and respiratory depression induced by opioids.

CONTRAINDICATIONS

- Hypersensitivity
- Use with caution in narcotic dependent patients who may experience extreme withdrawal syndrome

PRECAUTIONS

- Some adverse reactions include: Tachycardia, HTN, Dysrhythmias, Nausea/Vomiting and Diaphoresis

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.831**
	AUTHORIZED MEDICATION GUIDELINES **Nicardipine (Cardene)** **25 mg/10 mL (2.5 mg/mL) ampule** **20 mg/200 mL premix** **40 mg/200 mL premix**	**Effective Date 08/01/2020**

DESCRIPTION:

- **Nicardipine** is a calcium channel blocker, Indicated for the short-term treatment of hypertension.

INDICATIONS:

- Recommended for use in patients with acute severe hypertension post intracranial hemorrhage or stroke.
- Patients with increases in SVR and decreased inotropic activity who need rapid blood pressure reduction that have failed or not tolerant of Hydralazine, Beta-blockers, Nitroprusside, Nitroglycerin, and ACE inhibitors.

CONTRAINDICATIONS

- Allergy to Calcium Channel Blockers

PRECAUTIONS

- Monitor vital signs, especially B/P
- Titrate slowly

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.832**
	AUTHORIZED MEDICATION GUIDELINES **Nitroglycerin Drip (TRIDIL) / Antianginal** **50 mg/ 250 mL D5W (200 mcg/mL) premix** *****DOUBLE CHECK YOUR CONCENTRATION*****	**Effective Date 08/01/2020**

DESCRIPTION:

- **NITROGLYCERIN** relaxes the vascular smooth muscle and consequently dilates the peripheral arteries and veins. Dilatation of the veins promotes peripheral pooling of blood and decreases venous return to the heart, thereby reducing left ventricular end-diastolic pressure and preload. Arteriolar relaxation reduces systemic vascular resistance, systolic arterial pressure, and mean arterial pressure (afterload). Dilatation of the coronary arteries also occurs.

INDICATIONS:

- **NITROGLYCERIN** is indicated for treatment of peri-operative hypertension; for control of congestive heart failure in the setting of acute myocardial infarction; for treatment of angina pectoris in patients who have not responded to sublingual Nitroglycerin and ß-blockers; and for induction of intraoperative hypotension

CONTRAINDICATIONS

- Allergy to **NITROGLYCERIN**
- Known allergy to corn or corn products
- Recent use of erectile dysfunction drugs

PRECAUTIONS

- Monitor vital signs, especially blood pressure.
- Hypotension induced by Nitroglycerin may be accompanied by paradoxical bradycardia and increased angina.

DESCRIPTION:

- **NITROGLYCERIN** relaxes the vascular smooth muscle and consequently dilates the peripheral arteries and veins. Dilatation of the veins promotes peripheral pooling of blood and decreases venous return to the heart, thereby reducing left ventricular end-diastolic pressure and preload. Arteriolar relaxation reduces systemic vascular resistance, systolic arterial pressure, and mean arterial pressure (afterload). Dilatation of the coronary arteries also occurs.

INDICATIONS:

- Chest pain associated with Angina Pectoris and Myocardial Infarction, Acute Pulmonary Edema.

CONTRAINDICATIONS:

- Increased intracranial pressure. Hypersensitivity to the medication. Systolic BP less than 100 mm/Hg.

PRECAUTIONS:

- Monitor vital signs, especially blood pressure.
- Hypotension induced by nitroglycerin may be accompanied by paradoxical bradycardia and increased angina.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.834**
	AUTHORIZED MEDICATION GUIDELINES **Norepinephrine (Levophed) 4 mg/4 mL (1 mg/mL) ampule**	**Effective Date 08/01/2020**

DESCRIPTION:

- **NOREPINEPHRINE** functions as a peripheral vasoconstrictor (alpha-adrenergic action) and as an inotropic stimulator of the heart and dilator of coronary arteries (beta-adrenergic action).

INDICATIONS:

- As an adjunct in the treatment of cardiac arrest and profound hypotension

CONTRAINDICATIONS

- Not indicated for patients who are hypotensive from blood volume deficits except as an emergency measure
- Should not be given to patients with mesenteric or peripheral vascular thrombosis

PRECAUTIONS

- Avoid hypertension
- Administer through large bore vein – central line preferred
- Avoid extravasation, may cause tissue sloughing or necrosis. **REGITINE** is the antidote.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.835**
	AUTHORIZED MEDICATION GUIDELINES **Ondansetron (ZOFRAN)** **4 mg/2 mL single dose vial**	**Effective Date 11/01/2021**

DESCRIPTION:

- **Ondansetron** (**ZOFRAN)** is a selective blocking agent of the serotonin 5-HT3 receptor type and blocks the actions of chemicals in the body that can trigger nausea and vomiting.

INDICATIONS:

- Prevention of nausea and vomiting

CONTRAINDICATIONS

- QT Prolongation
- Hypersensitivity

PRECAUTIONS

- Patients with liver disease
- Electrolyte imbalance
- CHF

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.836**
	AUTHORIZED MEDICATION GUIDELINES **Oxygen**	**Effective Date 08/01/2020**

DESCRIPTION:

- An odorless, colorless, tasteless gas that is essential for life. It is one of the most important emergency medications.

INDICATIONS:

- Hypoxia or anticipated hypoxia, cardiac arrest, chest pain, dyspnea, shock or anticipated shock.

CONTRAINDICATIONS:

- COPD use caution with high-flow Oxygen however, if patient is in distress, do not withhold.

PRECAUTIONS:

- COPD and prolonged administration of high concentrations in the newborn.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.837**
	AUTHORIZED MEDICATION GUIDELINES **Propofol (Diprivan)** **1000 mg/100 mL vial**	**Effective Date 08/01/2020**

DESCRIPTION:

- **PROPOFOL** is an intravenous, non-barbiturate anesthetic used for induction and maintenance of anesthesia and sedation of mechanically ventilated adult patients in the intensive care unit.

INDICATIONS:

- Anesthesia clinically indicated
- Sedation of mechanically ventilated adult patients

CONTRAINDICATIONS:

- Hypersensitivity
- Egg Allergy

PRECAUTIONS

- Hepatic Impairment
- Renal Impairment

SPECIAL CONSIDERATIONS:

RASS sedation level of -4 to -5, or as ordered.
Recommended infusion is 20-40 mcg/kg/minute
(For doses greater than 50 mcg/kg/minute notify physician and consider other agents).

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.838**
	AUTHORIZED MEDICATION GUIDELINES **RACEMIC EPINEPHRINE** **2.25% - 0.5 mg/3 mL Solution / Single dose**	**Effective Date 08/01/2020**

DESCRIPTION:

- **RACEMIC EPINEPHRINE**. A mixture of dextro and levo-isomers of **EPINEPHRINE** that, when nebulized, can be used in the treatment of croup and bronchiolitis.

INDICATIONS:

- Croup in Children (Moderate to Severe)
- Asthma in Adults and Children
- RSV
- After extubation to reduce irritation and stridor

CONTRAINDICATIONS

- Should not be used in management of epiglottitis
- Hypersensitivity

PRECAUTIONS

- Closely monitor Vital signs particularly heart rate
- Palpitations, headache, anxiety and tachycardia are normal findings after administration

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.839**
	AUTHORIZED MEDICATION GUIDELINES **Sodium Bicarbonate (NaHCO3) / Electrolyte** **8.4% (1 mEq/mL) 10 mL and 50mL syringe**	**Effective Date 08/01/2020**

DESCRIPTION:

- **SODIUM BICARBONATE**, is indicated in the treatment of metabolic acidosis which may occur in severe renal disease, uncontrolled diabetes, circulatory insufficiency due to shock or severe dehydration, extracorporeal circulation of blood, cardiac arrest and severe primary lactic acidosis.

INDICATIONS:

- Cardiac Arrest
- Severe Renal Disease
- Lactic Acidosis

CONTRAINDICATIONS

- Hypocalcemia
- Respiratory Alkalosis

PRECAUTIONS

- Renal Insufficiency
- CHF

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.840**
	AUTHORIZED MEDICATION GUIDELINES **Vecuronium (Norcuron)** ***1mg/ml when Reconstituted***	**Effective Date 08/01/2020**

PARALYZING AGENT – CAUSES RESPIRATORY ARREST - MUST BE ON VENTILATOR-CONTROLLED-BREATH MODES

DESCRIPTION:

- **VECURONIUM BROMIDE**, is a nondepolarizing neuromuscular blocking agent possessing all of the characteristic pharmacological actions of this class of drugs (curariform). It acts by competing for cholinergic receptors at the motor end-plate. **VECURONIUM BROMIDE** is about 33% more potent than **PANCURONIUM**; the duration of neuromuscular blockade produced by **VECURONIUM BROMIDE** is shorter than that of **PANCURONIUM** at initially equipotent doses. The time to onset of paralysis decreases and the duration of maximum effect increases with increasing **VECURONIUM BROMIDE** doses.

INDICATIONS:

- Indicated as an adjunct to general anesthesia, to facilitate endotracheal intubation and to provide skeletal muscle relaxation during mechanical ventilation.

CONTRAINDICATIONS:

- Known Hypersensitivity

PRECAUTIONS:

- CHF, Asthmatic Patients
- Renal Insufficiency
- Reduced Circulatory Time
- Malignant Hyperthermia
- Severe Obesity

COMPATIBILITY:

- **SODIUM CHLORIDE** Injection 0.9%
- **DEXTROSE** Injection 5%
- Sterile Water for Injection

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.841**
	AUTHORIZED MEDICATION GUIDELINES Ketamine	**Effective Date 11/01/2021**

DESCRIPTION:

- **KETAMINE,** or **KETALAR** is a medication mainly used for starting and maintaining anesthesia. It induces a trance-like state while providing pain relief, sedation, and memory loss. Other uses include for chronic pain and for sedation in intensive care. Heart function, breathing, and airway reflexes generally remain functional during its effects. Effects typically begin within five minutes when given by injection with the main effects lasting up to 25 minutes.

INDICATIONS:

- Indicated as an adjunct to general anesthesia, to facilitate endotracheal intubation and to provide skeletal muscle relaxation during mechanical ventilation.

CONTRAINDICATIONS:

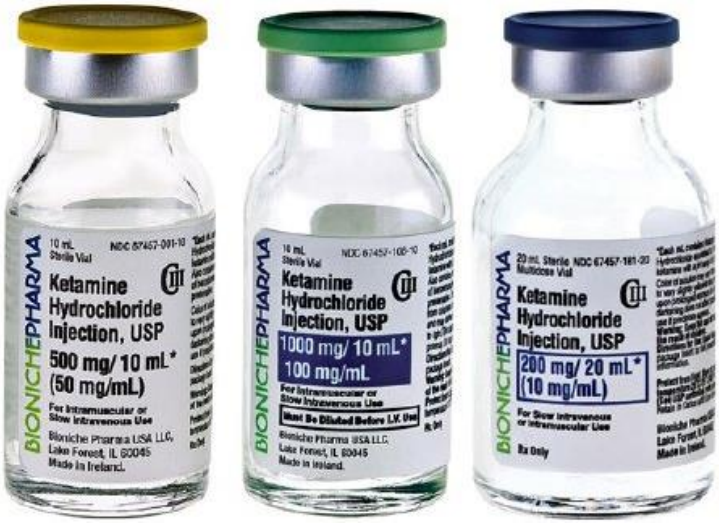
- Conditions worsened by an increase in blood pressure (ie. Angina, Stroke)
- Intraocular Pressure (**KETAMINE** is known to increase IOP)
- Penetrating eye injury

PRECAUTIONS:

- Monitor Airway closely post administration
- Monitor Blood Pressure and Heart Rate

COMPATIBILITY:

- **SODIUM CHLORIDE** Injection 0.9%



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.842**
	AUTHORIZED MEDICATION GUIDELINES Angiotensin II (Giapreza)	**Effective Date 11/01/2021**

DESCRIPTION:

- Angiotensin II is a vasoconstrictor, FDA approved in December 2017, that functions as part of the renin-angiotensin aldosterone system indicated to increase blood pressure in adults with septic or other distributive shock (most common type = sepsis)

INDICATIONS:

- Indicated as an adjunct for patients in Distributive Shock ONLY

CONTRAINDICATIONS:

- Allergy to mannitol, angiotensin II contains mannitol
- Cardiogenic shock
- ST Elevation Myocardial Infarction (STEMI)
- Aortic or abdominal aortic dissection
- Active bleeding and hemoglobin less than 7
- Active known clot
- VA-ECMO or on ECMO less than 12 hours
- Receiving treatment for bronchospastic symptoms, if not mechanically ventilated*
- Reynaud's Syndrome or vasospastic disease
- Liver failure with MELD score greater than 30
- Pregnant

PRECAUTIONS:

- Monitor Airway closely post administration
- Monitor Blood Pressure and Heart Rate

CONCENTRATION:

- 2.5mg vial in 250mL **NS** to a final concentration of 10,000 ng/ml

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.843**
	AUTHORIZED MEDICATION GUIDELINES Etomidate (Amidate)	**Effective Date 08/01/2020**

DESCRIPTION:

- **ETOMIDATE** is a short-acting intravenous anesthetic agent used for the induction of general anesthesia and sedation for short procedures such as reduction of dislocated joints, tracheal intubation, cardioversion and electroconvulsive therapy.

INDICATIONS:

- Used in the induction of general anesthesia.

CONTRAINDICATIONS:

- Sepsis
- Septic Shock

PRECAUTIONS:

- Monitor Airway closely post administration
- Monitor Blood Pressure and Heart Rate

CONCENTRATION:

- 40mg / 20mL
- 20mg / 10mL

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.844**
	AUTHORIZED MEDICATION GUIDELINES Succinylcholine	**Effective Date 11/01/2021**

DESCRIPTION:

- **SUCCINYLCHOLINE** is a skeletal muscle relaxant for intravenous (IV) administration indicated as an adjunct to general anesthesia, to facilitate tracheal intubation, and to provide skeletal muscle relaxation during surgery or mechanical ventilation.

INDICATIONS:

- **SUCCINYLCHOLINE**, is a medication used to cause short-term paralysis as part of general anesthesia. This is done to help with tracheal intubation.

CONTRAINDICATIONS:

- Recent Burns or Trauma within 24 to 72 hours
- Decreased Plasma Counts

PRECAUTIONS:

- Monitor Airway closely post administration
- Monitor Blood Pressure and Heart Rate

CONCENTRATION:

- 400mg / 20mL
- 200mg / 10mL

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.845**
	AUTHORIZED MEDICATION GUIDELINES PHENYLEPHERINE	**Effective Date 11/01/2021**

DESCRIPTION:

- **PHENYLEPHRINE** Hydrochloride Injection is indicated for the treatment of clinically important hypotension resulting primarily from vasodilation in the setting of anesthesia.
- **PHENYLEPHRINE** Hydrochloride Injection must be diluted before administration as an intravenous bolus or continuous intravenous infusion to achieve the desired concentration:

CONTRAINDICATIONS:

- None

PRECAUTIONS:

- Monitor Blood Pressure and Heart Rate

CONCENTRATION:

- 50mg / 5mL, 100mg / 10mL, 10mg / 1mL

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.846**
	AUTHORIZED MEDICATION GUIDELINES DOBUTAMINE (Dobutrex)	**Effective Date 11/01/2021**

DESCRIPTION:

- **DOBUTAMINE** stimulates heart muscle and improves blood flow by helping the heart pump better. **DOBUTAMINE** is used short-term to treat cardiac decompensation due to weakened heart muscle. **DOBUTAMINE** is usually given after other heart medicines have been tried without success.:

CONTRAINDICATIONS:

- Dobutamine hydrochloride is contraindicated in patients with idiopathic hypertrophic subaortic stenosis

PRECAUTIONS:

- Monitor Blood Pressure and Heart Rate

CONCENTRATION:

- 1 mg/mL-D5%; 12.5 mg/mL; 2 mg/mL-D5%; 4 mg/mL-D5%

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.847**
	AUTHORIZED MEDICATION GUIDELINES MILRINONE	**Effective Date 11/01/2021**

DESCRIPTION:

- **MILRINONE** lactate is a member of a new class of bipyridine inotropic/vasodilator agents with phosphodiesterase inhibitor activity, distinct from digitalis glycosides or catecholamines.
- **MILRINONE** is a positive inotrope and vasodilator, with little chronotropic activity different in structure and mode of action from either the digitalis glycosides or catecholamines.

CONTRAINDICATIONS:

- **MILRINONE** is contraindicated in patients who are hypersensitive to it.

PRECAUTIONS:

- Caution in patients with Heart Failure.

CONCENTRATION:

- 1 mg/mL

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.848**
	AUTHORIZED MEDICATION GUIDELINES ROCURONIUM BROMIDE	**Effective Date 11/01/2021**

DESCRIPTION:

- **ROCURONIUM** bromide (brand names **ZEMURON** , **ESMERON**) is an aminosteroid non-depolarizing neuromuscular blocker or muscle relaxant used in modern anaesthesia to facilitate tracheal intubation by providing skeletal muscle relaxation.

CONTRAINDICATIONS:

- Hypersensitivity
- Lack of ventilatory support, neuromuscular disease

PRECAUTIONS:

- Additive/synergistic effects if administered with or following an opioid, sedative or anesthetic agent

CONCENTRATION:

- 10 mg / mL

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.849**
	AUTHORIZED MEDICATION GUIDELINES NITROUS OXIDE	**Effective Date 11/01/2021**

DESCRIPTION:

- **NITROUS OXIDE** has significant medical uses, for its anaesthetic and pain reducing effects. Its colloquial name "laughing gas", coined by Humphry Davy, is due to the euphoric effects upon inhaling it, a property that has led to its recreational use as a dissociative anaesthetic.

CONTRAINDICATIONS:

- Vitamin B-12 deficiency, 1st Trimester Pregnancy

PRECAUTIONS:

- Additive/synergistic effects if administered with or following an opioid, sedative or anesthetic agent

CONCENTRATION:

- N/A

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.850**
	AUTHORIZED MEDICATION GUIDELINES FOSPHENYTOIN (CEREBYX)	**Effective Date 11/01/2021**

DESCRIPTION:

- **FOSPHENYTOIN** is an anticonvulsant that works by slowing down impulses in the brain that cause seizures.
- **FOSPHENYTOIN** is used to prevent or control seizures.

CONTRAINDICATIONS:

- Bradycardia, Heart Block, or Adams-Stokes syndrome

PRECAUTIONS:

- Caution with patients taking other anti-convulsant, low blood pressure, blood thinners.

CONCENTRATION:

- 10 mg/mL, 50 mg/mL

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.851**
	AUTHORIZED MEDICATION GUIDELINES KEPPRA (LEVETIRACETAM)	**Effective Date 11/01/2021**

DESCRIPTION:

- KEPPRA (levetiracetam) is a prescription medicine used to treat the symptoms of partial onset seizures, tonic-clonic seizures and myoclonic seizures. KEPPRA (levetiracetam) may be used alone or with other medications.

CONTRAINDICATIONS:

- **KEPPRA** is contraindicated in patients with a hypersensitivity to levetiracetam

PRECAUTIONS:

- Caution with patients taking other anti-convulsant, low blood pressure, blood thinners.

CONCENTRATION:

- 500 mg / 5 mL

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Medical Care*	**Protocol Number 159.852**
	AUTHORIZED MEDICATION GUIDELINES FLUMAZENIL (ROMAZICON)	**Effective Date 11/01/2021**

DESCRIPTION:

- Parenteral benzodiazepine antagonist
- Treats benzodiazepine overdose, reverses benzodiazepine-induced sedation, and antagonizes the actions of **ZOLPIDEM**
- Does not reverse the actions of barbiturates, opiate agonists, or tricyclic antidepressants

CONTRAINDICATIONS:

- Alcoholism, benzodiazepine dependence, head trauma, increased intracranial pressure, overdose, seizure disorder, seizures, status epilepticus, substance abuse

PRECAUTIONS:

- **FLUMAZENIL** has a much shorter duration of action than do many of the benzodiazepines it is used to counteract. Resedation can occur. Patients having regained consciousness should be monitored until the possibility of resedation has been eliminated.

CONCENTRATION:

- 0.1 mg / mL

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.853**
	TITLE: Hypertonic Saline	**Effective Date 11/1/2022**

HYPERTONIC 3% SALINE (HS) is not a new drug or preparation, it has been around for years as a volume expander, treatment of hyponatremic seizures and other clinical situations. Recent literature has endorsed it as the drug of choice for cerebral edema (CE), either vasogenic or cytotoxic, in both adults and children. **HYPERTONIC SALINE (HS)** may be used in place of **MANNITOL** or given before or after a mannitol bolus, depending on the clinical situation.

Cerebral edema is responsible for most of the deaths due to DKA in children, and significant neurologic morbidity persists in many survivors. Cerebral edema typically presents 4 to 12 hours after treatment has begun, it can present later or earlier, including before treatment is initiated. This is the window of time when EMS makes patient contact. Below is a clinical decision tool for CE in Pediatric DKA presentations by Muir, et al, 2004. Cerebral Edema is a pathological result of many other etiologies, such as, stroke, trauma, hypoxia; all causes are potentially encountered by EMS and can by treated with HS.

HYPERTONIC SALINE will be stocked on all AdventHealth ALS, CC Ambulances and aircraft moving forward. Currently, it is available in 500 mL IV solution bags. There is a very high risk for a human factor substitution error, where **3% SALINE** IV bag can be confused with a normal saline bag.

All Hypertonic Saline Solutions will be specially wrapped and tagged to avoid this substitution error. 2 bags per unit is the SCT par level.

Indications: Symptomatic Vasogenic (Trauma/Hypoxia) or Cytotoxic (Hyperosmolar) Cerebral Edema (CE), Symptomatic Increased ICP, Blunt-force Head Trauma with Cushing's Triad or herniation syndrome, hyponatremic seizure activity, Cystic Fibrosis (Inhalation/nebulizer therapy).

Contraindications: Intravenous line infiltrations, Sodium level>155mEq/L. Hypertonic Solutions restricted to Critical Care/Flight SCT Units only, unless authorized by EMS Medical Director for ALS units. Not to be used with Tolvaptan.

Cautions: Substitution Error, looks like normal saline. Do not delay HS treatment waiting for CT imaging. No CT image ever changed CE Treatment. 67% Head CTs are "normal" with progressive neurologic dysfunction.

Dose: One-time Bolus of 1 to 5 mL/Kg IV Bolus, run on an IV Infusion pump over 20 minutes, max dose of 250mL for adults and children. May be given via peripheral IV/IO access. Central Venous access preferred, but not required.

4mL nebulized (inhaled) treatment of **3% SALINE** may be used in for thick secretions/mucus plugging, as in cystic fibrosis exacerbations.

Monitoring: All usual monitoring tools to be utilized, including POC Blood Glucose Level (BGL) and Temperature.

Documentation: Usual medication/intervention documentation. Amount, infusion rate, time and adverse effects noted.

References:

Cooke, DW, etal. **"Management of Diabetic Ketoacidosis in Children and Adolescents"**. *Pediatrics in Review* 2008;29(12):431-436.

Lexicomp, **"Sodium Chloride"**. https://online.lexi.com/lco/action/home

Lumba-Brown A, etal. **"Emergency Department Implementation of the Brain Trauma Foundation's Pediatric Severe Brain Injury Guideline Recommendations"**. *Pediatric Emergency Care* 2020;36:e239-e241.

Luu JL, etal. **"Three Precent Saline Administration During Pediatric Critical Care Transport"**. *Pediatric Emergency Care* 2011;27:1113-1117.

Muir,AB, etal. **"Cerebral Edema in Childhood Diabetes Ketoacidosis."** *Diabetes Care* 2004;27:1541–1546.

Tintinalli J.E., etal (2020). **Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 9e.** McGraw Hill. https://accessemergencymedicine.mhmedical.com/content.aspx?bookid=2353&sectionid=183421313

Photos of 3% Saline packaging on AHEMS SCT Ambulances:

Clinical Decision Tool for Pediatric CE in DKA

Table 1—*Bedside evaluation of neurological state of children with DKA*

Diagnostic criteria
- Abnormal motor or verbal response to pain
- Decorticate or decerebrate posture
- Cranial nerve palsy (especially III, IV, and VI)
- Abnormal neurogenic respiratory pattern (e.g., grunting, tachypnea, Cheyne-Stokes respiration, apneusis)

Major criteria
- Altered mentation/fluctuating level of consciousness
- Sustained heart rate deceleration (decline more than 20 bpm) not attributable to improved intravascular volume or sleep state
- Age-inappropriate incontinence

Minor criteria
- Vomiting
- Headache
- Lethargy or being not easily aroused from sleep
- Diastolic blood pressure >90 mmHg
- Age <5 years

(Muir, 2004) Diagnostic criterion, two major criteria, or one major + two minor criteria, yielded a sensitivity of 92% and a false-positive rate of 4%.

CONTACT MEDICAL CONTROL AS NEEDED

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.901**
	PROCEDURE GUIDELINES BLOOD GLUCOSE TEST	**Effective Date 08/01/2020**

All clinical disciplines including EMTs, Paramedics, CC Paramedics, RRTs, and RNs are authorized to perform Blood Glucose Testing, under this guideline.

CHECK STRIP TEST

EQUIPMENT:

- Bayer Contour ™ Glucometer
- Bayer Contour Glucose test strips

CONTROL TEST:

- Control Testing procedure
- All Glucometers will be tested monthly by the EMS supervisors. Documentation of glucometer test log is available for verification at any time.

BLOOD GLUCOSE TEST

INDICATIONS:

- Altered sensorium or suspected blood sugar abnormality based on history.

PROCESS:

- Prepare Glucometer and test strips, alcohol prep pads, gauze, and lancet.
- Clean fingertip with alcohol prep pad.
- Dry finger tip
- Perform finger stick technique
- Wipe away first drop of blood, place small droplet onto glucose test trip.
- Critical values are less than 60 or greater than 450. Reportable range for glucometer is --------
- Apply pressure to Lancet insertion site.
- Clean and disinfect glucometer after each use.

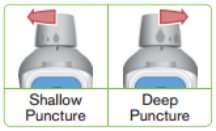
Testing

Getting the Blood Drop

Getting the Blood Drop:

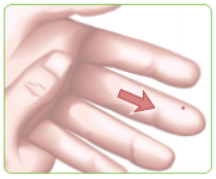
The puncture depth depends on the endcap setting and the amount of pressure applied to the puncture site. You will determine which combination works best for you.

*Use the **Gray** endcap*

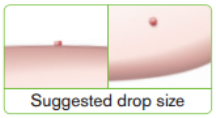


Press the endcap firmly against the puncture site and press the blue release button with your thumb.

Stroke your hand and finger towards the puncture site to form a drop of blood. Do not squeeze around the puncture site.



Test immediately after a good blood drop has formed.

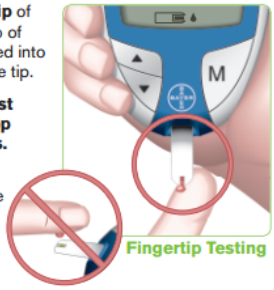


Testing Your Blood:

Immediately touch the **tip** of the test strip to the drop of blood. The blood is pulled into the test strip through the tip.

Hold the tip of the test strip in the blood drop until the meter beeps.

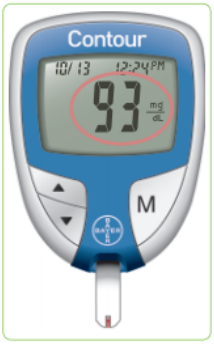
Do not press the tip against the skin or place the blood on top of the test strip or you could get inaccurate results or errors.



After a beep, you will see the meter count down 5 seconds. Please do not touch the test strip during the countdown as this may result in an error.

Your test result will appear and will be automatically stored in the meter memory.

Remove the test strip to turn your meter off.



Error Codes and Symbols:

If you do not resolve the problem, contact Bayer Diabetes Care Customer Service at 1-800-348-8100.

WHAT YOU SEE	WHAT IT MEANS	WHAT YOU SHOULD DO
(will flash for 10 seconds and then the meter will turn off)	Dead batteries.	Replace the batteries. Call Bayer Diabetes Care Customer Service at 1-800-348-8100 for the Free Batteries for Life program.
(will remain on the display)	Low batteries.	Replace the batteries as soon as possible.
E1	Temperature out of range.	Move to an area that is within the operating range for the meter: 41°F–113°F. Let the meter adjust to this temperature for 20 minutes before performing a test.
E2	The test strip has not filled enough for an accurate test. Insufficient blood drop.	Remove the test strip and retest using a new test strip. Wait until you see the flashing blood drop on the display before testing.
E3	The meter is sensing a used test strip.	Remove the test strip and retest using a new test strip. Wait until you see the flashing blood drop on the display before testing.
E4	Test strip not inserted correctly.	Remove and reinsert the test strip properly (see page 9).
E5 E9 E6 E12 E8 E13	Potential software or hardware issue.	Remove the test strip and retest using a new test strip. If you continue to have problems, contact Bayer Diabetes Care Customer Service.

WHAT YOU SEE	WHAT IT MEANS	WHAT YOU SHOULD DO
E7	Incorrect sensor type.	Remove the test strip and retest using a new test strip. Make certain that you are using a CONTOUR® test strip from Bayer.
E10	Invalid date or time.	This error occurs only in Communication mode. See page 21 to reset the date or time. If you continue to see this error, please contact Bayer Diabetes Care Customer Service.
E11	Abnormal result.	Remove the test strip and retest using a new test strip. Be sure you wash and dry your hands and carefully follow instructions in this user guide.
HI	Test result is above 600 mg/dL.	• Wash and dry your hands and the test site. Repeat the test using a new test strip. • If your result still flashes "HI," contact your physician or health-care professional immediately.
CAUTION: Glucose levels above 250 mg/dL may indicate a potentially serious medical condition.		
LO	Test result is below 10 mg/dL.	• Repeat the test using a new test strip. • If your result still flashes "LO," contact your physician or health-care professional immediately.
CAUTION: Glucose levels below 50 mg/dL may indicate a potentially serious medical condition.		

FAST PATCH METHOD

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.*

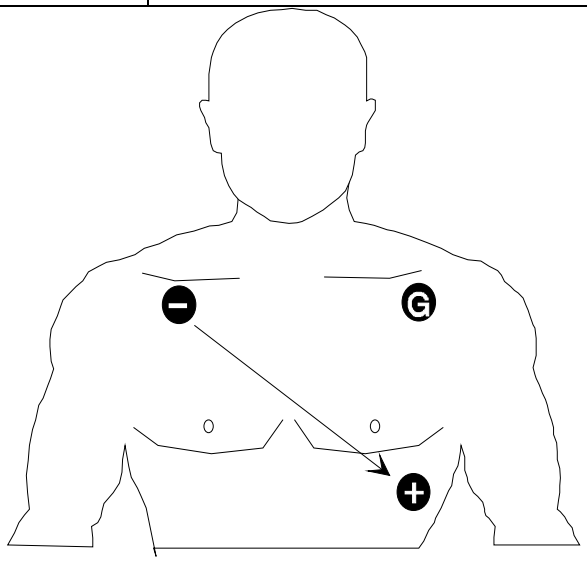
     Apply PAD and APEX wire *to the anterior (mid-axillary) line below the nipple.*
   - Ensure the paddles are in FAST PATCH adapter with the paddles in the proper side.
   - Ensure the monitor is in the PADDLES mode in the lead selection.
   - Ensure pads are at least 1” from any implanted device.
   - Remove all patches and/or medication devices and wipe area clean prior to placing pads/patches on chest. Ensure pads/patches are at least 2” from site.

FOUR-LEAD METHOD

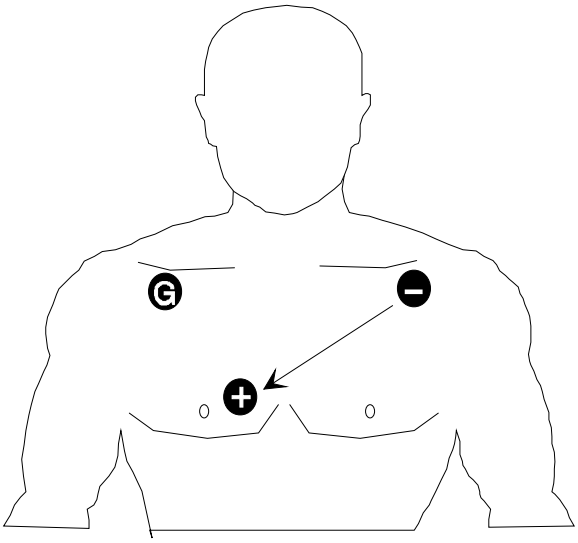
1. **INDICATIONS:**
   - Determination and monitoring of cardiac rhythms.
2. **PROCEDURE:**
   - Remove clothing from area electrodes will be placed.
   - Apply wires to electrodes.
   - Place on patient as illustrated for selection lead.

CARDIAC MONITOR (CONTINUED)

THREE-LEAD METHOD

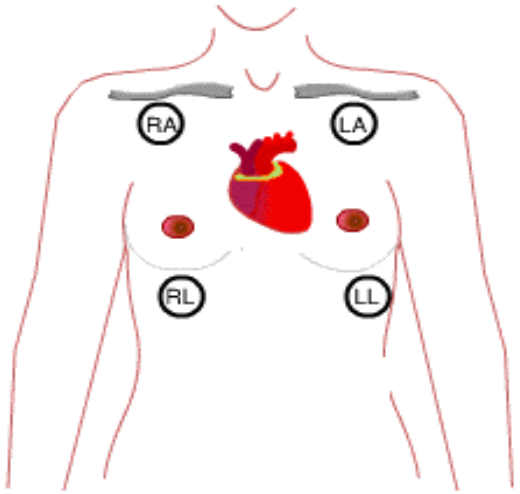


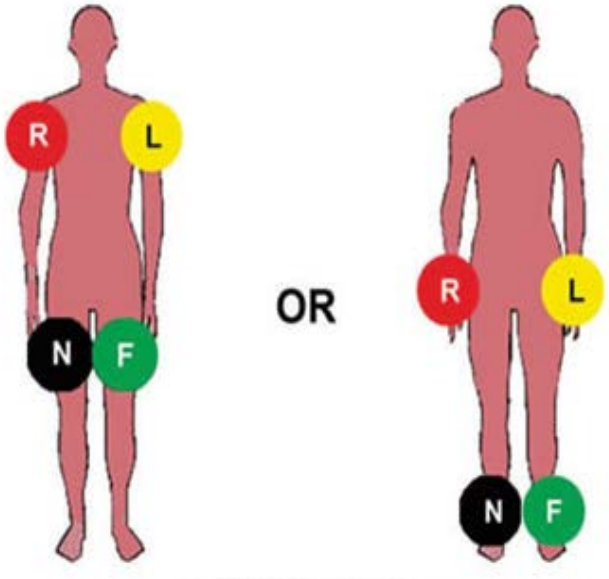
Placement for monitoring Lead II



Placement for monitoring MCL I

FOUR-LEAD METHOD



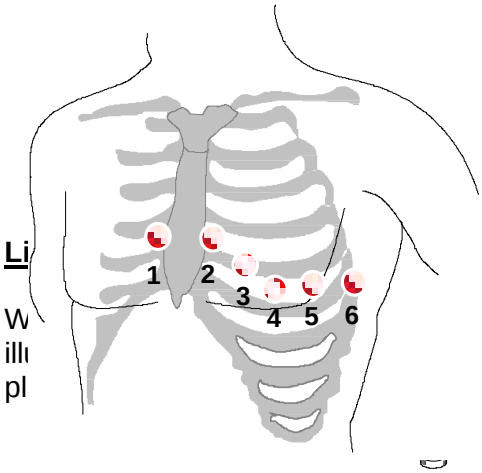


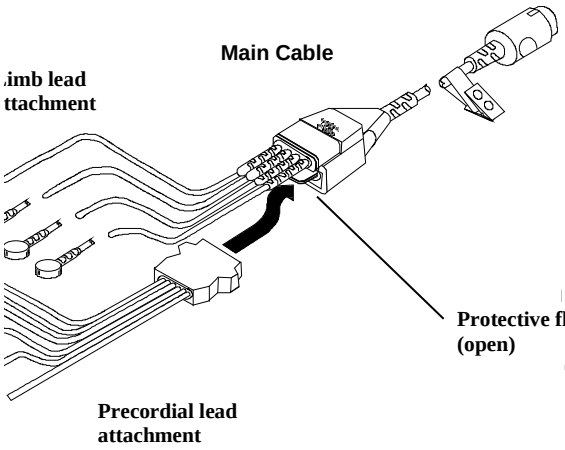
Placement for monitoring Leads RA, LA, LL and RL

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:

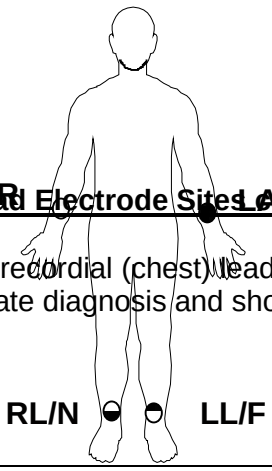




Li

W the wrists and the ankles as
illu limbs. However, do not
pl -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



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
V2	Fourth intercostal space to the left of the
V3	Directly between leads V2 and V4.
V4	Fifth intercostal space at midclavicular line.
V5	Level with V4 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.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.903**
	PROCEDURE GUIDELINES CARDIOVERSION	**Effective Date 08/01/2020**

1. **INDICATIONS:**
   - Narrow Complex Tachycardia
   - Wide Complex Tachycardia
   - 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 protocols 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 PROCEDURE:**
   - Confirm the rhythm.
   - Select synchronization and look for flagging of the QRS.
   - Check fast patch pads position and conduction.
   - Select appropriate energy level per Standing Order.
   - Check to ensure all people, including yourself; are clear of the patient. Ensure EMS personnel are in a safe operating location.
   - Discharge by pressing discharge button 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 per protocol.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.904**
	PROCEDURE GUIDELINES **CONTINUOUS POSITIVE AIRWAY PRESSURE**	**Effective Date 08/01/2020**

Continuous Positive Airway Pressure (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 at a normal or elevated rate. CPAP is not intended for bradypnea patients.

I. INDICATIONS:

A. Indicated for hypoxemia secondary to:
   1. Pulmonary Edema
   2. COPD
   3. Asthma

B. To be utilized for patients ≥ 40 kg

II. CONTRAINDICATIONS:

A. Penetrating chest trauma
B. Severe hypotension
C. Persistent nausea and or vomiting
D. Obtunded
E. Respiratory or cardiac arrest
F. Patient unable to protect their own airway

III. PROCEDURE:

A. Determine appropriate PEEP valve, confirm with Respiratory Therapist (interfacility) or select appropriate PEEP valve - (prehospital) 7.5 cm for COPD and Asthma, or 10 cm for Pulmonary Edema. ***Do not bypass, delay or withhold conventional treatment while assembling or using the CPAP device***.
B. Assemble the equipment. **Figure 1**
C. Explain the procedure to the patient to help alleviate any anxiety.
D. Test the equipment prior to placing on the patient.
E. Put the mask to the face of the patient using the least amount of pressure to make a seal.
F. Watch the PEEP valve to ensure that it remains open during inspiration.
G. Monitor the patient's condition for improvement, including the respiratory rate, mental status and SaO2 percentage.
   1. If the patient's condition is improving, continue to monitor the patient.
   2. If the patient's condition is deteriorating despite increasing the oxygen adjustment valve, discontinue the CPAP device and prepare for oraltracheal intubation.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.905**
	PROCEDURE GUIDELINES **DEFIBRILLATION – PEDIATRIC**	**Effective Date 08/01/2020**

1. **INDICATION:**

- V-FIB / 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 fast patch pads.

3. **DEFIBRILLATION:**

- Confirm the patient is unresponsive and pulseless.
- Ensure synchronizer is turned **off**.
- Stop CPR and call **ALL CLEAR**. check to ensure all people, including yourself, are clear of the patient. Ensure EMS personnel are in a safe operating location.
- Discharge energy by pressing discharge button.
- Observe for rhythm change and check the patient for a pulse, (if applicable).
- Repeat per protocol.

INDICATION:

- V-FIB / PULSELESS VENTRICULAR TACHYCARDIA

  - Check the equipment - Turn on the monitor / defibrillator.
  - Apply monitor per Procedure Guideline.
  - 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 yourself are clear of the patient. Ensure EMS personnel are in a safe operating location.
- Discharge energy by pressing discharge button.
- Observe for rhythm change and check the patient for a pulse, (If applicable).
- Repeat per protocol.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.907**
	PROCEDURE GUIDELINES **END TIDAL CO_2 MONITORING / CAPNOGRAPHY**	**Effective Date 08/01/2020**

1. INDICATIONS:

Intubated applications (Mainstream)

- Verification of ETT placement
- ETT surveillance during transport
- CPR: compression efficacy, early sign of ROSC, survival predictor*
- Optimize ventilation of patients

** Objective data to terminate resuscitation*

2. PROCEDURE:

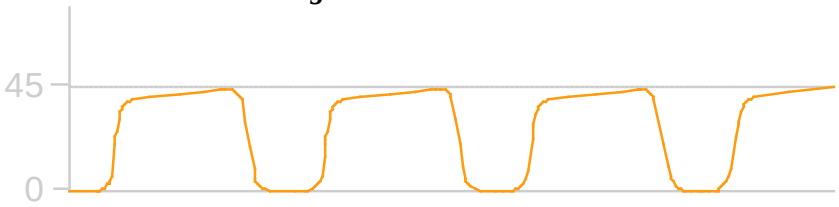
- Select $EtCO^2$ setting on monitor if not set to default
- Assure nasal cannula or sensor to E.T. tube is correctly placed
- Check for wave forms
- Record wave form
- Capnography device should remain in place for continuous monitoring, with frequent checks to ascertain that the tube does not migrate.
- At hospital, record waveform again

3. DOCUMENTATION:

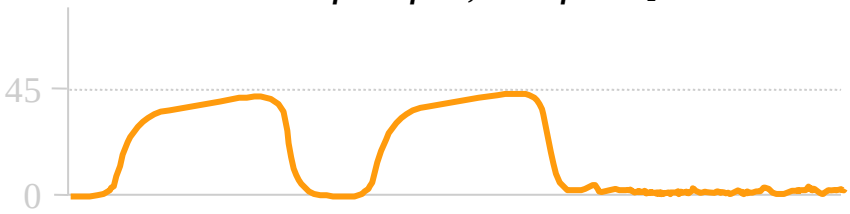
- Upon confirmation of successful endotracheal intubation (positive wave form), print a strip and document the initial reading on the abbreviated report.
- Document any airway or pharmacologic interventions based on capnography readings.
- Upon arrival to the emergency department and after transferring the patient to the hospital's bed; obtain a second strip demonstrating a continued positive wave form.
- Attach both strips to the completed run report.
  A code summary should accompany all cardiac arrest reports.

CAPNOGRAPHY WAVEFORM ANALYSIS:

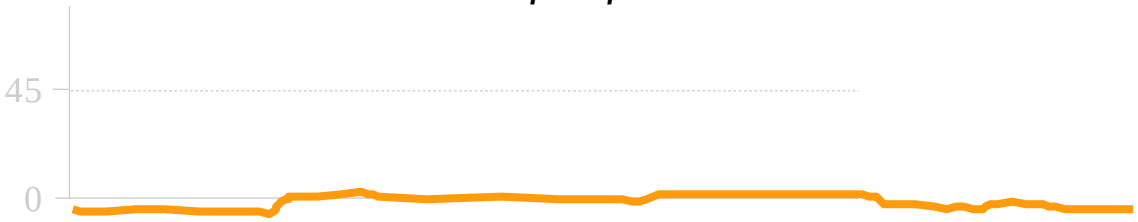
NORMAL – 35-45 mm Hg ***MANAGEMENT: Monitor***



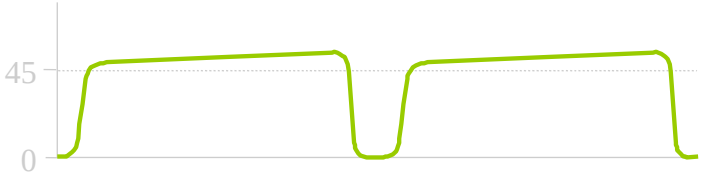
DISLODGED ETT: Loss of waveform, Loss of $EtCO_2$ ***MANAGEMENT: Replace ETT***



ESOPHAGEAL INTUBATION: Absence of waveform ***MANAGEMENT: Re-intubate***

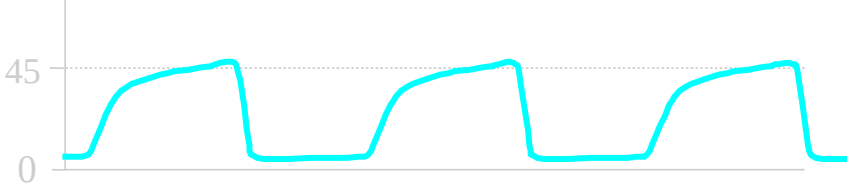


HYPOVENTILATION: ↓ RR, $EtCO_2$ > 45 mm Hg ***MANAGEMENT: Assist ventilations/intubate***



HYPERVENTILATION: ↑RR, $EtCO_2$ < 35 mm Hg ***MANAGEMENT: ↓ventilations***

BRONCHOSPASM: "Sharkfin" ***MANAGEMENT: Bronchodilators***



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.908**
	PROCEDURE GUIDELINES **EZ-IO™: Intraosseous Device**	**Effective Date 11/01/2021**

INDICATIONS:

1. Patient requiring immediate volume, blood and/or medication administration in which adequate peripheral access attempts (including external jugular vein, when accessible) have been unsuccessful or where further delay will likely result in further patient decompensation or demise.
2. LD Needle set (yellow in color) for all adult patients, Approved insertion site in the proximal humerus.
3. AD needle set (blue in color) for patients 40kg and above. Approved insertion sites are proximal tibia and distal femur.
4. PD needle set (pink in color) for patients 3kg-39kg. Approved insertion sites proximal and distal tibia.

CONTRAINDICATIONS:

1. Fracture of the insertion extremity (*consider alternate approved site*)
2. Previous orthopedic procedures (IO within 24 hours, knee replacement) (*consider alternate approved site))*
3. Pre-Existing Medical Condition (*tumor near site or peripheral vascular disease*)
4. Infection at insertion site (*consider alternate site*)
5. Inability to locate landmarks (*significant edema*)
6. Excessive tissue at insertion site (*obesity*)

CONSIDERATIONS:

Flow rates:

Due to the anatomy of the IO space you will note flow rates to be slower than those achieved with peripheral catheters.

- Ensure 10 mL rapid bolus (flush) for over 40 kg patients and 5 mL flush for 3kg-39kg patients
- Use a pressure bag for continuous infusions (monitor pediatric fluid administration)

Pain:

Insertion of the EZ-IO™ in conscious patients causes mild to moderate discomfort and is usually no more painful than a large bore IV. Pressure infusion can cause increased pain in the conscious patient. Prior to IO flush on alert patients, SLOWLY administer Lidocaine 2% 0.5mg/kg IO for anesthetic purposes. Lidocaine should be preservative free. If patient was initially unresponsive and becomes conscious or exhibits pain response to pressure infusion, administer Lidocaine as above. Consider additional sedation/pain medication IO.

EQUIPMENT:

EZ-IO™ Driver
EZ-IO™ Needle Set (AD- 40 kg and greater. PD-3kg-39kg)
Alcohol or Betadine® Swab
EZ-Connect ™
IV tubing/fluid
10 ml Syringe
Tape or Gauze
Pressure Bag
2 % IV Lidocaine (Prefilled Cardiac version)
EZ-IO wristband

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.908**
	PROCEDURE GUIDELINES **EZ-IO™: Intraosseous Device**	**Effective Date 11/01/2021**

PLACEMENT PROCEDURE:

1) Preparation
   a) Determine if placement is indicated
   b) Confirm that there are no contraindications
   c) Wear approved Body Substance Isolation or Personal Protective Equipment
2) Placement
   a) Locate the insertion site.
   b) Cleanse the insertion site using aseptic technique
   c) Prepare the EZ-IO™ driver and needle set
   d) Stabilize extremity and insert EZ-IO™ needle set
   e) Remove EZ-IO™ Driver from needle set while stabilizing catheter hub
   f) Remove stylet from needle set, place stylet in shuttle or sharps container
3) Post Procedure
   a) Confirm correct placement
   b) Connect the primed extension set or IV tubing
   c) Flush the device

      i) In conscious patients, slowly administer 2% Lidocaine 0.5mg/kg into the IO space. You may also prime the extension set with Lidocaine to decrease any irritation in the medullary space.
      ii) If unconscious, flush or bolus the EZ-IO™ catheter with 5-10 ml of normal saline.
   d) Place a pressure bag on solution being infused for best flow rates where applicable
   e) Begin infusion
   f) Secure tubing
   g) Place wristband on patient, fill in date and time of insertion
   h) Monitor EZ-IO™ site and patient condition

REMOVAL PROCEDURE

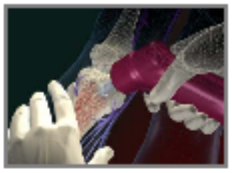
1. Remove catheter by securing a 10 mL leur-lock syringe to “cap off” IO open port as well as functioning as an extra handle. Turn clockwise with continuous 360^0 rotations while gently pulling back at a 90 degree angle and with a firm steady non-rocking movement. The device is not threaded but requires loosening from the bone. Gently pull while turning, turn more than you pull.
2. Dispose of the catheter in a manner appropriate for contaminated sharps.
3. Apply pressure to the site and then dress the wound using aseptic technique.

DOCUMENTATION:

1. Document assessment findings, interventions, and outcomes with special attention paid to any problems or complications.

EZ-IO® by vidacare

Pearls of IO Access



Driver

- Drivers are sealed *Please don't try to open them!*
- Batteries are not replaceable (*Drivers are designed for ~1000 insertions)*
- Daily testing is not necessary or recommended
- Follow the Driver's "instructions for use" when cleaning. Ensure that you clean the entire driver (*including the drive shaft tip*)
- Remember, the driver is rugged – *but not indestructible*
- An IO Insertion is a medical procedure – *not a construction project,* **BE GENTLE. LET THE RPM'S DO THE WORK .**

Needle Sets

- Single use only
- One size does not fit all! Consider the patient first.
- PD (Pink) Needle Sets are for most patients ~3-39 kg

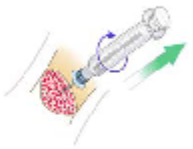
- AD (Blue) Needle Sets are for most patients 40 kg and greater

- LD (Yellow) Needle set for excessive tissue.

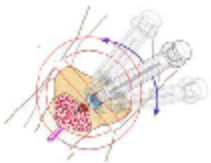
- Use ***SOFT TISSUE DEPTH*** - NOT age and total body weight as the decision tool.
- You may insert manually (if needed) – *let the tip do the work – avoid excessive force*!
- **Red** Needle Sets are for Training only and are NOT STERILE!
- Remember "Easy Does It" – do not use excessive insertion forces. Glide the needle set into place.
- To confirm appropriate needle selection, you need to see at least one black line above the skin after needle is pierced through the tissue resting against the bone.

Vidacare Corporation 722 Isom Road San Antonio Texas 78216

Removal



- Remove within 24 hours
- Stabilize extremity
- Connect sterile Luer lock syringe
- Rotate clockwise a few rotations and continue to rotate while gently pulling straight up
- Place removed catheter in biohazard container
- Remove EZ-IO Armband



AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.909**
	PROCEDURE GUIDELINES **INTUBATION (ENDOTRACHEAL)**	**Effective Date 08/01/2020**

1. INDICATIONS:

- Respiratory or cardiac arrest.
- Glasgow Coma Scale of 8 or less.
- Decreased minute volume.
- 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 mL syringe, (check cuff for patency).
- Stylet, (insert into ET tube).
- Tape or endotracheal securing device.
- Proper size oral pharyngeal airway.
- BVM.
- Suction.
- Stethoscope.

3. PROCEDURE:

- If C-spine injury suspected, maintain cervical alignment and apply C-collar.
- Pre-oxygenate the patient 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 for no more than 20 seconds. Maximum interruption of ventilations should not exceed 20 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.
- 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 mL of air and remove the syringe from inflation valve.

- Attach EtCO2 sensor to obtain wave-form Capnography.
- 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.

  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 per current guidelines.
  - Resume CPR, (if applicable).

4. SECURE:

- Use endotracheal securing device and secure endotracheal tube in place noting depth of tube.
- Measure and place a c-collar, to limit head movement.
- Secure head with head bed or restrain to spine board.
- Upon confirmation of successful endotracheal intubation (positive wave form), print a strip and document the initial reading on the abbreviated report.
- Continue ventilations.

5. DOCUMENTATION:

- Upon confirmation of successful endotracheal intubation (positive wave form) document the initial reading on the abbreviated report.
- Document any airway or pharmacologic interventions based on capnography readings.
- An electronic code summary should accompany all cardiac arrest reports.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.910**
	PROCEDURE GUIDELINES **KING LT-D AIRWAY**	**Effective Date 08/01/2020**

NOTE: The KING LT-D airway does not protect the airway from the effects of regurgitation and aspiration.

1. Indications - to be used only on an *unconscious* apneic patient for management of controlled or spontaneous ventilation.

2. **Contraindications:**
   - Patient's height is less than 4 feet in height.
   - Patient has a gag reflex.
   - Massive facial trauma which will prevent a good seal.
   - Foreign body in the trachea.
   - Patient who can be aroused with the administration of Narcan or D50W.
   - History of esophageal disease.
   - Ingestion of a caustic poison/acid.

3. **Equipment:**
   - KING LT-D airway tube (check cuff and inflation system for patency and leaks).
   - 60- 80ml syringe.
   - Water soluble lubricating gel (lubricate beveled distal end of tube).
   - Tape
   - Suction.
   - Stethoscope.
   - BVM.

4. **Insertion:**
   - Maintain patient's head in sniffing position or normal alignment. DO NOT HYPEREXTEND NECK.
   - Grasp the tube at the connector with the dominate hand.
   - Interrupt CPR for no longer than 15 seconds.
   - Grasp the patient's jaw with the non-dominate hand with the KING LT-D airway rotated laterally 45-90 such that the blue orientation line is touching the corner of the mouth and insert tube tip passes under tongue, rotate tube back to midline (blue orientation line faces chin)
     Without exerting excessive force, advance tube until base of connector is aligned with teeth and gums.
   - Inflate the cuffs of the KING LT-D airway with the appropriate volume. (Size-3 50 ml, Size-4 70 ml, Size-5 80 ml).
   - Ventilate with a bag valve through the tube and watch for bilateral chest rise.
   - Listen for bilateral breath sounds:

     ***If no breath sounds heard**, reposition the patient's head and neck and listen again. If no lung sounds heard, readjust cuff to just seal volume.*

     ***If vomitus present in mouth**, suction before ventilating.*
   - Inflate the obturator cuff with 60ml – 80 ml of air and remove the syringe.
   - Continue ventilating patient with BVM.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.911**
	TITLE: MAD (MUCOUS ATOMIZATION DEVICE)	**Effective Date 08/01/2020**

The MAD device is an effective way to deliver medications in the emergency setting. When delivered nasally, the drug is not affected by first pass metabolism. Membranes of the nose are in direct contact with the brain and CSF. Medications absorbed across the membranes directly enter the CSF. The nose offers a rapid and direct drug delivery route.

Amount of Drug absorbed:

- IV=100%
- IN=95%-100%

Factors affecting absorption:

- Drug concentration
- pH
- High Volumes

Contraindications:

- Epistaxis
- Trauma
- Septal abnormality
- Nasal congestion
- Cocaine abuse

Advantages of IN / MAD use:

- Decrease in needle sticks
- Convienient
- Nose = Rapid access point
- Painless
- No special training required

Blade Fitting

The McGRATH® is designed to be used only with McGRATH® Disposable Intubation Blades.

These blades are packaged and supplied sterile and MUST be disposed of after each patient use.

--To fit the blade, remove the blade from sterile packaging and slide over the CameraStick™. The blade is fully located when the blade clip is firmly latched to the CameraStick

- The laryngoscope should be turned on as detailed in section 2.7. A bright light should appear at the tip of the CameraStick™, and an image on the screen at the top of the handle
- **Sedation to be administered per sedation protocol.**.
- The tip of the laryngoscope blade should be inserted into the mouth in the midline, superior to the tongue, and rotated towards the larynx in a sagittal plane until the epiglottis is visible. Either direct vision, along the superior surface of the blade, or indirect vision via the camera, can be used to guide the laryngoscope tip toward the larynx. Care should be taken, as with conventional laryngoscopy, that the blade does not make contact with the teeth.
- The tip of the blade should be guided into the vallecula.
- Further rotation, and/or minimal force applied along the long axis of the handle, should lift the epiglottis and allow the a view of the glottis. Again, either direct or indirect vision can be used to view the glottis.
- Once the glottic opening has been correctly identified, a correctly sized tracheal tube can be passed between the vocal cords. A bougie or a malleable introducer may be used to assist the passage of the tracheal tube.

- If a malleable introducer is used, we recommend that a “hockey stick” curve be made at a point about 5cm from the tip of the tracheal tube.
- The laryngoscope can then be carefully withdrawn by reversing the process described above. Confirmation of the correct placement of the tracheal tube should be both visual, and by the use of capnography.

The device should be cleaned after each patient usage.

1. Always ensure that battery is removed when being cleaned.
2. The unit is waterproof to a rating of IP65 and therefore NOT suitable for immersion.
3. The device should be cleaned in accordance with local cleaning regimes for non-immersable sterile devices

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.913**
	PROCEDURE GUIDELINES **MEDICATION ADMINISTRATION – BREATH ACTIVATED NEBULIZER**	**Effective Date 08/01/2020**

1. INDICATIONS:

- ACUTE ASTHMA / COPD WITH WHEEZING
- CROUP / EPLIGLOTTITIS
- ACUTE PULMONARY EDEMA

2. EQUIPMENT:

- 1 oxygen supply tubing.
- 1 Breath Activated Nebulizer
- Non-humidified oxygen with a flow meter.
- Medication to be given.

3. PROCEDURE:

- Assemble oxygen supply tubing to the breath activated nebulizer.
- Add the medication to the nebulizing chamber.
- Connect the top of the nebulizing chamber.
- 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 breath activated nebulizer to the patient and have them breathe the medication.
- Auscultate breath sounds.

4. MONITOR:

- Blood pressure
- Heart rate
- Respiratory status

1. INDICATIONS:

- **Nasal Cannula (NC)**: for the spontaneously adequately breathing patient with no significant compromise or **potential** compromise in condition. Choice is determined by severity of condition, Oxygen Therapy Protocol and patient tolerance. Nasal cannula should also be considered when the patient is unable to tolerate a mask.
- **Non-Rebreather Mask:** for any patient whose condition or complaint suggests that severe hypoxia or breathing 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:** 1 - 6 liters/minute delivers 24 - 44 % of oxygen.
- **Non-Rebreather Mask (NRB):** 15 liters/minute delivers > 90 % of oxygen.
- **Bag Valve Mask,(BVM):** with supplemental oxygen at 15 liters/minute and reservoir attached delivers approximately 100% oxygen.

1. **Preparing the IV:**
   - IV Kit Components:
     - *IV solution.*
     - *Micro drip, macro drip, buretrol or dial-a-flow*
     - *# 14 - #24 catheter over the needle, or butterfly needle.*
     - *Venous tourniquet* *****
     - *Antiseptic swab* *****
     - *Gauze pad or adhesive bandage* *****
     - *Antibiotic ointment* *****
     - *Veniguard or Tegaderm*
   - 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.

2. **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 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 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.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.916**
	TITLE: L.U.C.A.S. DEVICE	**Effective Date 08/01/2020**

The LUCAS device is an easy-to-use **mechanical chest compression device** that helps lifesaving teams around the world deliver high-quality, guidelines-consistent chest compressions to sudden cardiac arrest patients; in the field, on the move and in the hospital.

INTENDED USE:

- LUCAS Chest Compression System is to be used for performing external cardiac compressions on adult patients who have acute circulatory arrest defined as an absence of spontaneous breathing and pulse, and loss of consciousness.
- The LUCAS device must only be used in cases where chest compressions are likely to help the patient.
- The LUCAS 3 device is for use as an adjunct to manual CPR when effective manual CPR is not possible (e.g., transport, extended CPR, fatigue, insufficient personnel).

CONTRAINDICATIONS:

Do NOT use the LUCAS Chest Compression System in these cases:

- If it is not possible to position the LUCAS device safely or correctly on the patient's chest.
- Too small patient: if the LUCAS device alerts with 3 fast signals when lowering the Suction Cup, and you cannot enter the PAUSE mode or ACTIVE mode.
- Too large patient: If you cannot lock the Upper Part of the LUCAS device to the Back Plate without compressing the patient's chest.

APPLICATION:

1. Remove the Back Plate from the Carrying Case.
2. Temporarily stop manual CPR while placing the Back Plate under the patient, immediately below the armpits. You can use several procedures to do this: either lift the patient's torso and slide the Back Plate under from the head, or log roll the patient and slide the Back Plate in from the side.
3. Start manual CPR again.
4. Hold the handles on the Support Legs to remove the LUCAS Upper Part from the case. Pull the Release Rings once to make sure that the Claw Locks are open, then let go of the Release Rings.
5. Attach the Support Leg that is nearest you to the Back Plate.
6. Move the other Support Leg through the arms of the responder doing manual CPR and stop manual CPR while you attach the Support Leg to the Back Plate. Ask your partner to assist with attaching the second Support Leg if needed. Listen for a click.
7. Pull up once to make sure the parts are correctly attached.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.916**
	TITLE: L.U.C.A.S. DEVICE	**Effective Date 08/01/2020**

OPERATION:

1. Use your finger to make sure the Suction Sup is immediately above the end of the sternum. If necessary, move the device by pulling the Support Legs to adjust the position.
2. Adjust the height of the Suction Cup to set the Start Position. This is the position where the LUCAS device will start its two-inch compressions, and the point where it will return the chest for full recoil.
    - Make sure the LUCAS device is in ADJUST mode
    - Push the Suction Cup down with two fingers until the Pressure Pad touches the patient's chest without compressing it
    - Push PAUSE to lock the start position.
    - Check for proper position. If you need to reposition:
    - Push ADJUST, pull the Suction Cup up, move the device by pulling the Support Legs, push the Suction Cup down until the Pressure Pad touches the chest, then push PAUSE once back in place
    - Push either ACTIVE (continuous), or ACTIVE (30:2) .

1. **INDICATIONS:**
   - Chest decompression for relief of tension pneumothorax.

2. **EQUIPMENT:**
   - 14 gauge 2.5 inch or commercially available 4 inch catheter over the needle.
   - Sterile glove finger.
     Thread the #14 gauge catheter through the end of the glove finger from the inside.
   - Tape.
   - Sterile gauze pads.
   - Antiseptic swabs.
   - Occlusive dressing.

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 with a glove finger placed over the needle and catheter to serve as a flutter valve.
   - 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.
   - Flutter valve must be outside dressing and unobstructed.
   - Assess breath sounds and respiratory status.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.918**
	PROCEDURE GUIDELINES **Plum 360 Infusion Pump**	**Effective Date 08/01/2020**

1. **To Setup**

   - Close Flow Regulator by pushing in
   - Prime set according to set package instructions
   - Open door handle to insert fully primed cassette
   - Close door and verify NO FLOW

2. **To Operate**

   - Closing door on primed cassette being automatic start-up sequence
   - Follow message display to enter settings
   - Press START

3. **To Titrate** (While Device is Infusing):

   - Select Line A or B ant the min delivery screen
   - Enter numeric value
   - Press START to begin titration

4. **To Backprime**

   - STOP infusion on all lines
   - Secondary container or syringe is necessary to receive the air
   - Press and hold BACK PRIME until air is cleared from cassette into secondary container
   - Release when complete
   - Restart infusion

5. **To Discontinue Infusion**

   - Press STOP
   - Select STOP ALL if both lines are pumping
   - Press ON/OFF
   - Clamp secondary tubing if connected
   - Open door, remover set and close door

6. **Response to Alarms**

   - Disable Lockout by confirming back switch is in the down position
   - Press SILENCE
   - Identify/Observe alarm condition
   - Correct alarm condition
   - Press START to resume infusion

- If you encounter a patient who is on a backboard call Medical Direction for further instructions if sending MD does not want to remove backboard.

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.920**
	PROCEDURE GUIDELINES **TRANSCUTANEOUS PACING PROCEDURE**	**Effective Date 08/01/2020**

INDICATIONS:

- BRADYCARDIA AND A.V. BLOCKS

1. 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* ***MIDAZOLAM 2-4 mg IV and may repeat in 5-10 minutes to maximum of 10 mg.***

- Set the rate at 70 beats per minute.
- Slowly increase milliamps until electrical and mechanical capture is achieved or maximum output is reached. Increase by 10% after capture achieved.
- Keep checking for a carotid or 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 5 - 10 minutes for capture in maximum output setting if not successful initially.
- If capture present and patient remains hypotensive, increase rate of pacing.

2. STANDBY PACING:

- Turn the pacer on.

Precautions: *Pacemaker output may cause excessive pain/distress in the conscious patient. Consider administration of* ***MIDAZOLAM 2 to 4 mg IV and may repeat in 5-10 minutes to maximum of 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 maximum output is reached.

The Front Panel

The front panel of the X Series device includes the display screen, quick access keys, battery and auxiliary power indicators, Ready For Use (RFU) indicator, and the defibrillation front panel buttons: **PACER**, **ANALYZE**, **ENERGY SELECT**, **CHARGE**, and **SHOCK** ( ). See Figure 2-1. Refer to Table 2 on page 2-3 for information about the controls and indicators.

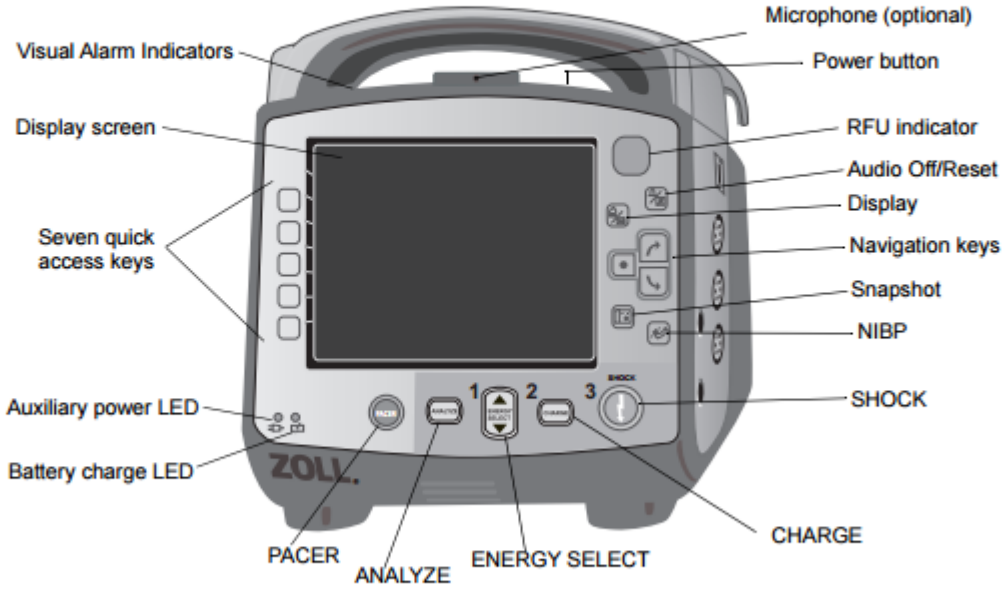


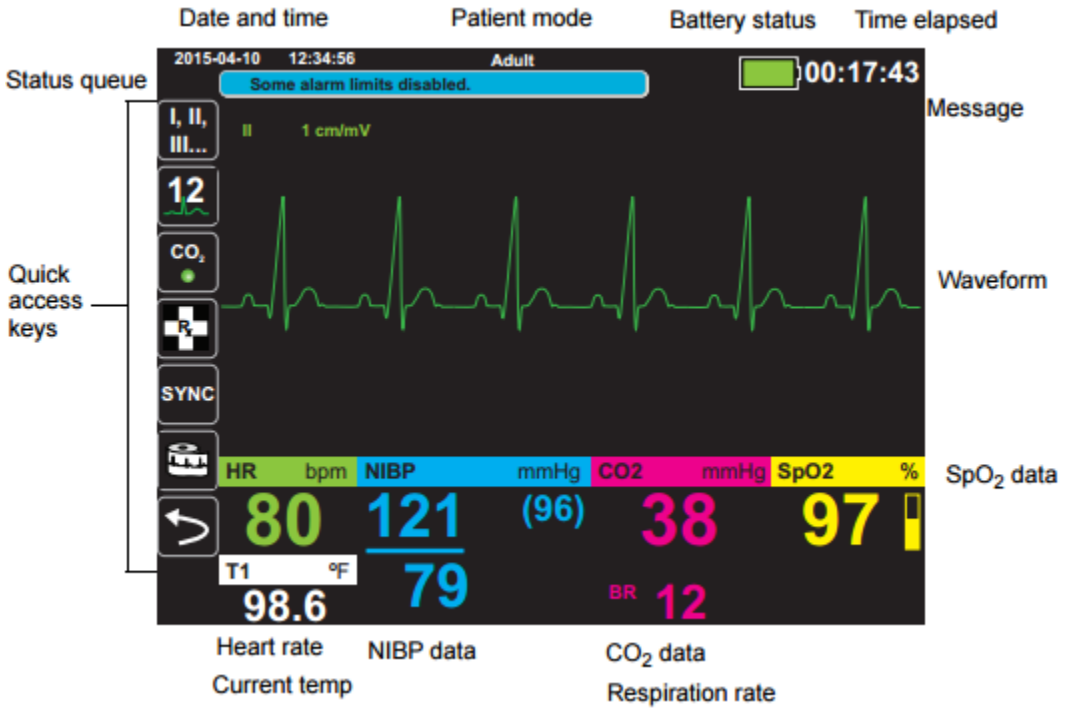
Figure 2-1 X Series Front Panel

Table 2: X Series Controls and Indicators

Control or Indicator	Description
Display screen	Shows therapeutic settings, physiological waveforms and other information for each monitored parameter, messages, time, and quick access key labels.
Quick access keys	Seven buttons control different functions of the unit. Labels for the quick access keys appear on the monitor display to the right of each key.
Auxiliary power LED	Illuminated when the unit is plugged in to an auxiliary power adapter.
Battery charge LED	Indicates battery status. Steady yellow: Battery is charging. Steady green: Battery is charged. Alternating green and yellow: The charge state cannot be determined or a battery charging fault has been detected. No light: Battery is not installed.
Visual alarm indicators	Red, yellow, and green lights located on the top of the unit that flash on and off when the unit is powered up and are used to indicate a patient alert, equipment alert, and data transfer.
PACER button 	Displays pacer settings window to start/stop pacing activity or change the rate, output, or mode settings.
ANALYZE button 	Displays in Manual mode only. Initiates ECG analysis to determine whether or not a shockable rhythm is present.
ENERGY SELECT buttons 	Two sets of up-down arrow buttons control the selection of defibrillator energy; one set is located on the front panel and the other set is located on the STERNUM paddle.
CHARGE Button 	Charges the defibrillator to the selected energy. In addition to the **CHARGE** button on the front panel, there is one located on the APEX paddle handle.
SHOCK Button 	The front panel **SHOCK** button is only active when using hands-free therapy electrodes or internal defibrillation paddles without a discharge button. The **SHOCK** button illuminates when the device is charged and ready. To discharge the defibrillator when using paddles (internal or external) with discharge buttons, press and hold the **SHOCK** buttons on the paddles.
NIBP button 	Starts/stops an NIBP measurement.
Snapshot button 	Records 24 seconds of numeric and waveform data.

Table 2: X Series Controls and Indicators (Continued)

Control or Indicator	Description
Navigation keys 	 The up (clockwise) arrow will cause the cursor to travel in an upward direction if the cursor is being used to navigate through a vertical list or in a clockwise direction if the cursor is being used to navigate around the full screen. Likewise, the down (counterclockwise) arrow will cause the cursor to travel in a downward direction if the cursor is being used to navigate through a vertical list or in a counterclockwise direction if the cursor is being used to navigate around the full screen. The up (clockwise) and down (counterclockwise) arrows may also be used to modify parameter settings.  The Select button acts based on what is highlighted.
Display/Home button 	Cycles through three available display modes or functions as a Home button when in a menu.
Audio Pause (Silence)/ Reset button 	Use to acknowledge a current alarm and pause (silence) the alarm audio for 90 seconds. Pressing **Audio Pause (Silence)/Reset** button before the Audio Pause (Silence) period has expired resets the alarm.
Ready for Use Indicator 	Shows the status of the unit, based on its most recent readiness check. A red circle with a line through it indicates that the unit's readiness has been compromised and that it may not be ready for therapeutic use.
Power button 	Located on the top of the unit, this button turns the unit on and off. **Note:** The X Series unit may display the message *Check Sensor* or *searching...* when the unit is powered on, but the SpO2 sensor has not yet been connected to the patient. If SpO2 monitoring is desired, connect the SpO2 sensor to the patient. See Chapter 10, "Pulse CO-Oximetry (SpO2)" for information on Sp02 monitoring.
Microphone (optional)	Records audio activity in the vicinity of the X Series unit.
Charge Indicator Light (not shown)	Located on the APEX paddle, this light turns on when the defibrillator is charged and ready.



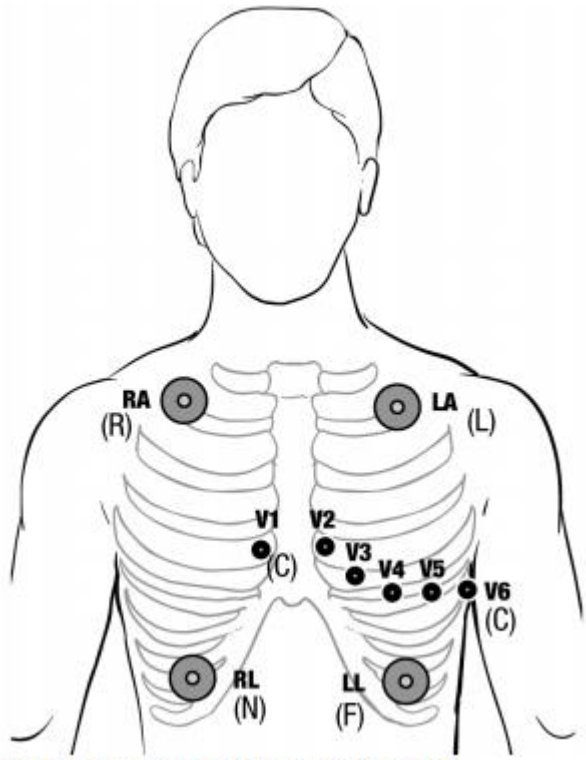


Figure 6-2 5-Lead Electrode Placement

Patient Cables and Connectors

The left and right sides of the unit include sets of connectors for patient cables.

Note: The SPO_2, NIBP, CO_2, Temperature, and IBP functions are optional. If your unit does not include these options, it does not have the applicable connectors.

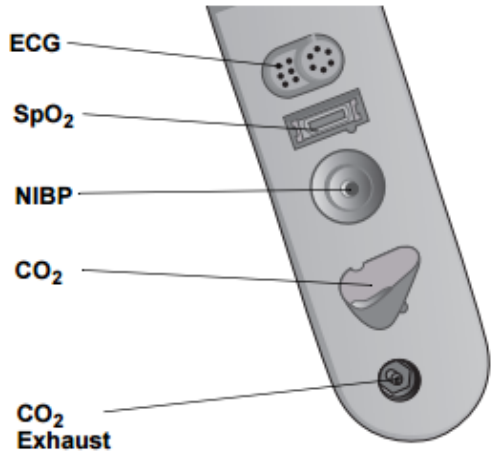


Figure 2-3 Patient Cable Connectors on Left Side of Unit

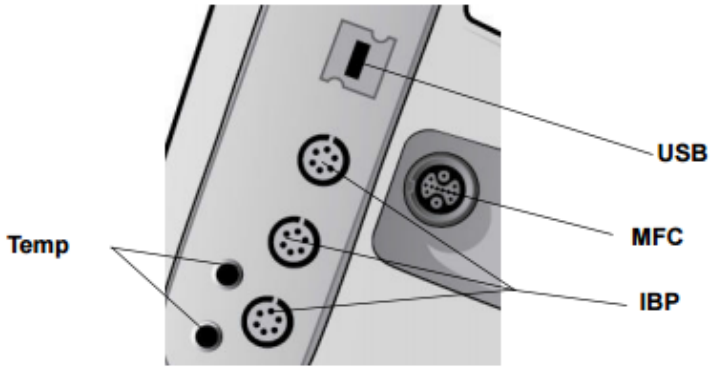


Figure 2-4 Patient Cable Connectors on Right Side of Unit

Connector	Description
ECG	For connecting 3- or 5-lead ECG cable (12-lead monitoring is optional).
SpO_2	For connecting Masimo SpO_2/CO cable.
NIBP	For connecting NIBP hose.
CO_2	For connecting CO_2 sampling line.
Temp	For connecting temperature probe(s).
Multifunction Cable (MFC)	For connecting paddles or ZOLL hands-free therapy and pacing electrodes.
USB	For connecting the X Series defibrillator to a USB device.
IBP	For connecting IBP cable(s).

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.922**
	PROCEDURE GUIDELINES **TITLE: LifePak 15 Monitor / Defibrillator**	**Effective Date 08/01/2020**

Area 1

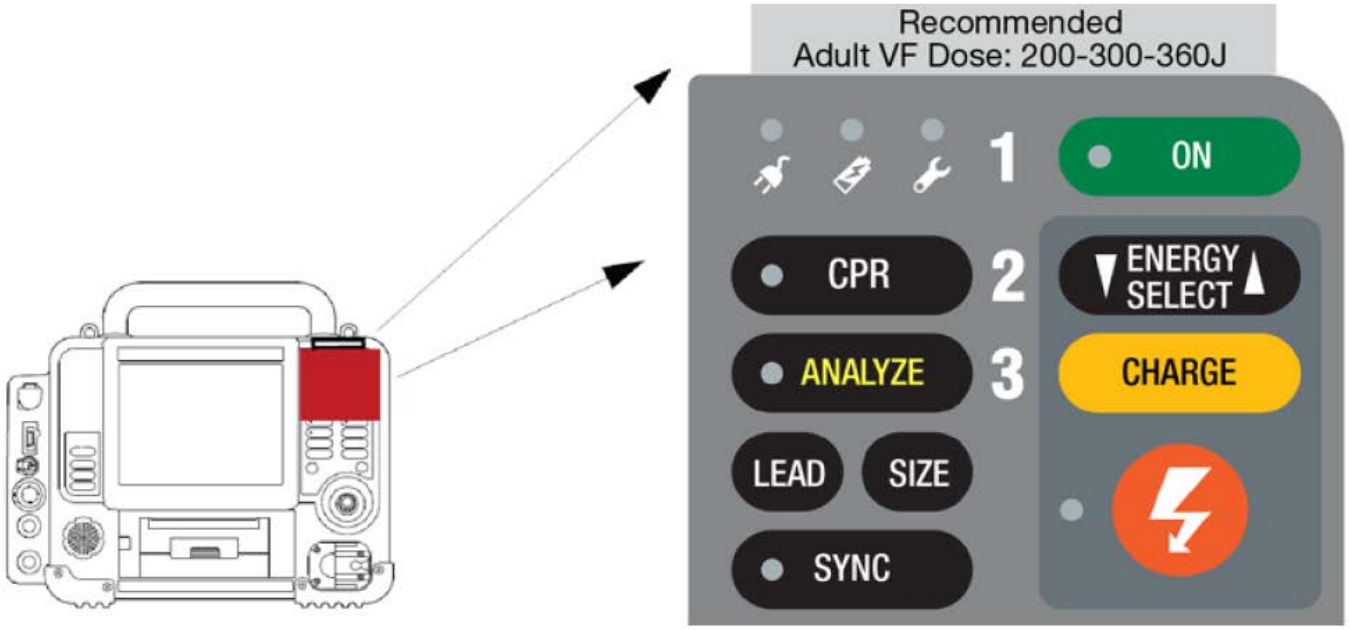


Table 1 Area 1 Controls

	CONTROL	DESCRIPTION
	VF dose label	Physio-Control recommended energy dose for adult Ventricular Fibrillation (VF).
1	ON	Turns device ON or OFF. LED illuminated when ON. Press and hold to turn device off.
2	ENERGY SELECT	Increases or decreases energy level in Manual mode.
3	CHARGE	Charges the defibrillator in Manual mode.
		Shock button. Initiates discharge of defibrillator energy to patient. LED flashes when charging is complete.
		Auxiliary power indicator. LED illuminated when defibrillator is connected to auxiliary AC or DC power source, whether defibrillator is turned on or off.
		Battery charging indicator. LED illuminated when installed batteries are fully charged. LED flashes when either battery is charging. LED is not illuminated when no batteries are installed or a battery is unable to be charged.
		Illuminated Service LED indicates a condition exists that prevents or could prevent normal defibrillator operation.
	CPR	Controls CPR metronome. LED illuminated when metronome function is active.
	ANALYZE	Activates Shock Advisory System™ (AED mode). LED illuminated when AED is analyzing the ECG, and flashes when user is prompted to push **ANALYZE**.
	LEAD	Changes ECG lead.
	SIZE	Changes ECG size.
	SYNC	Activates Synchronized mode. LED illuminated when Sync mode is active and flashes with detection of each QRS.

Area 2

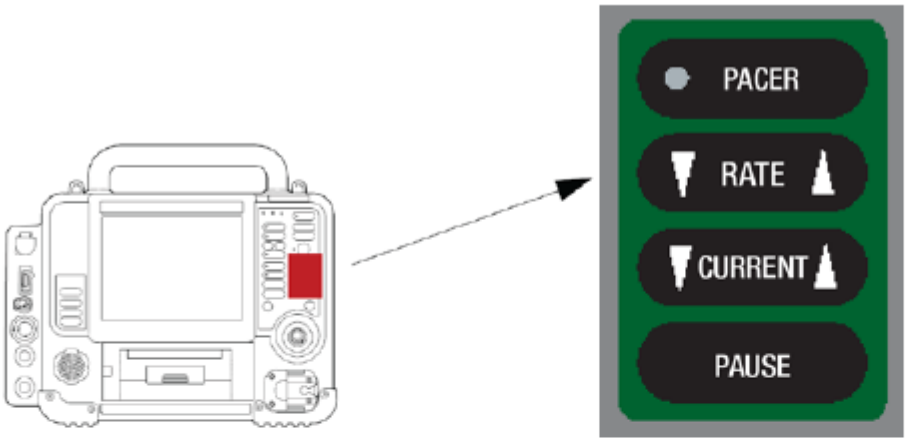


Figure 3 Area 2 Controls

Table 2 Area 2 Controls

CONTROL	DESCRIPTION	FOR MORE INFORMATION
PACER	Activates pacer function. LED illuminated when function is activated and flashes with each current pulse.	See Noninvasive Pacing (on page 141)
RATE	Increases or decreases pacing rate.	See Noninvasive Pacing (on page 141)
CURRENT	Increases or decreases pacing current.	See Noninvasive Pacing (on page 141)
PAUSE	Temporarily slows pacing rate.	See Noninvasive Pacing (on page 141)

Area 3

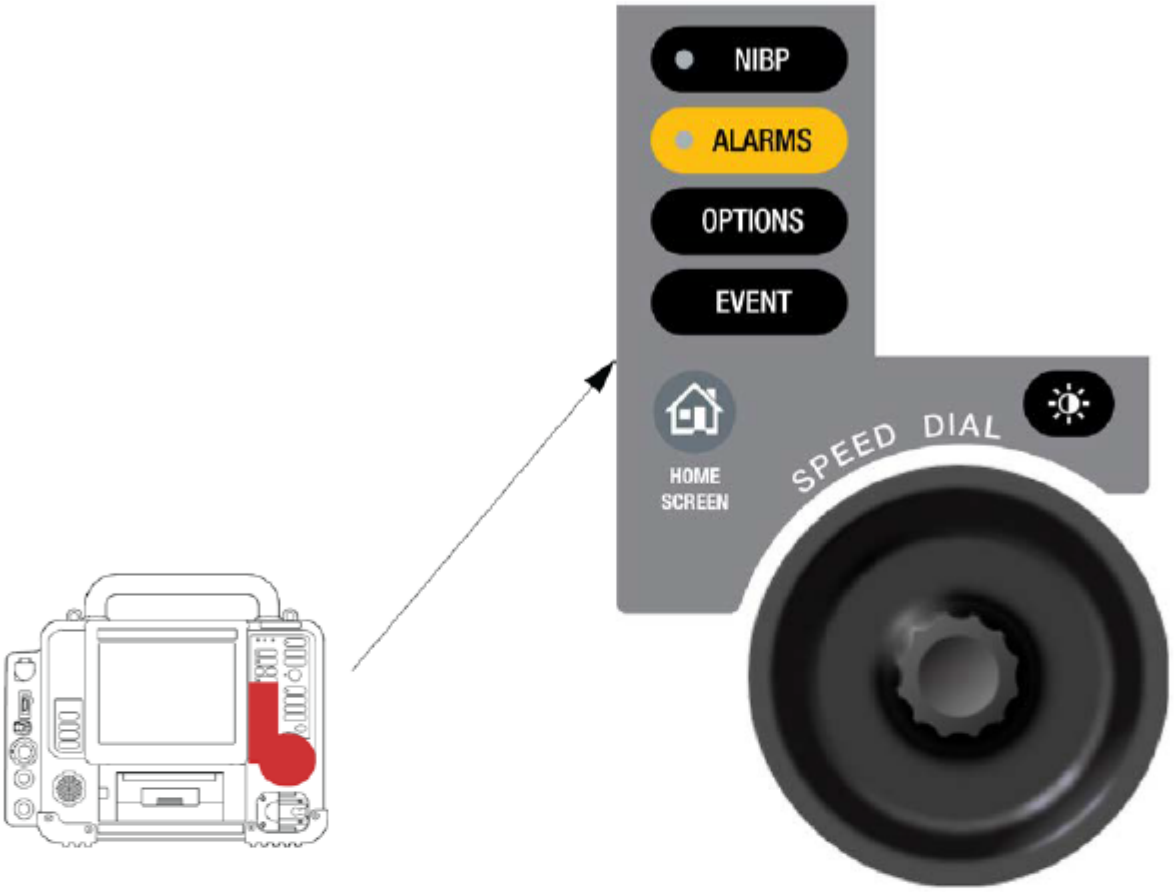


Figure 4 Area 3 Controls

Table 3 Area 3 Controls

CONTROL	DESCRIPTION	FOR MORE INFORMATION
NIBP	Initiates blood pressure measurement. LED illuminated when BP measurement is being obtained.	See Monitoring Noninvasive Blood Pressure (on page 79)
ALARMS	Activates and silences alarms. LED illuminated when alarms are enabled and flashes when an alarm condition occurs.	See Alarms (on page 39)
OPTIONS	Accesses optional functions.	See Options (on page 41)
EVENT	Accesses user-defined events.	See Events (on page 43)
HOME SCREEN	Returns to Home Screen display.	See Home Screen (on page 34)
SPEED DIAL	Scrolls through and selects screen or menu items.	See Navigating the Home Screen (on page 37)
	Display mode button switches between color display and high contrast SunVue™ display.	

Area 4

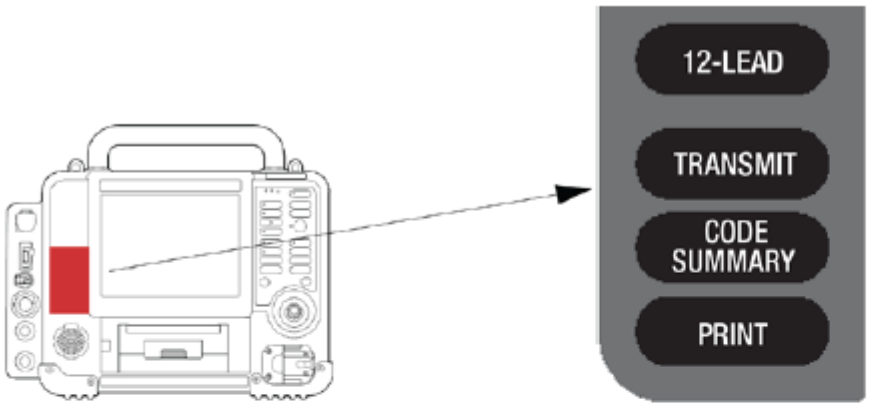


Figure 5 Area 4 Controls

Table 4 Area 4 Controls

CONTROL	DESCRIPTION	FOR MORE INFORMATION
12-LEAD	Initiates acquisition of 12-lead ECG.	See Acquiring a 12-Lead ECG (on page 58)
TRANSMIT	Initiates transmission of patient data.	See Transmitting Reports (on page 183)
CODE SUMMARY	Prints CODE SUMMARY™ critical event record.	See CODE SUMMARY Report (on page 162)
PRINT	Starts and stops printer.	See How to Print a Current Report (on page 167)

Area 5

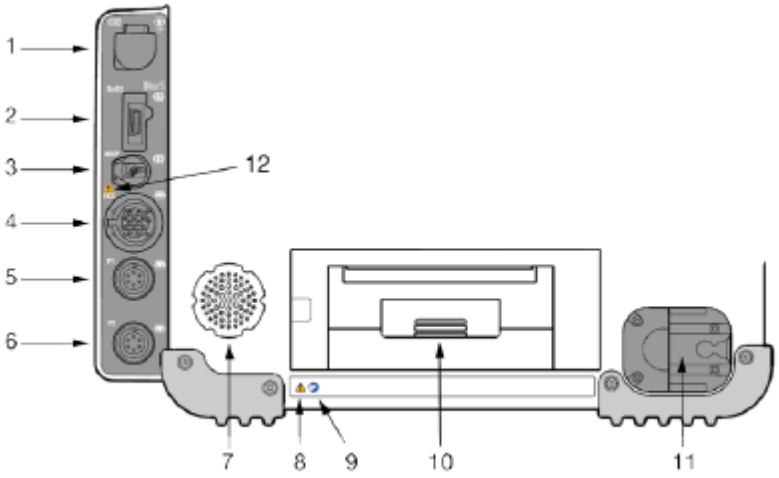


Figure 6 Area 5 Connectors, Speaker, and Printer

Table 5 Area 5 Connectors, Speaker, and Printer

ITEM	LABEL	DESCRIPTION
1	CO2	FilterLine® set port
2	SpO2/SpCO/ SpMet	Sensor cable port
3	NIBP	Pneumatic tubing port
4	ECG	Green electrically isolated ECG cable port
5	P1	Invasive pressure cable port
6	P2	Invasive pressure cable port
7	Speaker	Projects device tones and voice prompts
8	Symbol	General warning
9	Symbol	Follow instructions for use
10	Printer	Door for 100 mm printer paper
11	Therapy cable receptacle	QUIK-COMBO® therapy cable and standard (hard) paddles cable receptacle
12	Symbol	General warning

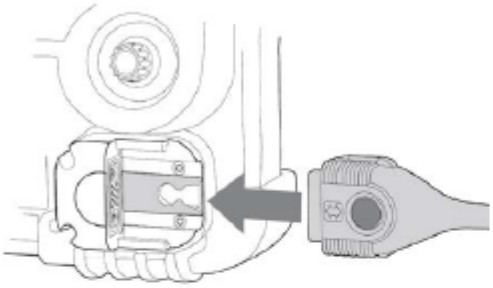
Connectors

CONNECTOR	ACTION
CO2	**Connect:** Open CO_2 port door, insert FilterLine connector, and turn clockwise until connector is firmly seated. **Disconnect:** Rotate FilterLine connector counterclockwise and pull connector out.
SpO2/ SpCO/ SpMet	**Connect:** Align cable connector with SpO_2 port and push in until connector clicks into place. **Disconnect:** Press the gray buttons on each side of the cable connector simultaneously and pull connector out.
NIBP	**Connect:** Insert NIBP tubing connector into the NIBP port. **Disconnect:** Press the latch on the left side of the port and pull tubing connector out.
ECG	**Connect:** Align the green ECG connector with the ECG port; position the white line on the cable facing left. Insert the cable connector into the port until the connector is firmly seated. **Disconnect:** Pull the ECG connector straight out.
P1/P2	**Connect:** Align the IP (invasive pressure) cable connector with the P1 or P2 port; position the gap on the connector facing up. Insert the cable connector into the port until the connector is firmly seated. **Disconnect:** Grip the connector and pull straight out.

Figure 7 Connectors for IP Monitoring Configuration

Note: If your LIFEPAK 15 monitor/defibrillator is configured for temperature monitoring, P1 and P2 are replaced by a single port labeled TEMP. For more information, see the following figure, Connectors for Temperature Monitoring Configuration.

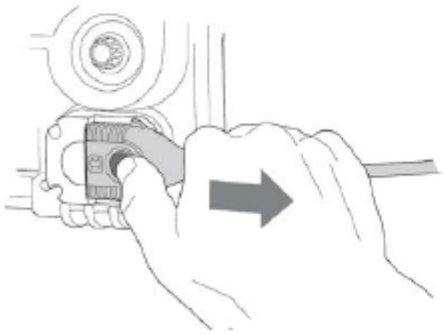
To connect a therapy cable to the defibrillator:



1. Align the therapy cable connector with the receptacle.
2. Slide the therapy cable until you feel the connector lock in place. You will also hear a "click."

Figure 9 Connect Therapy Cable

To disconnect the therapy cable from the defibrillator:



1. Press the release button on the therapy cable connector.
2. Slide the therapy cable connector out.

Figure 10 Disconnect Therapy Cable

Back View

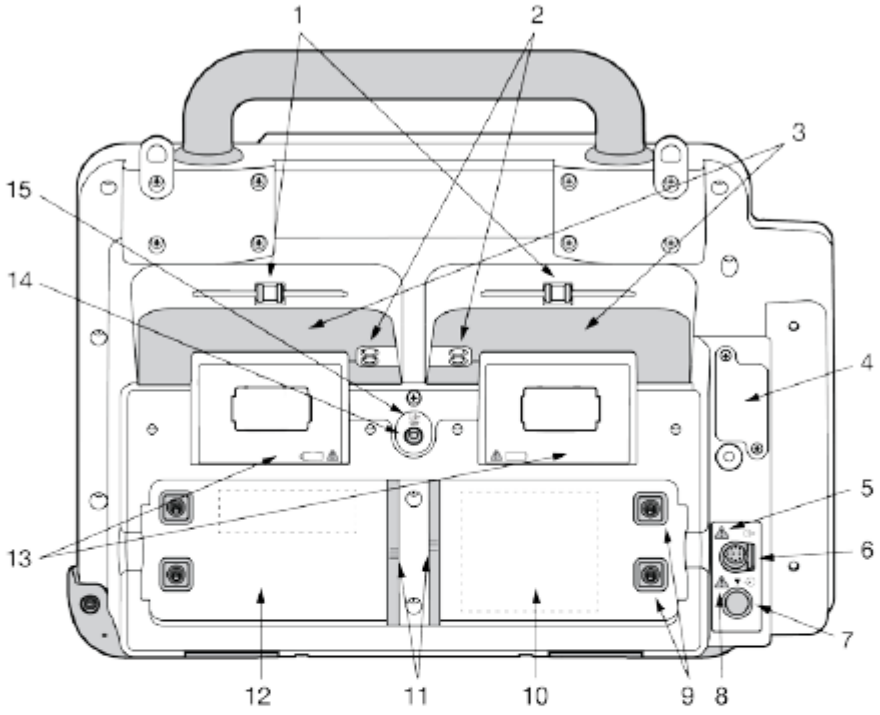


Figure 11 Back View

FIGURE LEGEND			
1	Paddle retainers	9	Battery pins
2	Paddle test contacts	10	Battery well 1; includes serial number label
3	Standard paddle wells	11	Battery contacts
4	USB port cover	12	Battery well 2; includes *Bluetooth* label
5	See shock hazard warning (on page 32)	13	See battery warnings (on page 209) and stored battery warning (on page 210)
6	System connector	14	CO_2 exhaust port
7	Auxiliary power connector	15	See $EtCO_2$ monitoring warnings (on page 87)
8	See power adapter warnings (on page 192) and battery warnings (on page 209)		

Table 6 Back View

LABEL	DESCRIPTION
Battery wells, pins, and contacts	Each well holds one Lithium-ion battery. Two pins in each well transfer the battery power. Battery contacts transfer battery status information. See serial number label in battery well 1 for device part number, serial number, date of manufacture, and IP rating (dust and splash resistance). See *Bluetooth* label in battery well 2 for *Bluetooth* identification. See Using *Bluetooth* Wireless Communication for more information.
CO_2 exhaust port	Connects to a scavenger system when monitoring $EtCO_2$ during use of anesthetics.
Standard paddle wells, retainers, and test contacts	Paddle wells stow standard (hard) paddles. Retainers provide secure retention and quick removal of the paddles. Test contacts allow complete paddles defibrillation checks according to the Operator's Checklist.
USB port cover	Protects USB port from the environment.
System connector	Connects device to a gateway or external computer for transfer of patient reports. Also provides real-time ECG output.
Auxiliary power connector	Connects to an optional AC or DC power adapter. Allows use of auxiliary power source.

Home Screen

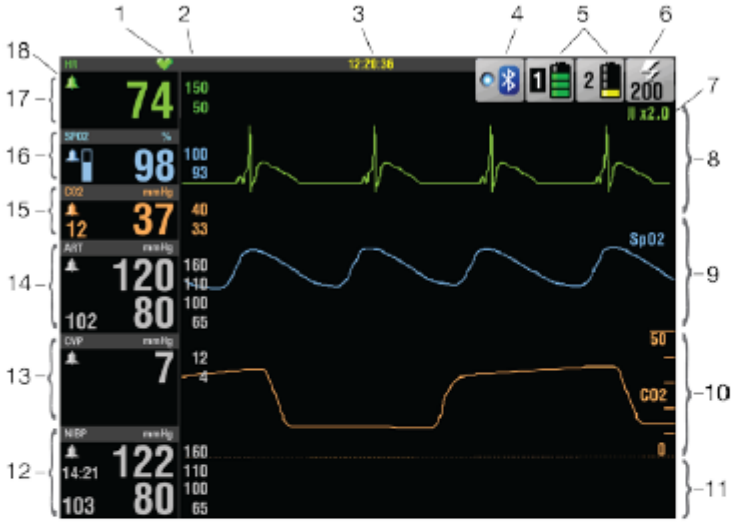


Figure 14 Home Screen

FIGURE LEGEND			
1	Heart symbol	10	Channel 3
2	Alarm limits	11	Message area
3	Time	12	NIBP
4	Bluetooth icon	13	IP2
5	Battery indicator	14	IP1
6	Selected energy	15	$EtCO_2$
7	ECG Lead/Size	16	SpO_2/SpCO/SpMet
8	Channel 1	17	Heart rate
9	Channel 2	18	Alarm indicator

Table 8 Battery Status Indicators

INDICATOR	MEANING	DESCRIPTION
	Active battery	The defibrillator is using the battery in well 1 for power. Battery status indicators display up to four green bars. Each green bar represents approximately 25% remaining charge. For example, three green bars indicate about 75% remaining charge.
	Low battery	Battery in well 1 is in use and is low. One yellow bar indicates 5% to 10% remaining charge.
	Very low battery	Battery in well 1 is in use and is very low. One red flashing bar indicates 0 to 5% remaining charge. The defibrillator automatically switches to the other battery only if adequate charge is available. If both batteries show red bars, the **REPLACE BATTERY** voice prompt occurs.
	Unrecognized battery	Battery in well 2 is not in use. Battery communication failed or a non-Physio-Control battery is installed. The battery may power the defibrillator but the level of charge is unknown and low battery messages and prompts will not occur.
	No battery installed or fault detected	No battery is installed in battery well 1, or a fault was detected in the battery in well 1 and the device will not use the battery.

AdventHealth Orlando	***AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care***	**Protocol Number 159.923**
	PROCEDURE GUIDELINES **C.A.T. Tourniquet** **Combat Application Tourniquet**	**Effective Date 08/01/2020**

INDICATIONS:

- Severe / Life Threatening Hemorrhage Control

COMPLICATIONS:

- Compartment Syndrome
- Embolism
- Fractures
- Pain
- Nerve Damage, Muscle Injury and Vascular Injury

1. PROCEDURE:

- Place the tourniquet 3 inches above the bleeding point.
- Pull the tourniquet tight and fasten the Velcro back onto itself.
- Twist the windlass rod until arterial bleeding has stopped and you are unable to palpate distal pulse.
- Place windlass rod into locking clip. Confirm arterial bleeding has stopped.
- If hemorrhage is not controlled consider additional tightening of windlass rod.
- Once arterial bleeding has stopped, secure rod in clip with rod strap.
- Record time and date of tourniquet application.

2. ADDITIONAL INFORMATION:

- The C.A.T. is to be applied to limbs only.
- Effective application of the C.A.T. is determined by the cessation of external hemorrhage. Keep in mind some oozing may still occur.
- C.A.T. may not be removed except by receiving Physician

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.924**
	TITLE: ZOLL AUTOPULSE	**Effective Date 08/01/2020**

The **ZOLL AUTOPULSE** Resuscitation System is designed for patient movement. Lending a hand to EMS personnel, this device allows for high-quality CPR during transport.

INDICATIONS:

- The **AUTOPULSE** is intended to be used as an adjunct to manual CPR, on adult patients only, in cases of clinical death as defined by a lack of spontaneous breathing and pulse.

AUTOPULSE PLATFORM:

- The **AUTOPULSE** Platform contains the mechanical drive mechanism, control system, and electronics necessary to generate and control the force required to perform mechanical chest compressions. User controls and indicators are contained in the User Control Panel.

LIFEBAND LOAD-DISTRIBUTING BAND:

- The LifeBand is a load-distributing band that consists of a cover plate and two bands integrated with a compression pad with a Velcro® fastener. Attached to the **AUTOPULSE** Platform, the LifeBand is automatically adjusted to the patient and provides compressions to the patient's chest in the region of the heart. The latex-free LifeBand is a single-use component that is attached to the **AUTOPULSE** Platform before each use.

DEPLOYING THE AUTOPULSE SYSTEM:

- In order to deploy the **AUTOPULSE** quickly and with the least interruption in cardiac compressions, a pit crew model - similar to that which is used in auto racing - is suggested for roles and positions of the staff involved in performing defibrillation and using the **AUTOPULSE**. Your local ZOLL representative can provide you with appropriate detailed instructions based upon the setting in which you work (EMS or hospital) and the number of clinicians that are typically involved in dealing with sudden cardiac arrest. Each organization should determine how this type of model can be integrated into the typical roles performed by members of their resuscitation team. Practice as a team using this model will help to streamline actions and ensure rapid, efficient deployment.

1. Power up the **AUTOPULSE**. The On/Off button is located on the top ("head") edge of the **AUTOPULSE** Platform.
2. The **AUTOPULSE** illuminates the green Power light-emitting diode (LED) on the User Control Panel and performs its self-tests (see Figure 3-2). Refer to the User Control Panel and its display panel during the operation of the **AUTOPULSE**. All operating information is available on the User Control Panel.
3. The **AUTOPULSE** indicates that it is ready for use.
4. After assessing the patient's condition, sit the patient up and make a single cut down the back of the patient's clothing (see Figure 3-4), or undo any ties on the back of the gown in a hospital. The posterior defibrillation/pacing pad may be placed on the patient's back at this time if the local protocol calls for anterior-posterior placement. Use of standard pads in both the a-p or anterior anterior/apex-sternum placement is acceptable and will not affect the operation of the **AUTOPULSE** or defibrillator.
5. Slide the **AUTOPULSE** Platform into position behind the sitting patient and lay the patient down onto the Platform. Placing the **AUTOPULSE** to the patient's side and "log rolling" him or her onto the Platform is an acceptable alternative.
6. Grasp the clothing by the sleeves and pull down toward the ankles to remove all of the clothing from both the front and back of the torso (see Figure 3-5). The anterior pad(s) may be placed at this time.
7. Position the patient so that he/she is centered laterally (from left to right) and that the armpits are aligned with the **AUTOPULSE** using the yellow line positioning guides on the platform.
8. Close the LifeBand around the patient's chest.

STARTING CHEST COMPRESSIONS:

1. Make sure that the yellow upper edge of the LifeBand is aligned with the patient's armpits and is directly over the yellow line on the **AUTOPULSE** Platform. Also make sure that there are no obstructions, such as clothing, straps or equipment, with the bands.
2. Press and release the Start/Continue button once. The **AUTOPULSE** automatically adjusts the bands to the patient's chest.
3. The **AUTOPULSE** will pause for 3 seconds to allow you to verify that the patient is properly aligned and that the LifeBand has taken up any slack in the bands
4. After the 3 second verify patient alignment pause is complete, compressions will automatically begin. You may press the Start/Continue button to immediately initiate compressions ahead of that time.
5. Depending on the Mode setting in Administrative Menu (refer to section Section 2.3, "Administrative Menu: User Pre-set Options," on page 2-10), the **AUTOPULSE** will perform 30:2, 15:2 or Continuous compressions. In 30:2 mode it performs 30 compressions and then pauses for three seconds to permit the user to ventilate the patient before automatically resuming compressions (see Figure 3-12). In 15:2 mode it performs 15 compressions and then pauses for three seconds to permit the user to ventilate the patient before automatically resuming compressions (see Figure 3-12). In Continuous mode it performs continuous compressions. If 30:2 on-the-fly mode switching has been enabled (in the Mode setting within the Administrative Menu) then the **AUTOPULSE** will perform in the mode (either 30:2 or Continuous) that was used last until powered down; on power up 30:2 will be the initial selection. If 15:2 on-the-fly mode switching has been enabled (in the Mode setting within the Administrative Menu) then the **AUTOPULSE** will perform in the mode (either 15:2 or Continuous) that was used last until powered down; on power up 15:2 will be the initial selection.

6. If 30:2 on-the-fly mode switching has been enabled, you may press the gray Menu/Mode switch button to switch between 30:2 and continuous compressions. If 15:2 on-the-fly mode switching has been enabled, you may press the gray Menu/Mode switch button to switch between 15:2 and continuous compressions. The current mode is displayed in the upper left corner of the screen. The words above the gray Menu/Mode switch button indicate the alternate mode that the **AUTOPULSE** will switch to. If there are no words above the gray button then on-the-fly mode switching is not enabled, and the device will only operate in the current mode and pressing the gray button will have no effect.
7. To access the patient or to pause the **AUTOPULSE** for any reason, press the Stop/Cancel button. The **AUTOPULSE** Platform releases the tension on the LifeBand, allowing the user to pull the bands to the maximum extended position. 10 seconds after the Stop/Cancel button has been pressed a single audio alert tone will sound. Three audio alert tones will sound 20 seconds after the pause was initiated. Audio alert tones will sound continuously after 30 seconds into the pause. The tones can be temporarily disabled (and re-enabled) by pressing the Tone Mute button, "Tone Mute Button," if this function is allowed in the Administrative Menu. Pressing the Stop/Cancel button while paused will exit the paused state and the alert tone will be stopped.
8. To restart compressions, press the CONTINUE button as described in the procedure starting at step 1.

ENDING ACTIVE DEVICE USE:

1. After either successful resuscitation or termination of activities, press the Stop/Cancel button followed by the On/Off button. The Stop/Cancel button action will cease the compression cycles and relax the LifeBand. The On/Off button action will power down the **AUTOPULSE**.
2. Open the Velcro® fastener and lift or log roll off the patient from the **AUTOPULSE** Platform, as necessary.

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Interfacility Care*	**Protocol Number 159.925**
	PROCEDURE GUIDELINES **BAC-Pack – Surgical Cricothyrotomy**	**Effective Date 11/01/2021**

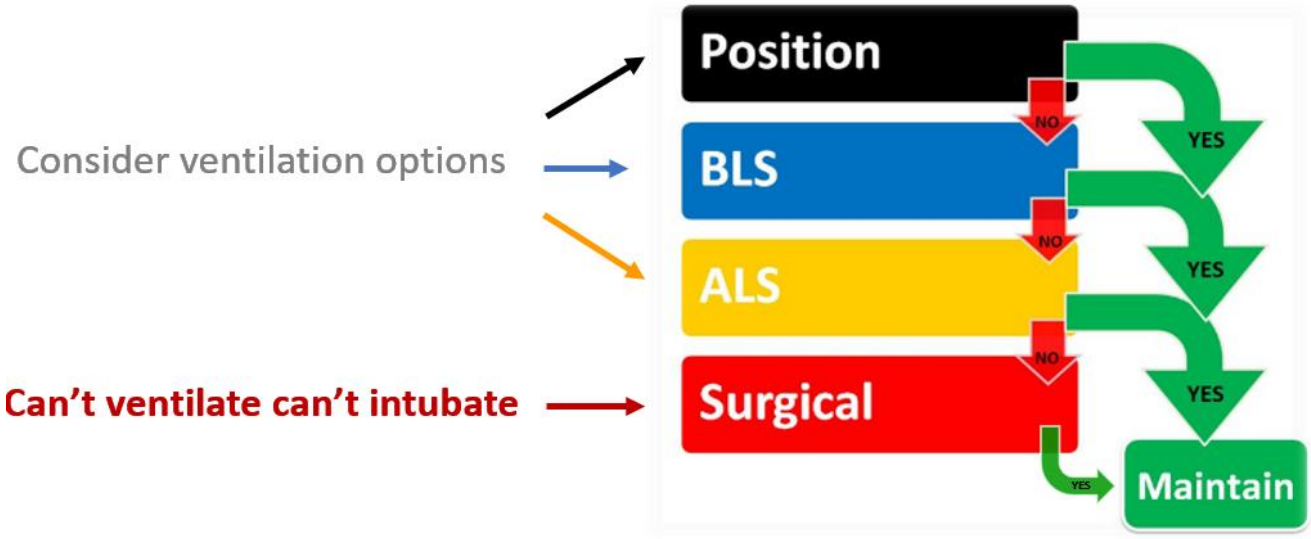
INDICATIONS:

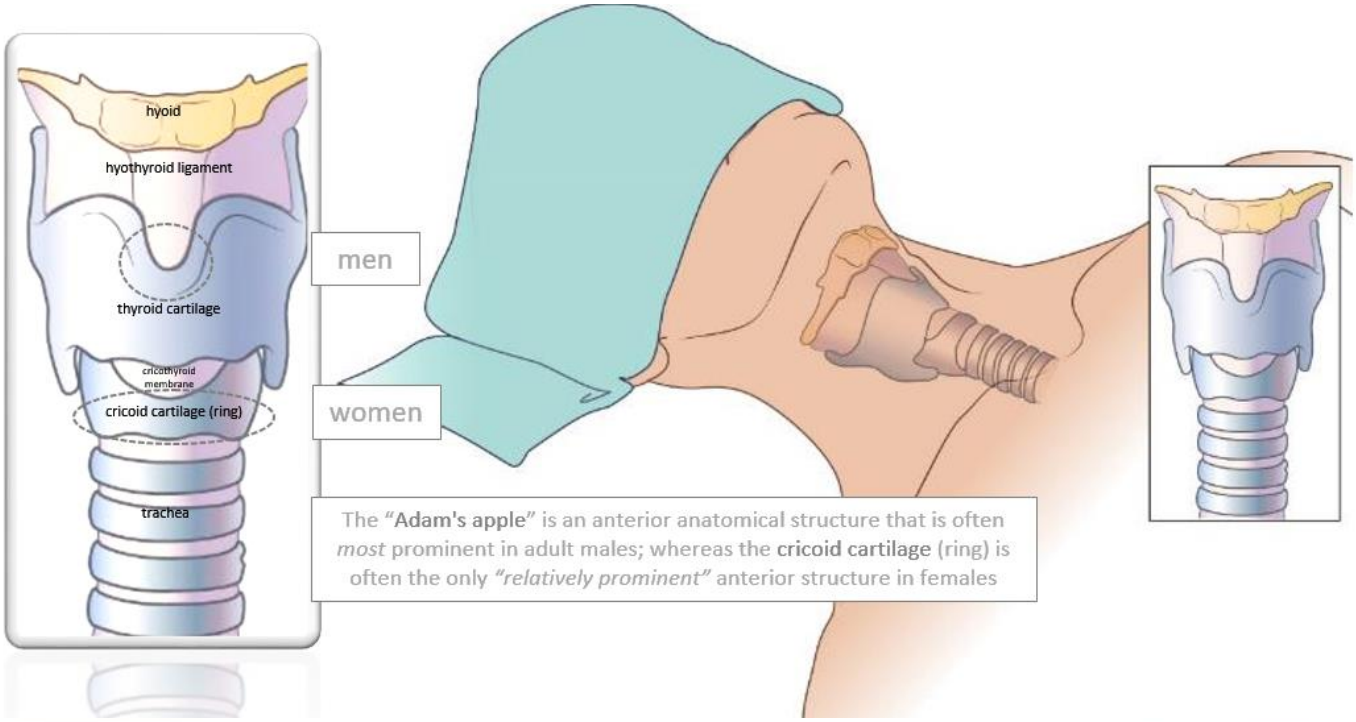
- inability to ventilate or intubate by non-surgical methods
- BAC-Pack™ is intended for the placement of a surgical airway when all positioning, basic, and advanced ventilation attempts have failed this situation can be summarized in four words: can't ventilate can't intubate *from which only two options remain:*

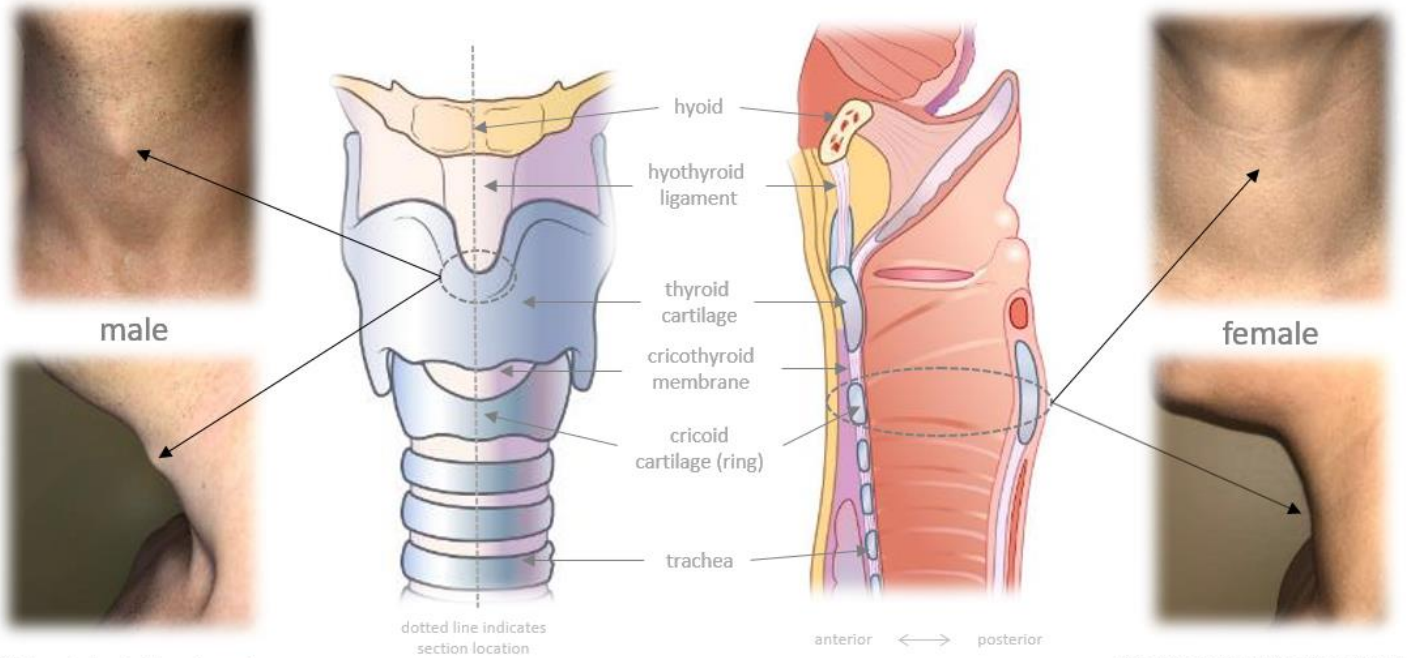
A SUCCESSFUL SURGICAL AIRWAY

or

DEATH

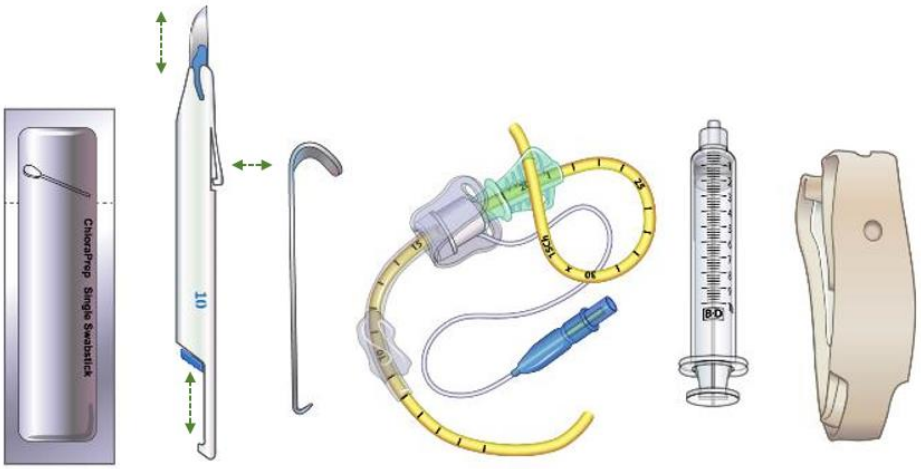




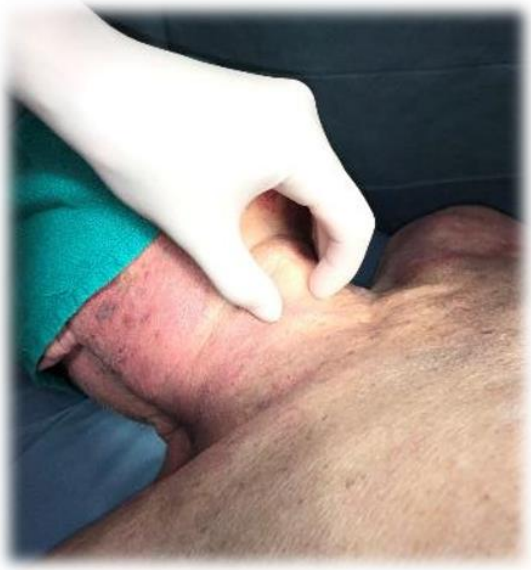


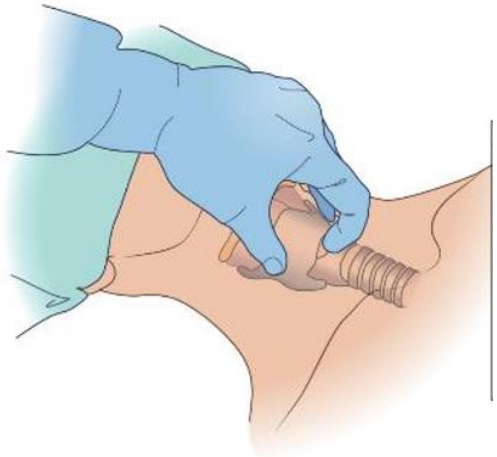
"Adam's Apple" is often the most palpable structure on men

Cricoid cartilage is often the only palpable structure on women



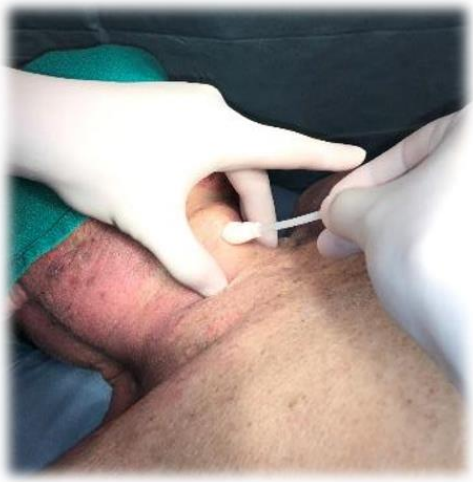
STEP 1. Prepare equipment

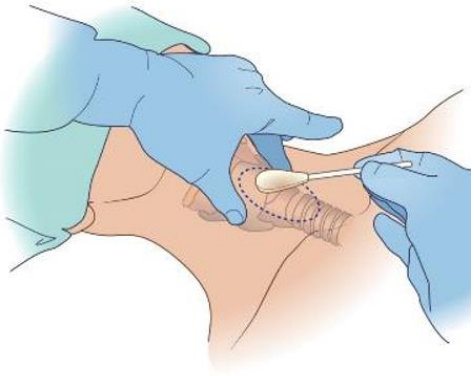




STEP 2. Stabilize and locate anatomy

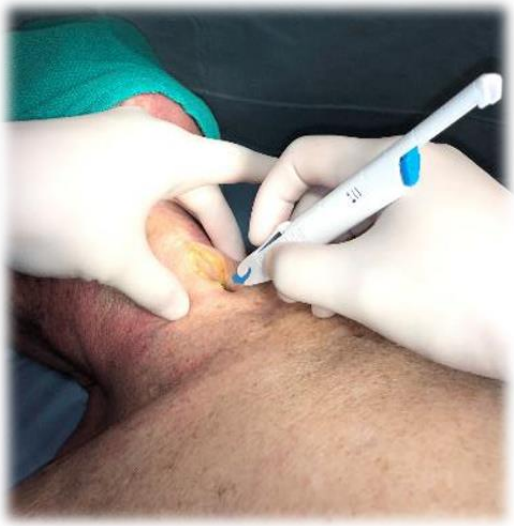
*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE

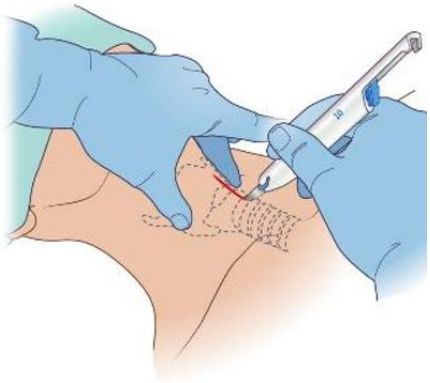




STEP 3. Cleanse site

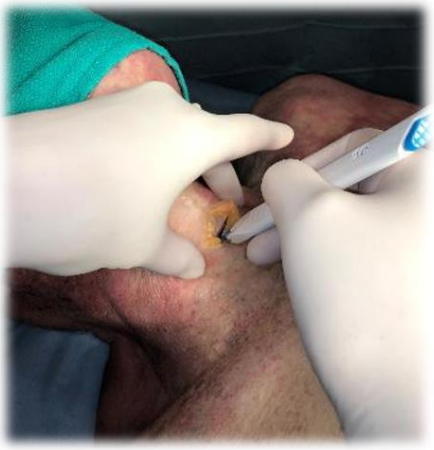
*this series depicts a RIGHT-HANDED operator on patient's RIGHT SIDE

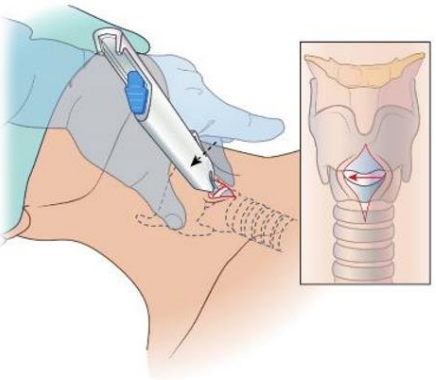




STEP 4. Vertically incise external tissues

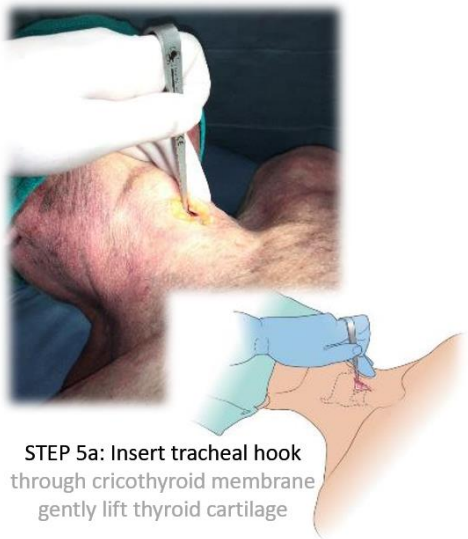
*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE



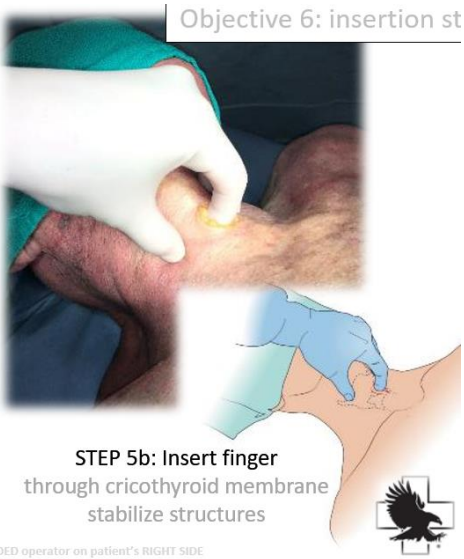


STEP 5. Horizontally incise cricothyroid membrane

*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE

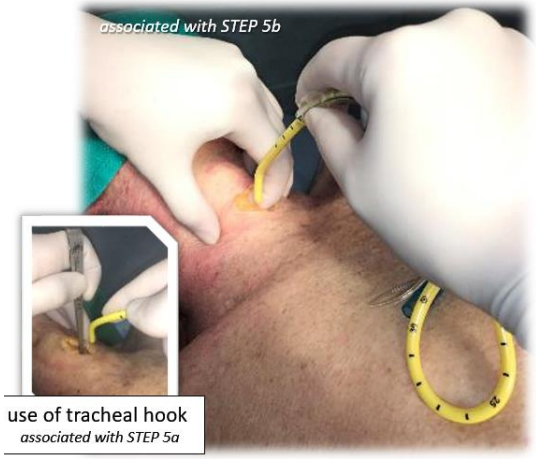


STEP 5a: Insert tracheal hook
through cricothyroid membrane
gently lift thyroid cartilage

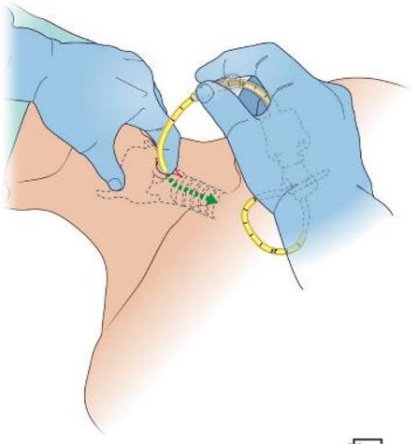


STEP 5b: Insert finger
through cricothyroid membrane
stabilize structures

*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE



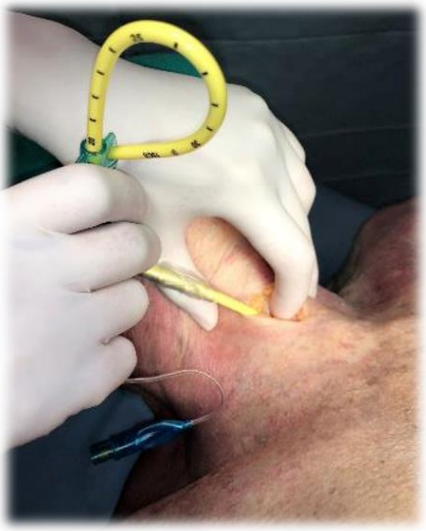
use of tracheal hook
associated with STEP 5a

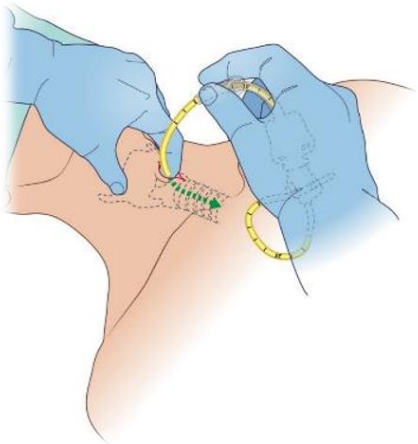


STEP 6. Insert bougie through cricothyroid membrane

*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE

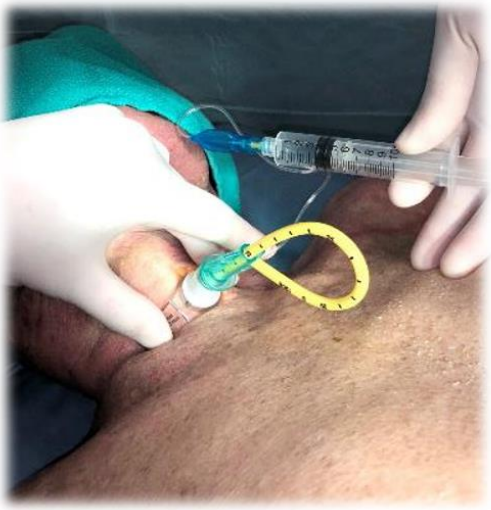
Objective 6: insertion steps

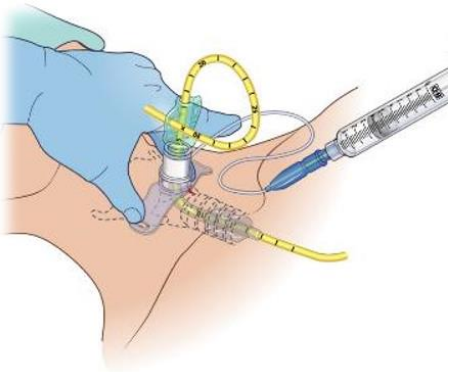




STEP 6. Insert bougie with tactile confirmation

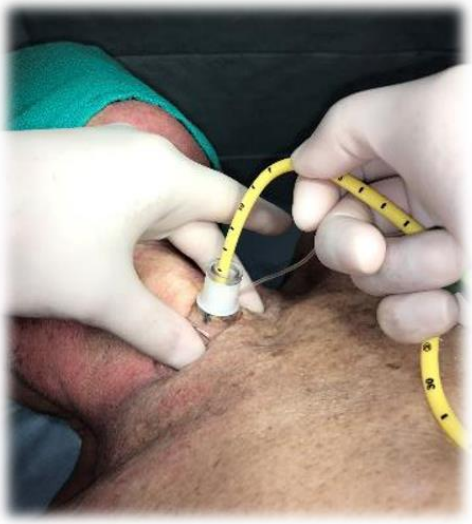
*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE

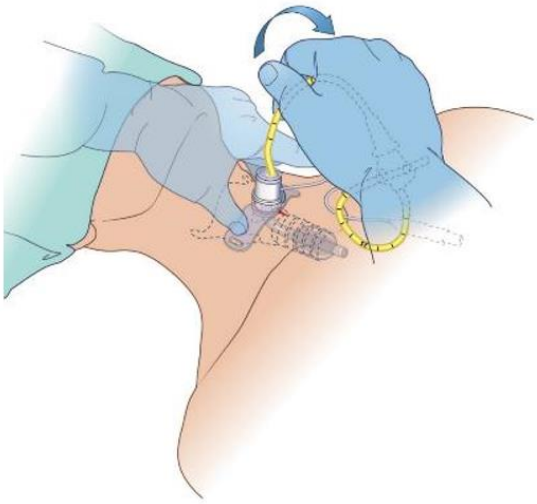




STEP 7. Advance tube & inflate cuff

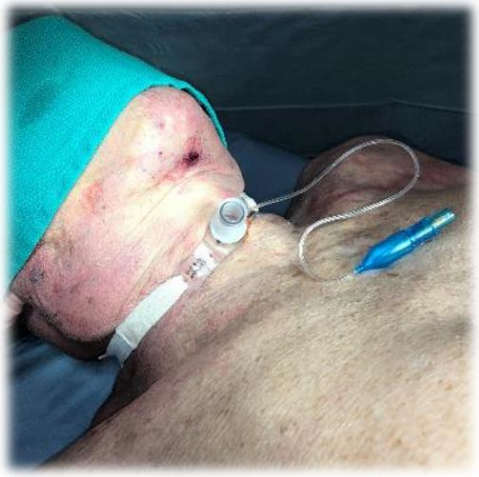
*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE

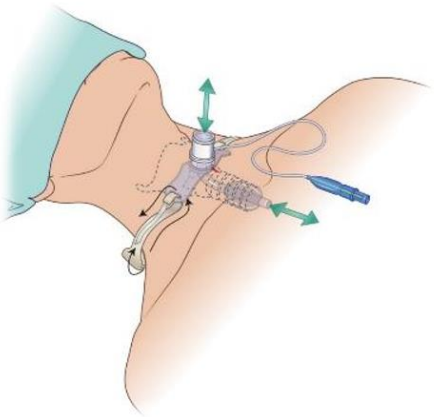




STEP 8. Remove bougie

*this slide depicts a RIGHT-HANDED operator on patient's RIGHT SIDE





STEP 9. Secure tube and ventilate

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Interfacility Care*	**Protocol Number 159.926**
	PROCEDURE GUIDELINES **Flow-Safe II+ Bi-Level CPAP / BiPap System**	**Effective Date 11/01/2021**

AdventHealth Orlando	*AdventHealth EMS Department Guidelines for Interfacility Care*	**Protocol Number 159.926**
	PROCEDURE GUIDELINES **Flow-Safe II+ Bi-Level CPAP / BiPap System**	**Effective Date 11/01/2021**

ONLY ONE

FLOW-SAFE II +®

Disposable **BiLevel** CPAP System

How the System Works

By connecting the Flow-Safe II+® BiLevel CPAP System to a flowmeter/regulator start with the green knob in the CPAP position. By adjusting flow rates up and down, various CPAP pressures can be achieved and verified with the manometer.

CONNECT TO FLOW SOURCE ONLY

FLOW-SAFE II + Disposable **BiLevel** CPAP System

Flow (LPM)	CPAP MODE (cm H_2O)
6	2.0 - 3.0
10	6.0 - 7.0
12	8.0 - 9.0
15	11.0 - 12.0

CAUTION: CPAP pressure will decrease when **BiLevel** is activated & increase when **BiLevel** is deactivated. Verify CPAP pressure with manometer & adjust flowmeter as needed.

CONNECT TO FLOW SOURCE ONLY

FLOW-SAFE II + Disposable **BiLevel** CPAP System

Flow (LPM)	BiLevel MODE (cm H_2O)
14	8 - 9 IPAP
15	9 - 10 IPAP
16	11 - 12 IPAP
17 (MAX)	12 - 13 IPAP

CAUTION: CPAP pressure will decrease when **BiLevel** is activated & increase when **BiLevel** is deactivated. Verify CPAP pressure with manometer & adjust flowmeter as needed.

For BiLevel therapy, simply switch the green knob to the BiLevel position. The CPAP pressure now becomes the Inspiratory Positive Airway Pressure (IPAP). Adjust the blue EPAP knob to obtain desired Expiratory Positive Airway Pressure.

Flow-Safe II® Disposable CPAP Therapy System Compared to Non-invasive Mechanical Ventilation

American Journal of Emergency Medicine

Is the flow-safe disposable continuous positive airway pressure (CPAP) system as effective as non-invasive mechanical ventilation (NIMV) in the treatment of acute cardiogenic pulmonary Oedema?

İlhan UZ, MD[a,*], Güçlü Selahattin KİYAN, MD[a], Enver ÖZÇETE, MD[a], Sercan YALÇINLI, MD[a], Mehmet Birkan KORGAN, MD[a], Yusuf Ali ALTUNCI, MD[a], Murat ERSEL, MD[a], Funda Karbek AKARCA, MD[a], Oğuz YAVUZGİL, MD[b]

According to this recent American Journal of Emergency Medicine, For acute cardiogenic pulmonary oedema, (ACPO) patients, the Flow-Safe® Disposable CPAP device is "as effective as NIVM, in improving blood pressure, pulse, respiratory rate and blood gas."

Flow-Safe II, Flow-Safe II EZ® and Flow-Safe II+ can be solutions for situations where non-invasive mechanical ventilation equipment is scarce or unavailable.

ORDERING INFORMATION

Part #	Description	Packaged
#10-57400	Flow-Safe II+ BiLevel CPAP w/ Large Adult Full Face Mask w/ Straight Swivel Port & Headstrap	5/Box
#10-57401	Flow-Safe II+ BiLevel CPAP w/ Medium/Small Adult Full Face Mask w/ Straight Swivel Port & Headstrap	5/Box
#10-57402	Flow-Safe II+ BiLevel CPAP w/ Small/Child Full Face Mask w/ Straight Swivel Port & Headstrap	5/Box
#10-57403	Flow-Safe II+ BiLevel CPAP w/o Mask	5/Box

AdventHealth Orlando	*AdventHealth EMS / AdventHealth Flight 1 Protocol Guidelines for Medical Care*	**Protocol Number 159.927**
	TITLE: AEROGEN CONTROLLER	**Effective Date 11/01/2021**

Classification of Transport: CC / Flight

Aerogen Pro System

The Aerogen Pro System includes the following components:

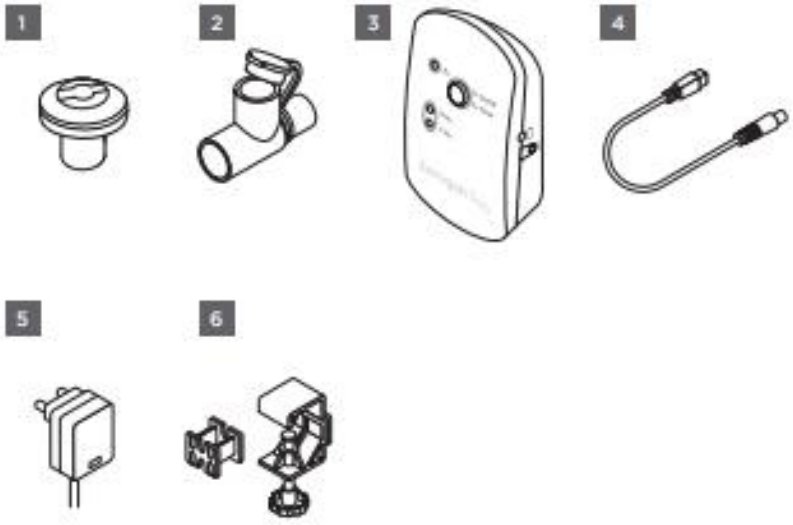


Figure 1. Aerogen Pro System

1. Nebulizer with Filler Cap
2. T-Piece (Adult) with Plug
3. Aerogen Pro Controller
4. Controller Cable
5. AC/DC Adapter
6. Universal Mounting Bracket & Equipment Mount Adapter

Note: Visit www.aerogen.com for full parts list.

Aerogen Pro Controller

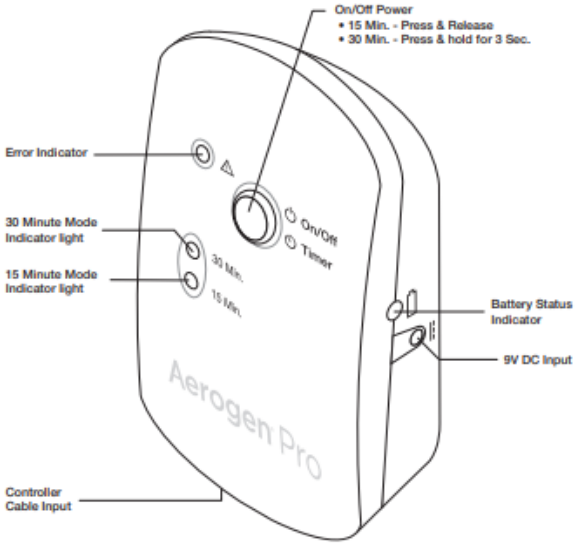


Figure 2. Aerogen Pro Controls & Indicators

Table 1. Aerogen Pro Controls & Indicators

Control / Indicator	Function
15 Min. Indicator	• Green (steadily lit) = 15 Minute nebulization cycle on • Green (flashing) = Low battery power • Nebulizer automatically powers off after 15 minutes have elapsed
30 Min. Indicator	• Green (steadily lit) = 30 Minute nebulization cycle on • Green (flashing) = Low battery power • Nebulizer automatically powers off after 30 minutes have elapsed
Error Indicator	• Amber = Faulty electrical connection
On/Off Power Button	• To operate in 15 Minute Mode, press and immediately release the On/Off button • To operate in 30 Minute Mode, press and hold the On/Off button for at least 3 seconds from off • Pressing during nebulization turns off power to the nebulizer
Battery Status Indicator	• Green = Battery fully charged • Amber = Battery charging • No light = Battery in operation

Assembly & Installation

Aerogen Pro System Set-Up

Clean and sterilize the nebulizer and T-piece(s) as described in the Cleaning, Disinfection and Sterilization section of this manual.

Note: The nebulizer and T-piece, as packaged, are not sterile.

1. Perform a functional test of Aerogen Pro before use and between patients as described in the Functional Test section of this manual (see page 19).

2. Insert the filler cap into the opening on the nebulizer.

3. Connect the nebulizer to the T-piece by pushing the nebulizer firmly onto the T-piece (Figure 3).

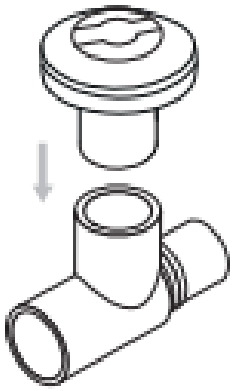


Figure 3. Connecting nebulizer to T-piece

4 Connect the Aerogen Pro controller and the nebulizer together using the controller cable (Figure 4).

Figure 4. Connecting controller and nebulizer

5 To operate on AC power (the primary mode of operation), connect the Aerogen Pro AC/DC adapter to the Aerogen Pro controller and plug the adapter into an AC power source (Figure 5).

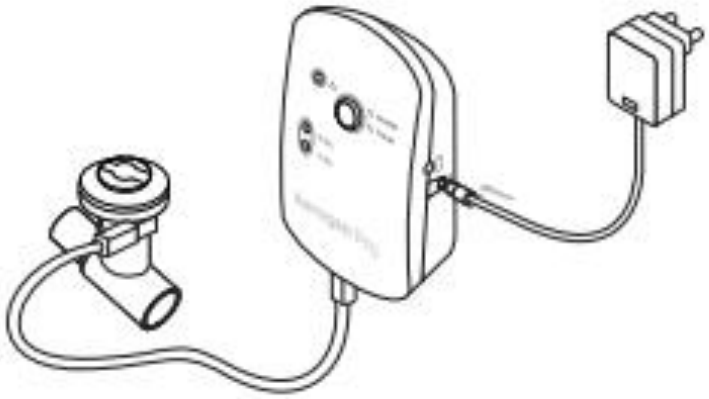


Figure 5. Connecting the AC/DC Adapter

Installation for use with a Ventilator

Connection to a Breathing Circuit

1. For **adult breathing circuits**, connect the nebulizer with adult T-piece into the inspiratory limb of the breathing circuit before the patient Y (Figure 6).

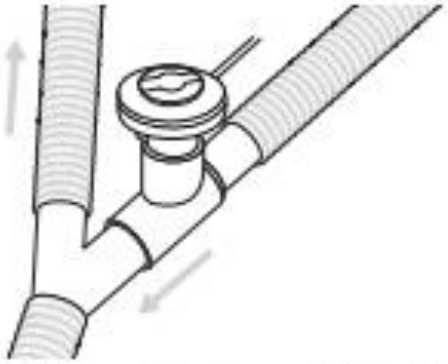


Figure 6. Connecting the Aerogen Pro to an adult breathing circuit

Note: Figure 6 shows adult configuration only

For **pediatric breathing circuits**, connect the nebulizer with the pediatric T-piece into the inspiratory limb of the breathing circuit before the patient Y (Figure 7).

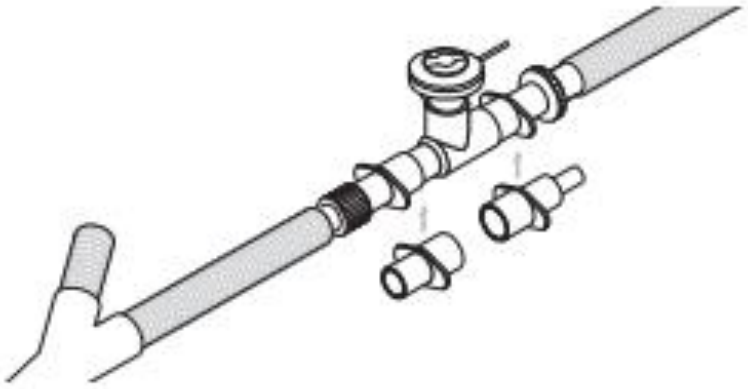


Figure 7. Connecting to a 12 mm I.D. pediatric breathing circuit

Adding Medication

- Open the filler cap tab on the nebulizer.
- Use a pre-filled ampoule or syringe to add medication into the filler port of the nebulizer (Figure 10).
- Close the filler cap tab.

Warning: To avoid damage to the nebulizer, do not use a syringe with a needle.

The maximum capacity of the nebulizer is 10 mL. Do not fill the nebulizer beyond the maximum fill indication point (Figure 10). The underside of the filler cap represents maximum fill indication point.

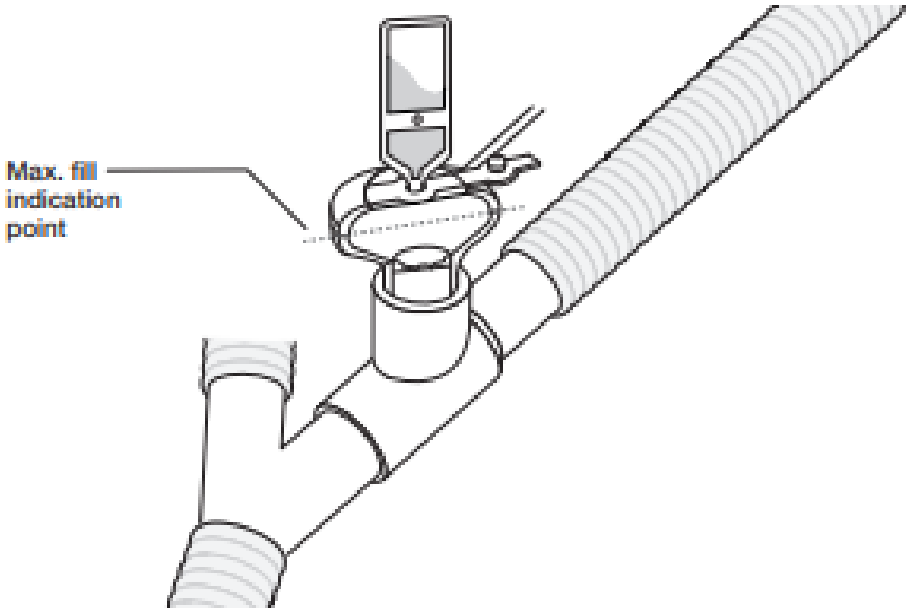


Figure 10. Filling the nebulizer with a pre-filled ampoule

Note: Medication can be added in this manner during nebulization. This does not interrupt nebulization or ventilation.

Nebulization

For doses less than or equal to 3 mL.

1. To start a 15 Minute nebulization cycle, add the medication and press and release the blue On/Off power button (Figure 2). The green 15 Min. indicator lights to indicate that the 15 Minute nebulization cycle is in progress.

For doses greater than 3 mL.

2. To start a 30 Minute nebulization cycle, add the medication and press and hold the blue On/Off power button for at least three seconds. The green 30 Min. indicator lights to indicate that the 30 Minute nebulization cycle is in progress.
3. To stop the nebulizer at any time, press the On/Off power button. The indicator turns off to indicate that nebulization has stopped.

Note: When delivering a dose greater than 3 mL, select the 30 Minute cycle.

Pediatric Emergency ABC's and More*

http://www.emlrc.org/flpedready/

Last updated 05/03/2019

AIRWAY

Airway Equipment

ZONE	3 kg	4 kg	5 kg	PIN	RED	PUR	YEL	WHI	BLU	ORG	GRN
Weight (kg)	3	4	5	6-7	8-9	10-11	12-14	15-18	19-23	24-29	30-36
ET Tube (mm)	3.5 unc/ 3.0 cuff	3.5 unc/ 3.0cuff	3.5 unc/ 3.0 cuff	3.5 unc/ 3.0 cuff	3.5 unc/ 3.0 cuff	4.0 unc/ 3.5 cuff	4.5 unc/ 4.0 cuff	5.0 unc/ 4.5 cuff	5.5 unc/ 5.0 cuff	5.5 cuff	6.0 cuff
Lip-Tip (cm)	9-9.5	9.5-10	10-10.5	10-10.5	10.5-11	11-12	12.5-13.5	14-15	15.5-16.5	17-18	18.5-19.5
Suction	8F	8F	8F	8F	8F	8-10F	10F	10F	10F	10F	12F
L-Scope blade	1 St.	1 St.	1 St.	1 St.	1 St.	1 St.	2 St./Cvd.	2 St./Cvd	2 St./Cvd	2-3 St./Cvd.	2-3 St./Cvd.
Stylet	6F	6F	6F	6F	6	6F	10F	10F	10F	14F	14F
Oral Airway	50mm	50mm	50mm	50mm	50mm	60mm	60mm	60mm	70mm	80mm	80mm
NP Airway	14F	14F	14F	14F	14F	18F	20F	22F	24F	26F	26F
BVM (min vol mLs)	450	450	450	450	450	450	450	450-750	750-100	750-1000	1000
LMA	1	1	1	1.5	1.5	2	2	2	2-2.5	2.5	3

Unc = uncuffed

AGE ESTIMATION CHART

COLOR	WEIGHT	AGE
GREY	3-5 kg	< 3 mo
PINK	6-7 kg	3-5 mo
RED	8-9 kg	6-11 mo
PURPLE	10-11 kg	12-24 mo
YELLOW	12-14 kg	2 yrs
WHITE	15-18 kg	3-4 yrs
BLUE	19-23 kg	5-6 yrs
ORANGE	24-29 kg	7-9 yrs
GREEN	30-36 kg	10-11 yrs

RSI MEDICATIONS

ZONE	3 kg	4 kg	5 kg	PINK	RED	PUR	YEL	WHI	BLU	ORG	GRN
Weight (kg)	3	4	5	6-7	8-9	10-11	12-14	15-18	19-23	24-29	30-36
PRE											
Atropine	0.06mg	0.08mg	0.1mg	0.13mg	0.17mg	0.2mg	N/A	N/A	N/A	N/A	N/A
INDUCTION											
Etomidate	0.9mg	1.2mg	1.5mg	2mg	2.5mg	3.2mg	4mg	5mg	6.3mg	8mg	10mg
Ketamine	6mg	8mg	10mg	13mg	17mg	20mg	26mg	33mg	42mg	53mg	66mg
Propofol	9mg	12mg	15mg	20mg	25mg	32mg	40mg	50mg	63mg	80mg	100mg
PARALYSIS											
Succinylcholine	6mg	8mg	10mg	13mg	17mg	20mg	26mg	33mg	40mg	53mg	66mg
Rocuronium	3mg	4mg	5mg	7mg	9mg	10mg	13mg	17mg	21mg	27mg	33mg
MAINTENANCE											
Vecuronium	0.3mg	0.4mg	0.5mg	0.7mg	0.9mg	1mg	1.3mg	1.7mg	2.1mg	2.7mg	3.3mg
Lorazepam	0.15mg	0.2mg	0.25mg	0.3mg	0.4mg	0.5mg	0.6mg	0.8mg	1mg	1.3mg	1.6mg

Airway Differences

	Infants	Adults
Head	Large prominent occiput—flexed neck	Flat occiput
Tongue	Relatively larger	Relatively smaller
Epiglottis	Omega sign or "U" shape	Flat, flexible
Vocal Cords	Short, concave	Perpendicular to trachea
Smallest Diameter	Cricoid ring, below cords	Vocal cords
Cartilage	Soft	Firm
Secretions	Increased	Normal
Main Breathing Orifice	Preferential nose breathers	Either, mainly mouth

BREATHING

Ventilator Settings

Zone	3 kg	4 kg	5 kg	PINK	RED	PUR	YEL	WHI	BLU	ORG	GRN
Tidal Vol. (mL)	20-30	24-40	30-50	40-65	50-85	65-105	80-130	100-165	125-210	160-265	200-330
Ventilator Rate (BPM)	20-25	20-25	20-25	20-25	20-25	15-25	15-25	15-25	12-20	12-20	12-20
Insp. Time (sec)	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
PEEP	3-5 cm; Avoid peak pressures >40 or mean >30										
PIP	Start at 16, avg. 20-30 cm, increase by increments of 2 until appropriate minute ventilation										

Normal Pediatric Respiratory Rates

Age	Rate (breaths per minute)
Infant (birth–1yr)	30–60
Toddler (1–3yrs)	24–40
Preschooler (3–6yrs)	22–34
School-age (6–12yrs)	18–30
Adolescent (12–18yrs)	12–16

Mechanical Ventilation Considerations

Support Modes– *spontaneous breathing*

Pressure Support:
Fixed pressure; variable volume w/every sensed breath.

Volume Support:
Fixed TV; pressure variable w/every senses breath-based on proximity to goal vol.

CPAP: (*Continuous Positive Airway Pressure*)
The ventilator always maintains pressure in the circuit; patient takes breath —> ventilator increases flow.

NAVA: (*Neurally Adjusted Ventilatory Assist*)
Support varies depending on sensed diaphragmatic effort.

Non-invasive Ventilation: (Bipap™)
Can have different inspiratory & expiratory pressures, or straight CPAP.

Control Modes– *all breaths controlled*

PRVC: (*Pressure Regulated Volume Control):*
Tidal volume set; delivered w/ a decelerating flow pattern to try to keep peak pressure under a set limit.

Pressure Control:
Set pressure over PEEP for each breath.

Volume Control:
Set TV delivered at constant flow rate—Seldom used.

SIMV: (*Synchronized Intermittent Mandatory ventilation):*
A hybrid between Control and Support. A portion of the breaths (the SIMV breaths) are controlled, the remaining spontaneous breaths are supported. SIMV can be done w/ any type of breath (PRVC, PC or VC).

Chest Tube Sizes

Weight (kg)	Pneumothorax/Transudate	Exudate	Pigtail 5F-12F
<3	8-10	10-12	8.5
3-8	10-12	12-16	8.5
8-15	12-16	16-20	10-12
16-40	16-20	20-28	12-14
>40	20-24	28-36	12-14

Airway DOPE Mnemonic

- **D**islodged tube
- **O**bstructed tube
- **P**neumothorax
- **E**quipment failure

CIRCULATION

Initial Maintenance Fluid Rates

Bodyweight (kg)	Maintenance Rate
0-10	4 mL/kg/hr
11-20	40 mL/ + 2 mL/kg/hr for each kg over 10 kg
21-70	60 mL/ + 1 mL/kg/hr for each kg over 20 kg

Ex: Maintenance rate for a 15 kg child
40 + 10 (5 kg x 2) = 50 mL/hr
(or see weight/length-based dosing system)

Pediatric ECG Values

Age	Heart Rate (bpm)	QRS Axis (degrees)	PR interval (sec)	QRS Duration (sec)	R V1 mm	S V1 mm	R V6 mm	S V6 mm	SV1-RV6 mm
<1 day	94-155 (122)	58-168 (+135)	0.08-0.16 (0.11)	0.03-0.07 (0.05)	5-27 (14)	0.5-23 (9)	0-12 (5)	0.2-10 (4)	2-27 (13)
1-3 days	91-158 (124)	65-171 (+134)	0.08-0.14 (0.11)	0.03-0.07 (0.05)	5-27 (15)	0.5-21 (10)	0.1-12 (5)	0.2-10 (3)	2-28 (14)
3-7 days	90-166 (128)	76-168 (+133)	0.07-0.14 (0.10)	0.03-0.07 (0.05)	3-25 (13)	0.5-17 (7)	0.5-12 (5)	0.4-10 (4)	2-25 (12)
7-30 days	106-182 (148)	65-159 (+110)	0.07-0.14 (0.10)	0.03-0.08 (0.05)	3-22 (11)	0.5-14 (14)	3-17 (8)	0.2-10 (3)	3-22 (12)
1-3 mo	120-179 (149)	31-115 (+75)	0.07-0.13 (0.10)	0.03-0.08 (0.05)	3-19 (10)	0.5-13 (5)	5-22 (12)	0.3-7 (3)	6-29 (17)
3-6 mo	105-185 (142)	7-105 (+60)	0.07-0.15 (0.11)	0.03-0.08 (0.05)	3-20 (10)	0.5-17 (6)	6-23 (14)	0.2-10 (3)	7-35 (19)
6-12 mo	107-168 (132)	7-98 (+54)	0.07-0.15 (0.11)	0.03-0.08 (0.05)	2-20 (9)	0.5-18 (7)	6-23 (13)	0.2-8 (2)	7-33 (19)
1-3 yrs	90-151 (119)	8-100 (+55)	0.08-0.15 (0.11)	0.04-0.08 (0.06)	3-18 (9)	1-21 (9)	6-23 (14)	0.1-7 (2)	7-38 (22)
3-5 yrs	73-137 (108)	7-104 (+55)	0.09-0.16 (0.12)	0.04-0.08 (0.06)	2-18 (8)	2-22 (10)	9-25 (15)	0.1-6 (2)	13-42 (25)
5-8 yrs	65-133 (100)	10-140 (+66)	0.09-0.16 (0.12)	0.04-0.08 (0.06)	1-13 (7)	3-24 (12)	9-27 (17)	0.1-4 (1)	13-47 (28)
8-12 yrs	63-129 (92)	9-115 (+61)	0.09-0.16 (0.13)	0.04-0.09 (0.06)	0.5-10 (6)	3-26 (12)	10-26 (17)	0-4 (1)	15-45 (28)
12-16 yrs	66-120 (86)	11-133 (+58)	0.09-0.18 (0.14)	0.04-0.09 (0.07)	0.5-10 (5)	3-22 (11)	7-23 (15)	0-4 (1)	11-42 (25)

Cardiac Arrest Medications

Dopamine Drip	2-20 mcg/kg/minute
Epinephrine	0.01 **mg/kg** *OR* 0.1 **mL/kg** of 1:10,000 concentration q 3-5 min
Epinephrine Drip	0.1-2 mcg/kg/minute

Pediatric Blood Pressure

Hypotension = <70 + (age in years x 2)

Normal BP Ranges	Systolic (mm Hg)	Diastolic (mm Hg)	Mean Arterial (mm Hg)
Birth (12hr-<1000g)	39-59	16-36	28-42
Birth (12hr, 3kg)	60-76	31-45	48-57
Neonate (96hr)	67-84	35-53	45-60
Infant (1-12m)	72-104	37-56	50-62
Toddler (1-2yr)	86-106	42-63	49-62
Preschooler (3-5yr)	89-112	46-72	58-69
School-aged child (6-7yr)	97-115	57-76	66-72
Pre-adolescent (10-12yr)	102-120	61-80	71-79
Adolescent (13-15yr)	110-131	64-83	73-84

Pediatric Arrhythmia Management

Defibrillation	1st shock 2 J/kg, 2nd shock 4 J/kg, subsequent shocks >/=4 J/kg, max 10 J/kg or adult max dose
SVT	Start at 0.5-1 J/kg, if not effective, increase to 2 J/kg
QTc = QT (sec)/√RR(sec) = 0.xyz(sec) = xyz (milli sec)	

Blood Transfusion Formula (1 unit pRBC's ≈ 250-300 ml's)

Vol to be transfused (mls) = Patient Weight (kg) x Aimed for increment of Hb (g/dl) x 5

Or 10-20 ml/kg for hemorrhagic shock

AVPU

A	**A**wake
V	Responds to **V**erbal Stimulation
P	Responds to **P**ainful stimulation
U	**U**nresponsive

Celsius to Fahrenheit Conversion Chart

CELSIUS (^{0}C)	FAHRENHEIT (^{0}F)	CELSIUS (^{0}C)	FAHRENHEIT (^{0}F)
26	78.8	35	95
27	80.6	36	96.8
28	82.4	37	98.6
29	84.2	38	100.4
30	86	39	102.2
31	87.8	40	104
32	89.6	41	105.8
33	91.4	42	107.6
34	93.2	43	109.4

Conversion Equation:
^{0}C x 1.8 + 32 = ^{0}F OR ^{0}F – 32 /1.8 = ^{0}C

ABUSE: *TEN 4 FACES P*

Any bruising to the:

Torso, **E**ars, or **N**eck — 4 yrs or under

Frenulum, **A**ngle of jaw, **C**heek, **E**yelid, **S**clera

Pattern

Or **ANY** bruising ***4 months or under***

is a significant indicator of child abuse.

DISABILITY/ENVIRONMENT

PEDIATRIC GLASGOW COMA SCALE (PGCS)

	Infant <1yr	Child 1-4 yrs	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, interacts	Oriented and Alert
4	Irritable cry, consolable	Confused speech, disoriented, consolable	Disoriented
3	Cries persistently to pain	Inappropriate words, inconsolable	Nonsensical speech
2	Moans to pain	Incomprehensible, agitated	Moans, unintelligible
1	No response	No response	No response
	Motor		
6	Spontaneous movement	Spontaneous movement	Follows commands
5	Withdraws to touch	Localizes pain	Localizes pain
4	Withdrawals to pain	Withdrawals to pain	Withdrawals to pain
3	Decorticate flexion	Decorticate flexion	Decorticate flexion
2	Decerebrate extension	Decerebrate extension	Decerebrate extension
1	No response	No response	No response

Burn Resuscitation Fluid Rates/Target Urine Output By Type & Age

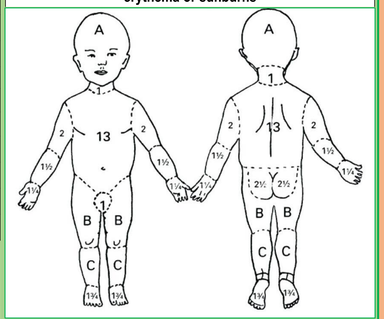
Category of Burn	Age/weight	Adjusted Fluid Rates	Urine Output
Flame or Scald	Adults/Child (≥14yo)	2ml LR x kg x % TBSA	0.5ml/kg/hr 30-50ml/hr
	Child <14yo	3ml LR x kg x % TBSA	1ml/kg/hr
	Infants and young child (≤30kg)	2ml LR x kg x % TBSA + sugar containing solution at maintenance rate	1ml/kg/hr
Electrical	ALL AGES	4ml LR x kg x % TBSA until urine clears	1-1.5ml/kg/hr until urine clears

Lund and Browder Burn Chart

	Half of head (A)	Half of one thigh (B)	Half of one lower leg (C)
0 yr	9 1/2	2 3/4	2 1/2
1 yr	8 1/2	3 1/4	2 1/2
5 yr	6 //2	4	2 3/4
10 yr	5 1/2	4 1/4	3
15 yr	4 1/2	4 1/4	3 1/4

Relative percentage of body surface area (%BSA) affected by growth

Do not include Superficial (first-degree) burns such as erythema or sunburns



Seizure & ICP Medications

- **3% Saline:** 2-5 ml/kg IV over 20 min (max 250 ml)
- **Mannitol:** 1 g/kg IV (infuse with filter)
- **Levetiracetam:** 50-60 mg/kg IV (max 4500 mg)
- **Lorezepam:** IV 0.1 mg/kg (max 4mg)
- **Fosphenytoin:** 20 mg PE/kg IV (max 1500mg PE)

To learn more about this resource email pedready@jax.ufl.edu or visit http://www.emlrc.org/flpedready/

Pediatric Emergency ABC's and More

http://www.emlrc.org/flpedready/

Last updated
05/01/2019

PAIN MANAGEMENT & SEDATION

Acute Pain Medications

Generic (Brand)	Pediatric (<12 yo)
Acetaminophen (Tylenol®)	15 mg/kg PO q 4-6 h Max: 90 mg/kg/day
Acetaminophen IV (Ofirmev®) Use only if not tolerating PO	<50 kg 15 mg/kg IV q 6 h or 12.5 mg/kg IV q 4 h prn pain Max: 75mg/kg/day
Ibuprofen (Motrin®) (> 6 months)	10 mg/kg PO q 6 to 8 h Max: 40 mg/kg/day or 2400 mg/day
Ketorolac (Toradol®) (> 6 months)	0.5-1 mg/kg/ dose IM/IV q 6 h Max: 15-30 mg q 6 h x 5 day
Naproxen (Naprosyn®) (> 2 years)	5 mg/kg PO q 12 h Max: 1000 mg/day
Morphine	IV 0.1 mg/kg q 2-4 h
Hydromorphone (Dilaudid®)	IV 0.015 mg/kg q 4 h
Fentanyl	IV 1-2 mcg/kg q 1-2 h (max 50 mcg/dose)
Hydrocodone/APAP 325 mg (Norco 5, 7.5, 10 tabs) Hycet (7.5 mg/325 mg per 15 mL)	0.1-0.2 mg/kg q 4-6 h

Intranasal Medications

Generic	Dose	Max Dose	Comments
Fentanyl	**IN:** 1.5-2 mcg/kg q 1-2 h **Neb:** 1.7-3 mcg/kg	3 mcg/kg or 100 mcg	Use most concentrated form with an atomizer. 1 mL/nare max. Divide dose equally between each nare.
Midazolam (5 mg/mL)	**IN:** 0.3 mg/kg	10 mg or 1 mL per nostril (total 2 mL)	

Ketamine (Ketalar®)

Indications	Starting Dose
Procedural Sedation	**IV:** 1-2mg/kg; **IM:** 4-5 mg/kg
Sub-dissociative Analgesia	**IV:** 0.1 to 0.3 mg/kg; **IM:** 0.5-1.0 mg/kg; ***IN:** 0.5-1.0 mg/kg
Excited Delirium Syndrome	**IV:** 1 mg/kg; **IM:** 4-5 mg/kg

Nonpharmacologic Interventions*

Physical (Sensory) Interventions	Cognitive-Behavioral Interventions
Comfort positioning	Psychological preparation, education, or coaching
Cutaneous stimulation	Distraction tools: movies, games, videos, apps, toys with light/sound, bubbles
Nonnutritive sucking	Relaxation techniques (breathing, meditation, etc.)
Pacifier +/- sucrose solution	Music and singing
Pressure, massage	Guided imagery
Hot or Cold treatments	Conversation and therapeutic language

***Used alone or in conjunction with pharmacologic interventions. Intervention based on age, developmental stage, setting and situation.**

For more information on nonpharmacologic interventions or to download a distraction toolkit, visit
http://pami.emergency.med.jax.ufl.edu/resources/new-approaches-to-pain-course/

DISTRACTION TOOLBOX

PAMI Pain Assessment and Management Initiative

http://pami.emergency.med.jax.ufl.edu

Procedural Sedation and Analgesia

Generic (Brand)	Pediatric	Comments
Ketamine (Ketalar®)	>3 mo: IV 1-2 mg/kg; additional doses 0.5 mg/kg IV q 10-15 min prn; IM 4 - 5 mg/kg	Risk of laryngospasm increases with active asthma, upper respiratory infection and procedures involving posterior pharynx; vomiting occurs, commonly consider premedication. Not recommended in patients < 3 mo.
Midazolam (Versed®)	IV 0.05-0.1 mg/kg IN 0.2-0.3 mg/kg (IN max 10 mg)	Initial max dose 2 mg.
Propofol (Diprivan®)	IV 1 mg/kg slow push (1-2 min); additional doses 0.5 mg/kg	Risk of apnea, hypoventilation, respiratory depression, rapid changes in sedative depth, hypotension; provides no analgesia
Etomidate (Amidate®)	Risk of myoclonus (premedication w/ benzo or opioid can decrease), pain with injection nausea and vomiting, risk of adrenal suppression; provides no analgesia	
Ketamine + Propofol	IV ketamine 0.75 mg/kg + propofol 0.75 mg/kg. Additional doses: ketamine 0.5 mg/kg, propofol 0.5-1 mg/kg	See ketamine and propofol comments respectively
Dexmedetomidine (Precedex®)	IV 0.5–2 mcg/kg loading dose (over 10 min) followed by 0.5 to 2 mcg/kg/h continuous infusion IN 2-3 mcg/kg	Risk of bradycardia, hypotension, especially with loading dose or rapid infusions, apnea, bronchospasm, respiratory depression
Nitrous oxide	50% N2O/50% O2 inhaled	Do not use if acute asthma exacerbation suspected pneumothorax/other trapped air or head injury with altered level of consciousness
Morphine	IV 0.1-0.2 mg/kg, titrated to effect	Monitor mental status, hemodynamics, and histamine release. Requires longer recovery time than fentanyl. Difficult to titrate during procedural sedation due to slower onset and longer duration of action. Reduce dosing when combined with benzodiazepines (combination increases risk of respiratory compromise)
Fentanyl	1-3 yo: 2 mcg/kg; 3-12 yo 1-2 mcg/kg	100 times more potent than morphine; Rapid bolus infusion may lead to chest wall rigidity. Reduce dosing when combined with benzodiazepines and in elderly. Preferred agent due to rapid onset and short duration.

COMMON PEDIATRIC PAIN SCALES

FLACC SCALE

		0	1	2
1	FACE	No particular expression or smile	Occasional grimace or frown, withdrawn or disinterested	Frequent to constant frown, clenched jaw, quivering chin
2	LEGS	Normal position; relaxed	Uneasy, restless, tense	Kicking or legs drawn up
3	ACTIVITY	Lying quietly, normal position, easily moves	Squirming, shifting back and forth, tense	Arched, rigid or jerking
4	CRY	None (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, scream or sobs, frequent complaints
5	CONSOLABILITY	Content, relaxed	Reassured by occasional touching, hugging or being spoken to, distractible	Difficult to console or comfort

MISCELLANEOUS INFORMATION

Weight (kg —> lbs)

(kg)	(lbs)	(kg)	(lbs)
0	0.0	37.5	82.7
2.5	5.5	40	88.2
5	11.0	42.5	93.7
7.5	16.5	45	99.2
10	22.0	47.5	104.7
12.5	27.6	50	110.2
15	33.1	52.5	115.7
17.5	38.6	55	121.3
20	44.1	57.5	126.8
22.5	49.6	60	132.3
25	55.1	62.5	137.8
27.5	60.6	70	154.3
30	66.1	72.5	159.8
32.5	71.7	75	165.3
35	77.2	77.5	170.9

1 kg = 2.20 lbs

Arterial Line Catheter Size by Age/Weight

Age	Weight (kg)	Gauge/French/Length
Infant	<10 kg	24 G or 2.5 F; 2.5 cm
Child	10 - 40 kg	22 G or 2.5 F; 2.5 cm
Adolescent	>40 kg	20 G

Central Venous Line Catheter Size by Age/Weight

Age (years)	Weight (kg)	Catheter Gauge	French Gauge	Length (cm)
< 1, newborn	4-8	24	3.0	5-12
<1	5-10	22	3.0-3.5	5-12
1-3	10-15	20	4.0	5-15
3-8	15-30	18-20	4.0-5.0	5-25
>8	30-70	16-20	5.0-8.0	5-30

Pediatric Trauma Score

Clinical Parameter	Parameter Category	Score	Clinical Parameter	Parameter Category	Score
Weight (kg)	≥ 20	2	CNS	Awake	2
	10-20	1		Obtunded/LOC	1
	<10	-1		Coma/decerebrate	-1
Airway	Normal	2	Open Wound	None	2
	Maintainable	1		Minor	1
	Unmaintable	-1		Major/penetrating	-1
SBP (mmHg)	≥90	2	Skeletal	None	2
	50-90	1		Closed fracture	1
	<50	-1		Open/multiple	-1

Death Communication Tips: GRIEV_ING*

G- gather the family/community; insure that all members are present or identify representatives,
· Gather your inner strength (who if not you?) and Gather your team- 2 minimum, Doctor, if possible.

R- resources; call for support resources available to assist the family/community with their grief or the disaster at hand, i.e. community, hospital, chaplain services, ministers, family, and friends. Create list of resources.

I- identify yourself, identify the deceased or injured patient by name, identify the situation, and identify the state of knowledge of the family relative to the events of the day. Identify that you are bringing bad news.

E- educate; briefly educate the family as to the events that have occurred, educate them about the current state of their loved one(s), educate others about how they can help and not create more chaos.

V- verify that their family member has died or other events/bad news. Be clear! Use the words dead or died, missing, etc. No jargon. Be honest.

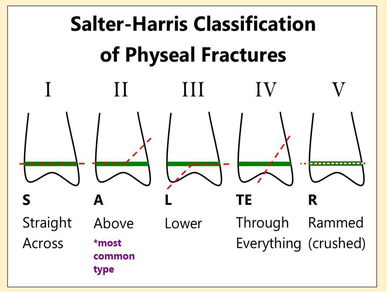
__ Space-give the family/community personal space and time for an emotional moment; allow the family time to absorb the information.
Stop talking. Family may scream, hit, etc. Protect yourself.

I- inquire; ask if there are any questions and answer them to the best of your ability. You don't have to be perfect. You may not have all the answers.

N- nuts and bolts; preparation; inquire about organ donation, funeral services, and personal belongings. Offer family opportunity to view the body/the site.

G- give them your card, hospital or community information. Offer to answer questions that may arise later. Return their call or establish a call center/resource.

*adapted from Hobgood, C. *The educational intervention "GRIEV_ING" improves the death notification skills of residents.* Acad Emerg Med. 2005 Apr;12(4):296-301.



Normal WBC Values

	White Blood Cells
Age	(x 10^3/µL)
Birth	9-30
1-3 days	9-38
4-7 days	5-21
7-14 days	5-20
15-60 days	5-20
2-5 months	5.5-18
6 months-1yr	6.0-17.5
1-3 years	6.0-17.0
3-5 years	5.5-15.5
6-10 years	4.5-14.5
10-15 years	4.5-13.5
15-20 years	4.5-12.5

Hemoglobin/Hematocrit Normal Pediatric Values

Age	Hemoglobin (g/dL)	Hematocrit (%)
Term newborn	18.0-21.5	51-68
1-3 days	14.0-24.0	43-68
4-7 days	14.3-22.3	42-62
7-14 days	12.9-20.5	39-59
14-60 days	10.7-17.3	33-51
2-5 months	10.1-14.5	30-40
6 months-1yr	10.0-13.2	30-39
1-2 years	10.0-13.5	30-40
2-4 years	10.5-14.5	32-42
5-7 years	10.9-14.9	33-44
8-10 years	10.9-14.9	33-44
10-15 years	11.4-15.4	34-45

Key Pediatric Lab Values

Lab test	Age	Conventional Units	SI units
ALT	<12 mo	13–45 U/L	13–45 U/L
	1–3 yr	5–45 U/L	5–45 U/L
	4–6 yr	10–25 U/L	10–25 U/L
	7–11 yr	10–35 U/L	10–35 U/L
	12–13 yr	10–30 U/L (female) 10–55 U/L (male)	10–30 U/L 10–55 U/L
	>14 yr	5–30 U/L (female) 10–45 U/L (male)	5–30 U/L 10–45 U/L
ALKALINE PHOSPHATASE	Infant	150–420 U/L	150–420 U/L
	2–10 yr	100–320 U/L	100–320 U/L
	Adolescent	100–390 U/L	100–390 U/L
	Adult	30–120 U/L	30–120 U/L
AMMONIA	Newborn	90–150 mcg/dL	64–107 µmol/L
	0–2 wk	79–129 mcg/dL	56–92 µmol/L
	Infant/child	29–70 mcg/dL	21–50 µmol/L
	Adult	15–45 mcg/dL	11–32 µmol/L
AMYLASE	0–14 days	3–10 U/L	3–10 U/L
	15 days–13 wk	2–22 U/L	2–22 U/L
	13 wk–1 yr	3–50 U/L	3–50 U/L
	>1 yr	25–101 U/L	25–101 U/L
AST	0–10 days	47–150 U/L	47–150 U/L
	10 days–24 mo	9–80 U/L	9–80 U/L
	>24 mo	15–40 U/L	15–40 U/L
BICARBONATE	Newborn	17–24 mEq/L	17–24 mmol/L
	Infant	19–24 mEq/L	19–24 mmol/L
	2 mo–2 yr	16–24 mEq/L	16–24 mmol/L
	>2 yr	22–26 mEq/L	22–26 mmol/L
GLUCOSE	Preterm	20–60 mg/dL	1.1–3.3 mmol/L
	Newborn, <1 day	40–60 mg/dL	2.2–3.3 mmol/L
	Newborn, >1 day	50–90 mg/dL	2.8–5.0 mmol/L
	Child	60–100 mg/dL	3.3–5.5 mmol/L
	>16 yr	70–105 mg/dL	3.9–5.8 mmol/L
CSF	*Age*	*WBC Count/µL (median)*	*95th Percentile*
	0–28 days	0–12 (3)	19
	29–56 days	0–6 (2)	9
	Child	0–7	

To learn more about this resource email pedready@jax.ufl.edu or visit http://www.emlrc.org/flpedready/