Hospital Patient Transfers

Purpose: To establish a procedure for inter-facility transfers. This protocol is based on the Michigan model protocol: *Inter-facility Patient Transfers and Critical Care Patient Transports*. This protocol is adopted in its place to meet the unique needs of the Delta County MCA and the patients cared for within the DCMCA system.

1. Responsibility:
    A. Patient transfer is a physician-to-physician referral. The transferring physician is responsible for securing the acceptance of the patient by an appropriate physician at the receiving facility prior to the transfer. The name of the accepting physician must be included with the transfer orders.
    B. It is the responsibility of the transferring facility to:
        a. Perform a screening examination.
        b. Determine if transfer to another facility is in the patient's best interest.
        c. Initiate appropriate stabilization measures prior to transfer.
    C. During transport, the transferring physician is responsible for patient care until the arrival of the patient at the receiving facility.
    D. If unanticipated events occur during patient transport, and contact with the transferring physician is not possible, then on-line Medical Control will serve as backup medical direction.
    E. If the transferring physician anticipates that he/she will be unavailable at any point during the time period the transfer is to take place, he/she should notify the on-line Medical Control Physician.
    F. It is the transferring physician's responsibility to understand the training and capabilities of the transporting EMS personnel.
    G. It is the transferring physician's responsibility to be familiar with the Delta County Inter-facility Transfer Protocols.

2. Transport.
    A. Pre-transport:
        a. Care initiated by the transferring facility may need to be continued during transport. The transferring physician will determine the method and level of transport and any additional treatment(s), if any, that will be provided during the course of transport.

b. Orders for treatment, including medications for transfers, or other orders shall be provided in writing to the EMS personnel prior to initiation of the transport by the transferring Physician. (**See Protocol 11-01(s)**)
c. Ordered medications not contained within the EMS System Medication Box/Bag must be supplied by the transferring hospital.
d. EMS personnel must be trained in all equipment and medications being used in the patient's care or appropriately trained staff must accompany the patient.
e. Should the patient require care and/or equipment above and beyond the normal scope of practice and training of the EMS personnel, the transferring facility shall provide appropriate staff or consider other appropriate means of medical transportation.
f. In emergency circumstances, Just-in-time training may be provided to EMS personnel to ensure continuation of care.
g. The paramedic has the right to decline transport if he/she is convinced patient care is outside their scope of practice and training or, alternatively, to insist a hospital staff member accompany them on the transfer or consider other appropriate means of medical transportation.
h. If additional staff accompanies the patient, the transferring physician is responsible for ensuring their qualifications. This staff will render care to the patient under the orders of the transferring physician. It will be the responsibility of the transferring facility to provide arrangements for the return of staff, equipment, and medications.
i. The following information should accompany the patient (but not delay the transfer in urgent situations):
    j. Copies of pertinent hospital records
    ii. Other pertinent information including appropriate transfer documents.

B. During transport:
    a. Hospital supplied medications not used during transport must be appropriately tracked, wasted, and documented. All controlled substances must have a documented chain of custody.
    b. The medication, concentration, and administration rates of all medications being administered will be documented on the patient care record.
    c. Vital signs will be documented before and after all medication doses and/or rate changes.
    d. Patient response to ordered medications will be documented.
    e. Interventions performed enroute, and who performed them, will be documented on the patient care record.
    f. In the event that a patient's condition warrants intervention beyond the written physician orders provided by the transferring physician, the EMS personnel will contact the transferring physician. If that is not possible, the EMS personnel will follow Delta County Medical Control Protocols and initiate contact with the on-line Medical Control Physician from either the sending or receiving facility or, if not able to contact those facilities, the closest appropriate on-line Medical Control facility.

Written Transfer Orders

Purpose: To provide guidance for written inter-facility transfer orders. Appropriate transfer orders are an essential component of the transfer process. The transferring physician is responsible for the care of the patient until care is assumed by the accepting physician at the receiving facility.

Guidance:

I. Use standard transfer order document.
II. Orders should provide for the basic needs of the patient during the transfer. This should include, but not be limited to:
    a. Oxygen delivery method and FiO_2.
    b. Vascular access.
    c. IV fluid solution and rate.
    d. ECG monitor, SpO_2, $ETCO_2$, and vital signs.
    e. Other anticipated patient needs.
III. Indicated specific interventions.
    a. Catheter and tube monitoring and maintenance (*i.e.,* Foley, NG, chest drainage unit).
    b. *Ventilator Orders* document is required for ventilated patients.
    c. Medications.
        i. May reference appropriate medication protocols.
        ii. If no medication protocol is referenced, the following must be addressed:
            a) Medication route and delivery method (*i.e.,* IM, IVP or infusion).
            b) Medication dose or infusion rate.
            c) Titration parameters (rate change and timing).
            d) Maximum dose rate.
            e) Discontinue and/or hold orders.
IV. Parameters outlining when to contact physician (**see Protocol 11.01**).
V. Documentation (**see Protocol 11.01**)
    a. The medication, concentration, and administration rates of all medications being administered will be documented on the patient care record.
    b. Vital signs will be documented before and after all medication doses and/or rate changes.
    c. Patient response to ordered medications will be documented.

Delta County Medical Control Authority
Interfacility Transfers

Initial Date: January 2021 (rev July 2023) **Section 11-02**

Categories of Inter-facility Transfers

Purpose: To provide guidelines for the classification of inter-facility transfers. This protocol classifies patient transfers according to patient acuity, anticipated complexity of management requirements and the scope of practice of the EMS provider. *The Attending Physician is responsible for determining the level of care required.* The Physician should be cognizant of the Michigan Scope of Practice for EMS personnel and may consult with the providers as necessary.

A. Categories of Inter-facility Transfers - Personnel.
    1. Category 1 – Critical Care Paramedic in attendance.
    2. Category 2 – EPIC Trained Paramedic in attendance.
    3. Category 3 – ALS Paramedic in attendance.
    4. Category 4 – EMT in attendance.

B. Category 1 transfers include (but are not necessarily limited to):
    1. When required care is not included in the scope of practice of a standard BLS, ALS or EPIC trained provider, a Critical Care Paramedic should be in attendance, or appropriate clinical staff should accompany the EMS providers. Exceeding the scope of practice includes equipment or medications not included in standard patient care protocols or EPIC protocols.
    2. Ventilators.
        i. The patient requires frequent settings changes to maintain effective oxygenation or ventilation (*except* as permitted in protocol).
    3. Pressors.
        i. The provider is expected to titrate a pressor to effect (*except* as permitted in protocol).
    4. High Risk OB:
        i. If the mother may deliver enroute, additional staff should be considered.
        ii. If the mother is not expected to deliver but there is a high risk of maternal complications.

5. Stability:
    i. If the patient's condition requires:
        1. Medications or equipment not included in the EPIC list,
        2. OR multiple (*i.e.,* three or more) medications from the EPIC list are being administered,
        3. OR the patient is on three or more pieces of equipment (*i.e.,* one pump plus vent plus chest tube).
    ii. If a patient is critically unstable, such that more than one provider is needed to effectively treat the patient during transport – additional staff should be sent.

C. Category 2 Transfers:
1. EPIC providers are appropriate for relatively stable patients but who require equipment and/or medications outside the normal scope of practice of the ALS Paramedic.
2. Ventilators.
    i. If the provider is maintaining preset ventilator settings or is making predefined changes directed by the physician or permitted by protocol.
3. Pressors.
    i. if the provider is maintaining a pressor medication at a preset rate or making predefined changes directed by the physician or permitted by protocol.
4. High-Risk OB:
    i. If the patient is relatively stable and delivery is not expected enroute.
    ii. If delivery is expected and the patient is stable, the EPIC medic may transport if additional clinical personnel are sent.
5. Stability:
    i. The patient is relatively stable, in that, two or fewer of the EPIC approved medications and two or fewer pieces of equipment are necessary. If more than two EPIC medications or special equipment are required, then additional appropriate clinical personnel should be considered.

6. In emergency circumstances, appropriate Just-in-time training may be considered.

D. Category 3 Transfers.
   1. Standard ALS level personnel may transport interfacility transfers in which the care falls within the scope of practice of an ALS Paramedic.
   2. Ventilators.
      i. Only automatic transport ventilators are permitted. Other ventilators are not permitted unless accompanied by appropriate clinical staff.
   3. Medications on Critical Care or EPIC lists.
      i. Not permitted unless accompanied by appropriate clinical staff.
   4. High-Risk OB.
      i. Not permitted unless accompanied by appropriate clinical staff.
   5. Stability.
      i. Unstable patients may be transported with additional appropriate clinical staff.
      ii. Relatively stable and imminently stable patients receiving only medications included in standard EMS treatment protocols.

E. Category 4 Transfers.
   1. Standard BLS level personnel may transport interfacility transfers in which the care falls within the scope of a BLS EMT.
   2. Clinically stable patients requiring no care beyond litter transport and/or supplemental oxygen.

F. See supplement 11-2(s) for Scope of Practice and medication/equipment lists.

Patient Care Protocols and Paramedic Scope of Practice

ALS protocols

Amiodarone
Blood product management
Chest tube management
Diltiazem
Epinephrine
Fentanyl
Heparin
Hydromorphone
Ketamine
Lidocaine
Magnesium Sulfate
Midazolam
Morphine Sulfate
Patient sedation (interfacility)
Thrombolytics

EPIC protocols

Dobutamine
Dopamine
Esmolol
Fosphenytoin
Insulin
Labetolol
Mannitol
Nicardipine
Nitroprusside
Norepinephrine
Octreotide
Oxytocin
Paralytics
Potassium Chloride
Propofol
Valproic Acid
Vasopressin
Ventilator management

Some medications on this list are part of a primary 911 response protocol. They are included here because when administered during an interfacility transfer they are administered in a different manner and/or dosage than in normal ALS response.

BETP Bureau of EMS, Trauma & Preparedness

Scope of Practice Document Paramedic

Airway skills

Airway
- Nasopharyngeal
- Oropharyngeal
- Supraglottic
- Endotracheal intubation
- Cricothyrotomy

Airway obstruction dislodgement
- Manual
- Direct laryngoscopy

Oxygen therapy
- Humidified
- Nasal cannula
- Non-rebreather
- Partial rebreather
- Simple face mask
- Venturi mask
- High flow nasal cannula

CPAP

Chest decompression
- Needle

Chest tube placement
- Assist only

Chest tube
- Monitoring
- Management

End tidal CO_2
- Monitor

Interpretation

Pulse oximetry

Suctioning
- Upper airway
- Tracheobronchial of intubated patient

Cardiac skills

CPR/AED
- Mechanical device

Cardiac
- Monitoring
- Interpretation-12 lead ECG
- Cardioversion-electrical
- Defibrillation-manual
- Transvenous cardiac pacing-monitoring & maintenance

Hemorrhage control
- Direct pressure
- Tourniquet
- Wound packing

Musculoskeletal skills

Cervical spine
- Motion restriction
- Cervical collar placement

Spinal Motion Restriction

Splint
- Long bone stabilization
- Joint stabilization
- Traction splint

Patient Movement

Emergency moves

Intravenous/Intraosseous
- Intravenous Administration
- Intraosseous Administration
- Venous Blood Sampling
- Blood chemistry analysis
- Central line-monitoring
- Indwelling catheters and implanted central IV port access
- IV maintenance of medicated fluids

X-Local Medical Control Approval

Scope of Practice Paramedic 05/2020

BETP
Bureau of EMS, Trauma & Preparedness

Scope of Practice Document
Paramedic

Medication Routes

- Aerosolized/nebulized
- Endotracheal tube
- Inhaled
- Intradermal
- Intramuscular-injection & auto-injector
- Intranasal
- Intraosseous
- Intravenous
- Mucosal/sublingual
- Nasogastric
- Oral
- Rectal
- Subcutaneous
- Topical
- Transdermal

Childbirth

Assist Childbirth

Vital Signs

Blood pressure

- Automated
- Manual

Blood Glucose

Blood glucose monitoring

Eye Irrigation

Eye irrigation

- Hands-free using sterile eye irrigations device

Patient Restraint

Mechanical patient restraint

Patient Transport

Patient transport

Medications

- Aspirin for ischemic chest pain
- Anti-arrhythmic medications
- Antidotes
- Antiemetic medications
- Anti-hemorrhagic medications
- Benzodiazepine medications
- Beta-agonist medications
- Blood/blood products-maintenance
- Dextrose
- Epinephrine
- Glucose
- Immunizations
- Nitrous oxide and other inhaled medications
- Nitroglycerin
- Opioid antagonists
- Over the counter analgesics
- Parenteral analgesia
- Steroids
- Thrombolytics
- Other medications dictated by protocol-X

X-Local Medical Control Approval

Scope of Practice Paramedic 05/2020

Vehicle, Staffing and Training Requirements for Enhanced Care Transports

Purpose: To provide hospital facilities, physicians, and medical transport personnel with guidelines to facilitate inter-facility transportation of seriously ill and injured patients within Advanced Life Support vehicles.

1. Vehicle and Staffing
    A. MDHHS Vehicle License. All vehicles conducting Enhanced Care Inter-Facility Patient Transports must be licensed as transporting Advanced Life Support (ALS) vehicles.
    B. Equipment. The following is the minimum equipment that will be carried by an ALS vehicle while it is providing Enhanced Care Inter-Facility Patient Transport, in addition to the equipment required by Part 209, P.A. 368 of 1978, as amended, and local medical control authority protocols:
        i. Waveform Capnography
        ii. Portable Ventilator or staff capable of providing ventilatory support.
        iii. Portable Infusion Pump(s)
        iv. Pressure infusion bag(s)
        v. This additional equipment is typically supplied by the sending facility.
    C. Staffing
        i. All ALS vehicles that conduct Enhanced Care Inter-Facility Patient Transports will be staffed in accordance with local medical control requirements with at least one (1) paramedic trained in the Enhanced Care Inter-Facility Patient Transport curriculum. The trained paramedic must be in the patient compartment while transporting the patient.
        ii. The above requirement for staffing does not apply to the transportation of a patient by an ambulance if the patient is accompanied in the patient compartment of the ambulance by an appropriately licensed health professional designated by a physician and after a physician-patient relationship has been established as prescribed. (PA 368, Section 20921(5)).

2. Enhanced Care Inter-Facility Patient Transport Physician Director/Quality Improvement.
    A. The Enhanced Care Inter-Facility Patient Transport Physician Director will be responsible for:
        i. Oversight of a quality improvement program for Enhanced Care Inter-Facility Patient Transports
        ii. Oversight of the training curriculum for EMS personnel trained under this protocol.
3. Enhanced Paramedic Inter-Facility Care (EPIC) curriculum.
    A. Paramedics will enroll in the WMRMCC EPIC training program at www.wmrmcc.org and complete the online portion of the program.
    B. The online portion consists of a series of educational videos and an online test for each subject. The subjects include:
        i. General Pharmacology
        ii. Medications on the Pump
        iii. IV Pumps
        iv. Blood Products and Administration
        v. Chest Tube Management
        vi. LTV Ventilator Operation
        vii. Lab Value interpretation
        viii. Call Overview / Patient Care record
    C. Upon successful completion of the online portion of the program, the Paramedic will then participate in a series of hands-on educational sessions to ensure knowledge and proficiency in skills essential for the safe inter-facility transport of patients.
    D. The skills portion will be conducted by DCMCA and BETP approved subject matter experts and consist of the following topics:
        i. Infusion pump operation
        ii. Chest tube maintenance
        iii. LTV 1200 Ventilator operation

E. Upon successful completion of both the online and skills components of the EPIC program, the Paramedic will be considered certified for enhanced care inter-facility transport of patients by the Delta County MCA.
F. EPIC Paramedics will demonstrate annual competency in the operation of the LTV ventilator, chest tube maintenance, the operation of infusion pumps, and administration of EPIC medications.

Initial Date: Oct 2020 (rev Feb 2021) **Section 11-04**

Blood Administration

Blood administration initiated at the sending facility may be continued by the paramedic. If additional units are indicated, they may be transfused as ordered by the sending physician.

Indications:
Type and crossmatch for donor units typically ordered for the following conditions:

1. Obvious significant blood loss.
2. Active or recent GI bleeding.
3. Thoracic Aortic Aneurysm or Abdominal Aortic Aneurysm.
4. Hgb < 8 mg/dl or Hct < 25% or symptomatic anemia.
5. Decreasing Hgb or Hct in continuing or suspected bleeding.

Blood products include:

1. Whole blood
2. PRBC (packed red blood cells)
3. FFP (fresh frozen plasma)
4. Platelets
5. Cryoprecipitate

Equipment:

1. Physician orders.
2. Blood product - typed and cross matched or emergency release O neg PRBC.
3. Dedicated vascular access line (18 gauge or larger catheter).
4. Second vascular access site (may be 20 gauge or larger catheter).
5. Filtered blood administration set.
6. Normal saline solution (0.9% saline).
7. Blood warmer – if available.
8. Thermometer.

Procedure for Continued Administration of Blood Product:

1. **Blood product will be initiated by the transferring facility.**
2. Prior to leaving the transferring facility, physically check the product with the transferring nurse and confirm you have the right product for the right patient. Both crew members will verify the blood product ID numbers with the patient ID numbers before leaving the facility. Review the order with the transferring nurse.
3. Re-confirm the order prior to departure.

4. Maintain temperature of blood products in the provided transport container. OSF Blood Bank will provide the container. Blood products are NOT to be removed from this container for transport. The container is ONLY to be open when a product is needed. After product is removed, the container is to be properly re-packed with the remaining products. The container lid must be securely replaced for temperature stability.
5. Ensure suitable vascular access (usually18 gauge or larger). A second vascular access site should be available (20 gauge or larger).
6. Assess baseline vital signs and temperature prior to start of transfusion. Document temperature and VS at 5 minutes, 15 minutes and at end of transfusion.
7. Document blood product unit number. Document time of start, time ended, and total volume delivered.
8. Assess the patient for the possibility of a transfusion reaction and consider prophylactic administration of ibuprofen or acetaminophen and diphenhydramine; if ordered.
9. Monitor every 5 minutes for signs of an adverse reaction (see below for indications for adverse reaction).
    a. Continuously monitor ECG, SpO_2 and $ETCO_2$ (if available).
    b. If there are indications of adverse reaction, see below.
10. Ideally, blood products should be administered via a blood warmer whenever available.
11. Do not mix blood with Dextrose 5% and Water (causes hemolysis).
12. Do not mix with Lactated Ringer's solution (causes clotting).
13. Do not mix with medications (may react).
14. Maintain the temperature of any additional blood product accompanying the patient.
15. If starting additional transfusion enroute follow steps 4-11 above after doing the following:
    a. Check the patient for the following: right patient, right blood product, right type, and the expiration date. *Have a second provider confirm. This must be done at the sending facility prior to departure*.
    b. Use large bore tubing (blood Y tube). Connect the 0.9% saline and prime the tubing with the 0.9% saline.
    c. Connect the blood bag to the filtered port of the tubing.
    d. Cover the administration filter with blood.
    e. Typically, initiate the transfusion slowly and observe for signs of an adverse reaction.
    f. If no sign of adverse reaction, advance to the ordered rate.
        i. Typically, wide-open for management of shock or continuing hemorrhage, otherwise as per medical direction (written orders).

ii. Pressure bag may be indicated as ordered.
iii. Blood volume in hemorrhagic shock is ideally replaced at a ratio of1 unit PRBCs to 1 unit of FFP (to 1 unit of platelets if available).

16. After administration of a blood product is complete, return completed forms (Crossmatch Transfusion Tags with dual verification signatures) to the sending facility laboratory along with the empty blood bags and container.
17. For blood products from OSF-SFH; any unused blood products must be returned immediately to the OSF blood bank upon return to OSF–St Francis Hospital.

Adverse Transfusion Related Reactions:

1. Signs of anaphylaxis
2. Hemolytic reaction
3. DIC
4. Infection
5. Signs of adverse reactions include:
    a. Temperature of 2°F (1°C) or more above the baseline temperature
    b. Hives, itching, or facial edema (anaphylaxis)
    c. Swelling, soreness, or hematoma at the venous access site
    d. Back or flank pain
    e. Tachycardia
    f. Hypotension
    g. Respiratory distress (wheezing and dyspnea)
    h. Bleeding from widely varied sites or previously clotted wounds
    i. Blood in urine
    j. Nausea and vomiting
    k. Circulatory collapse

Suspected Adverse Transfusion Reaction:

1. Stop the transfusion. Disconnect the blood administration set from the adapter or hub of vascular access device.
2. Keep the vein open with 0.9% saline using new tubing.
    a. Administer crystalloid to maintain SBP >90 mmHg.
3. Notify the sending facility, Medical Control and/or the receiving facility.
4. Monitor vital signs. Monitor I&O.
5. Administer supplemental O2 to maintain SaO_2 > 94%.
6. Follow Allergic Reaction Protocol if allergic reaction suspected.
7. Hold the remaining blood product and blood tubing for lab analysis.
8. Receiving hospital will order necessary tests for suspected transfusion reaction and will collect specimens necessary upon arrival.
9. Further orders per Medical Control.

Hypocalcemia:

1. Due to calcium binding to citrate preservative.
2. Signs & Symptoms: arrhythmias, hypotension, muscle cramping, nausea, vomiting, seizure activity, and/or tingling sensation in the fingers. Prolonged QT interval.
3. Treatment:
    a. Contact Medical Control.
    b. Obtain 12 lead ECG.
    c. Slow or stop the transfusion if ordered.
    d. If ordered by Medical Control; CaCl 1 gm slow IVP.

Hyperkalemia:

1. From lysed RBC's
2. Signs &Symptoms: diarrhea, intestinal colic, flaccidity, muscle twitching, oliguria, bradycardia, tall, peaked T waves, prolonged PR interval, prolonged QRS and/or cardiac arrest.
3. Treatment:
    a. Contact Medical Control.
    b. Perform 12 lead EKG.
    c. Slow or stop the transfusion if ordered.
    d. If ordered:
        i. CaCl 1 gm slow IVP.
        ii. $NaHCO_3$ 50 – 100 mEq slow IVP or IVPB.
        iii. Albuterol 2.5 mg nebulized.

Initial Date: February 2021(rev Aug 2021) **Section 11-05**

Chest Tubes

Paramedics may monitor and troubleshoot an established chest tube. The insertion of chest tubes is not within the scope of practice of the Paramedic.

Indications:
Chest tubes are typically indicated for pneumothorax, hemothorax and pleural empyema.

Inter-Facility Care:

A. Follow generalized protocol for Enhanced Care transports.
    1. Consult with the physician/staff for the best patient positioning.
B. Chest tube
    1. Assure that the chest tube(s) is securely fastened to the patient.
    2. Check chest tube(s) for patency and proper function prior to transport.
C. Drainage system
    1. Assure that the long flexible tubing is securely fastened to the container that acts as a drainage device, water seal and suction control device. Assure that the tubing is free of kinks.
    2. Make note of the fluid and blood levels in the drainage and water seal compartments.
    3. Obtain orders as to the water seal level or suction control setting.
    4. When suction is used, assure that there is bubbling in the suction control chamber. (If not, check the suction unit).
    5. Always maintain the drainage unit in a position below the level of the patient's chest.
D. Troubleshooting
    1. If the water seal fails to stop bubbling after the lung is reinflated or later begins to bubble:
        i. Momentarily clamp the flexible tubing near the chest. If the bubbles quit emanating from the tube while it is clamped, then the problem is either a persistent air leak in the patient's lung or the chest tube is not sealed at the chest wall.
        ii. NEVER LEAVE THE CLAMP ON FOR MORE THAN A 30 SECONDS.
        iii. Evaluate the insertion site.
        iv. Apply occlusive dressings to the site (during exhalation).
        v. Evaluate the patient for distress.
        vi. Consult Medical Control immediately if needed.
    2. If the bubbling does not cease during the clamping of the proximal end, then suspect a leak at a connection site in the tubing or the drainage unit.

i. Check all connections and secure with tape.
ii. Seal the leak with occlusive dressing and tape or replace the tubing. When replacing the tubing, remember to clamp the distal end of the chest tube to avoid the formation of a pneumothorax.
iii. If the chest drainage unit becomes damaged, a temporary water seal can be improvised by putting the drainage tubing into a bottle of sterile saline. Keep this device and tubing below chest level. Alternatively, place a Heimlich valve on the end of the chest tube and secure with tape.
iv. To clear clots from the tubing, squeeze the proximal end of the tubing with one hand and with the other below, squeeze the tube, milking the material down the tube toward the drainage container.
v. If the chest tube is not functioning and a tension pneumothorax is suspected, perform a needle decompression of the affected side.

See Protocol Supplement 11.04(s) for current OSF – St Francis Hospital chest seal/suction control/drainage collection device.

Chest Tube – Supplement

OSF – St Francis Hospital chest seal/suction control/drainage collection device.

S-1100 SERIES – DRY SUCTION / DRY SEAL

SAMPLING/ATS OPTION

- *Self-sealing sample port for direct collection requires no needles*
- *Easily connected ATS Bag makes collection/reinfusion simple*

ACCURATE DRY SUCTION

- *Maintains a constant suction level, variable between -10 to -40 cm*
- *Dial clicks in place at prescribed suction level*

SUCTION CONROL

- *Orange Float appears in the window when desired suction level has been attained*
- *Operates with reduced airflow capacity of a minimum of 6 liters per minute (LPM)*

PATIENT PROTECTION

- *Integrated **One-Way Valve** protects patient seal upon tipover*
- *Patient is protected from re-entry of atmospheric air*

SAFETY

- ***Positive Pressure Relief Valve** opens with increases in positive pressure, preventing pressure accumulation*
- ***Filtered High Negativity Relief Valve** provided to vent excessive negativity*
- ***Negative Pressure Indicator** confirms negative pressure on patient side of seal*

FOUR COLUMN COLLECTION CHAMBER

- *Provides a more accurate patient reading*
- *First chamber shows 2 cc increments up to 200 cc for accurate recording*

DIAGNOSTICS

*Optional filling of **Patient Air Leak Meter** visually quantifies the size and progress of air leak*

- *Packaged with a 20 cc pre-filled water syringe*

Date: August 2021 (rev Aug 2023) Section 11-06

Intravenous Medication Pumps

The purpose of this protocol is to provide guidance in the use of intravenous medication pumps and medications during inter-facility patient transfers.

A. Training:
Only personnel trained under an approved Delta County expanded scope curriculum (EPIC) may transport patients receiving medications listed in the expanded scope of practice.

B. Procedure:

1. Medications/fluids/blood products requiring the use of an IV infusion pump may be continued during transport by MCA approved ALS personnel. The medications may be monitored by the attending paramedic and may NOT be initiated as a new infusion.

2. Medications infused via the infusion pump will be supplied by and initiated at the sending facility. Paramedics must receive training in the use of any medication being administered.

3. The infusion pump may be supplied by the sending facility, or by the ALS provider.

4. Paramedics must have received specific training in the use of the intravenous pump being utilized for the administration of the infusion and have access to the Directions for Use.

5. Written physician orders must accompany the patient and include, at a minimum:
    a. Rate of infusion
    b. Titration parameters (if any)

6. Specific Delta County medication protocols may be referenced by the physician as an order for those medications.

7. Delta County medication protocols will be followed in a circumstance not covered by written physician order.

8. If a medication is being administered that is not on the expanded scope of practice list, the transfer should be considered outside the Paramedic expanded scope of practice. Appropriate additional clinical personnel should be considered to accompany the patient, or the transfer should be made by Critical Care transport personnel (ground or air).

9. In emergency situations, Just-in-time training of EMS personnel may be considered for novel medications.

Ventilators

This protocol outlines considerations in the use of mechanical ventilators during inter-facility transport. It provides for the continuation of ventilator controlled respirations on an intubated patient that is being transported to another care facility (typically a referral hospital). This protocol is for Paramedics only.

Adverse Effects/Complications:

1. Increased intra-thoracic pressure
2. Decrease venous return to the heart and decrease cardiac output (hypotension, tachycardia)
3. Increased V/Q mismatch (shunt)
4. Decrease blood flow to the kidney with resultant edema
5. Air trapping and intrinsic PEEP (auto PEEP)
6. Barotrauma
7. Nosocomial infections of the lungs and sinuses
8. Respiratory alkalosis
9. Agitation and increased respiratory distress
10. Increased work of breathing

Procedure:

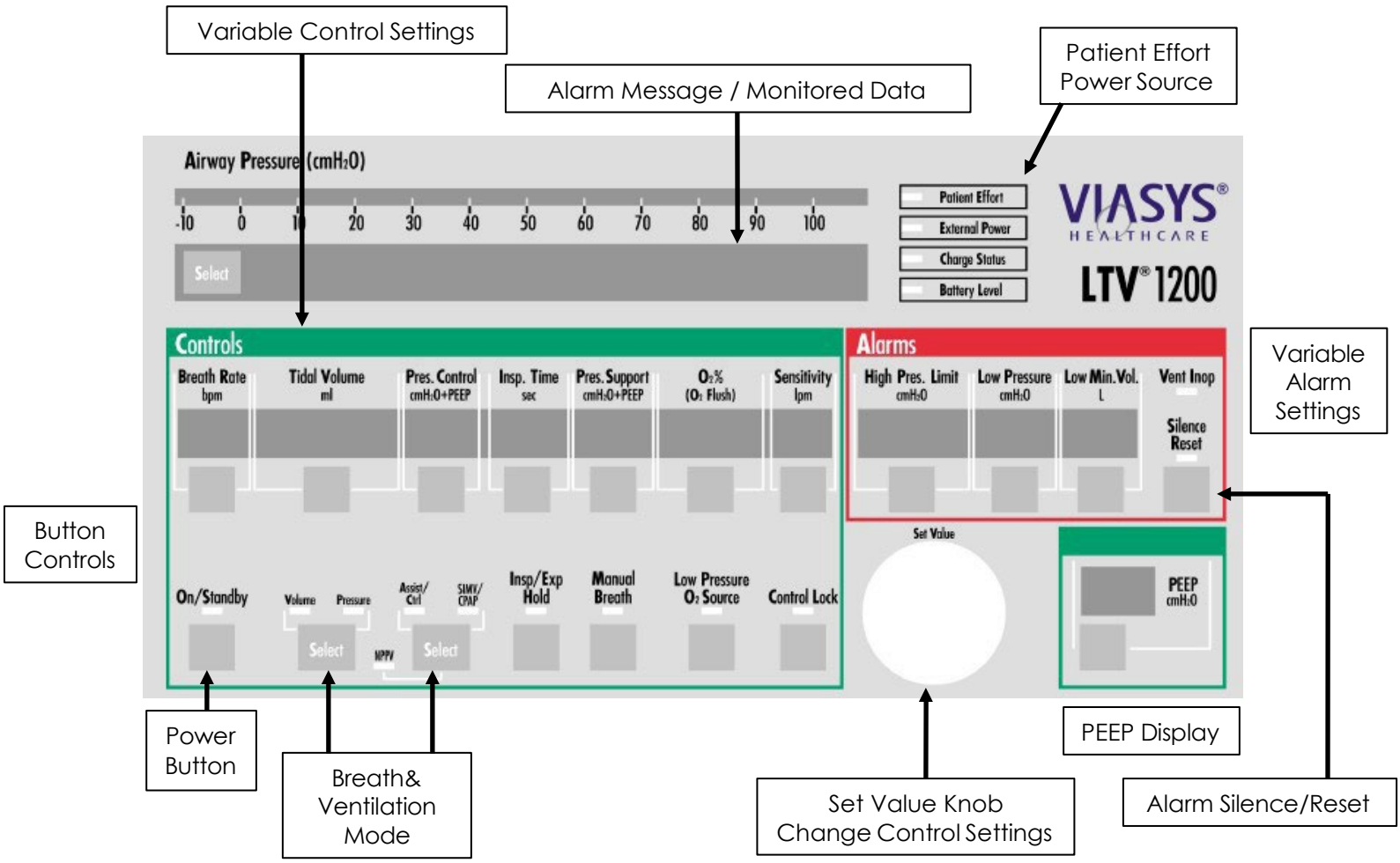
1. The patient will have been placed on the ventilator by the sending facility.
2. Ventilator settings will have been established by the sending physician and administered by registered respiratory therapists.
3. A bag-valve mask (BVM) resuscitator will always be at hand in case of ventilator failure.
4. Patient lung sounds should be checked, and tube placement verified by end tidal capnometry. Tube placement must be verified by auscultation and capnography each time the patient is moved; for example, from the bed to the stretcher or into or out of a vehicle.
5. Continuous monitoring with end-tidal CO_2 detection and pulse oximetry will be used on all patients. All patients will have continuous ECG monitoring and Q15 minute BPs.
6. Patient should be placed on the ventilator a minimum of 5 minutes prior to departure (to ensure patient is tolerating the ventilator). Adjustments should be made prior to departure.
7. Ensure adequate vascular access.

8. Initial patient assessment:
    a) Inquire if patient has any spontaneous respiratory effort or is 100% dependent on the ventilator.
    b) The most recent ABG should be obtained when available.
    c) Assess the ET tube placement to assure it is properly secured. Document tube depth at level of central incisors or alveolar ridge.
    d) Assess and document BP, SaO_2, $ETCO_2$, heart rate and ECG rhythm prior to departure.
9. Check orders for the following ventilator settings:
    a) Mode
    b) FiO_2
    c) Tidal Volume (Vt)
    d) Rate (RR)
    e) Pressure support (PS)
    f) PEEP
10. Document:
    a) Ventilator settings
    b) Rate (this may differ from the set rate if patient is not paralyzed)
    c) Tidal volume (delivered)
    d) Peak pressure
11. Prior to departure, determine which parameters are variable and under what circumstances.
    a) Hypoxia – is corrected by adjusting FiO_2 and/or PEEP.
        1) FiO_2 is increased as the initial intervention to improve SaO_2.
        2) Increases in PEEP may be considered after the FiO_2 is at 100%
    b) Hypercarbia (acidosis) – corrected by adjusting RR and/or Vt.
        1) RR is increased as the initial intervention to normalize CO_2.
        2) Vt should not be increased above 8 ml/kg IBW
12. Patients not tolerating the ventilator should have airway adequacy rechecked.
    a) Closely monitor SaO_2, $ETCO_2$, signs of labored respirations, chest rise, and pulse rate, BP or any signs suggestive of hypoxia and/or distress.
    b) If the airway is adequate and the ventilator is not functioning properly, the patient should be removed from the ventilator and ventilated manually via bag-valve ventilation.
    c) If the problem is with the patient and the ventilator is functioning properly, consider adjustments in analgesia/sedation.

13. Intubated patients should have analgesia/sedation administered to treat pain associated with intubation. Refer to the **Patient Sedation**, **Fentanyl**, **Ketamine**, **Midazolam**, and/or **Morphine** protocols as appropriate.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transports.
2. Ensure adequate analgesia/sedation prior to departure. Refer to Inter-facility **Patient Sedation** protocol.
3. Obtain sedation starting dose and titration parameters from sending facility physician prior to departure.
4. Obtain sedation endpoint from sending facility prior to departure.
5. Contact Medical Control prior to changing any ventilator parameter not specified in transfer orders; with the exception of:
    a) FiO_2 to maintain SaO_2 > 94%
    b) $ETCO_2$ may be considered to adjust RR if $ETCO_2$ <35 or >45.



VENTILATOR ALARMS

Alarm	Potential Causes	Potential Solutions
High Pressure	**Excessive pressure in the system:**	
	Secretions	Suction patient
	Bronchospasm	Bronchodilator treatment
	Kink in tubing	Eliminate kink, biting, obstructed filter
	Coughing	Suction patient, consider increasing sedation
	Pneumothorax	Pleural Decompression protocol
	Patient anxiety	Patient Sedation protocol
Low Pressure or Circuit Disconnect	**Acute drop in ventilating pressure:**	
	Circuit or connection leak	Reconnect circuit
	Cuff leak (evident by oral sound)	Add air to cuff
	Patient disconnect	Reconnect patient to vent
	Low oxygen supply	Check oxygen supply
High Volume (MV or Vt)	**Increase in exhaled volume:**	
	Increased respiratory rate	*See High Respiratory Rate Section*
	Increased Vt	Evaluate and correct cause
Low Volume (MV or Vt)	**Decrease in expired volume:**	
	Leak in system	Correct cause of leak
	Obstruction	Correct cause (filter, kink, etc)
	High pressure limiting volume	Evaluate and correct cause
High Respiratory Rate	**RR higher than alarm setting:**	
	Tachypnea	Evaluate and correct (*i.e.* pain, hypoxia)
	Coughing	Suction, consider increase sedation
	Auto-cycling	Evaluate cause and correct (secretions, leak)
Vent Inoperability	Power loss	If any occur, immediately remove from ventilator and manually ventilate. Notify Medical Control. Correct malfunction if possible after ensuring continued ventilation.
	Gas supply loss	
	Circuit occlusion	
If unable to identify cause or correct alarm – manually ventilate and notify Medical Control		

Inter-facility Patient Sedation

Purpose: Sedation of intubated patients requiring mechanical ventilation. This procedure is for Paramedic use only.

Contraindications:

1. Known allergy to sedation medications.

Assessment:

1. Evaluate adequacy of airway, ventilation, and oxygenation.
2. Monitor vital signs and level of consciousness (RASS score).
3. Monitor ECG.
4. Monitor pulse oximetry.
5. Monitor waveform capnography.

Procedure:

1. Maintain airway, provide oxygenation, and support ventilation.
2. Ensure vascular access with minimum of two patent sites.
3. Ensure sedation of the patient to a level of consciousness where ventilation can be maintained per physician orders.
4. Obtain orders for medication(s), starting dose, and titration parameters from the sending physician prior to departure.
5. Administer starting dose a minimum of 5 minutes prior to departure.
6. The patient should demonstrate an adequate level of sedation prior to departure.
7. Check orders for the desired level of sedation per the RASS evaluation tool.
8. Medical Control must be contacted if a change in sedation medication is needed.

Signs of inadequate sedation or analgesia:

1. Unexplained tachycardia and/or hypertension.
2. Facial grimacing or jaw clenching.
3. Swallowing efforts.
4. Tears.
5. Agitation.
6. Movement of extremities.
7. Posturing.
8. High airway pressure/resistance.

THE RICHMOND AGITATION-SEDATION SCALE (RASS)

+ 4	Combative	Combative, violent, immediate danger to staff
+ 3	Very agitated	Pulls to remove tubes or catheters; aggressive
+ 2	Agitated	Frequent non purposeful movement; fights ventilator
+ 1	Restless	Anxious, apprehensive, movements not aggressive
0	Alert and calm	Spontaneously pays attention to caregiver
- 1	Drowsy	Not fully alert but has sustained awakening to voice (eye opening and contact >10 seconds)
- 2	Light sedation	Briefly awakens to voice (eyes open and contact <10 seconds)
- 3	Moderate sedation	Movement of eye opening to voice (no eye contact)
- 4	Deep sedation	No response to voice but movement or eye opening to physical stimulation
- 5	Unarousable	No response to voice or physical stimulation

Procedure for RASS assessment	**Score**
1. Observe patient. • Patient is alert, restless, or agitated.	0 to + 4
2. If not alert, state patient's name and tell patient to open eyes and look at speaker. • Patient awakens with sustained eye opening and eye contact. • Patient awakens with eye opening and eye contact, but not sustained. • Patient has any movement in response to voice but no eye contact.	- 1 - 2 – 3
3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum. • Patient has any movement to physical stimulation. • Patient has no response to any stimulation.	- 4 - 5

Date: April 2020 (rev Nov 2021) Section 11-09

Amiodarone

Indications: Cardiac dysrhythmias in the adult patient. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Known allergy.
2. Cardiogenic shock
3. Severe sinus node dysfunction*.
4. 2°/3° heart block*.
5. Bradycardia with syncope*.
   *except with functioning artificial pacemaker

Adverse Effects:

1. Hypotension.
2. Bradycardia, AV block.
3. Prolonged QTc and Torsades de Pointes.

General:

1. Amiodarone is a Class III antiarrhythmic agent.
2. Indicated for ventricular fibrillation and hemodynamically unstable ventricular tachycardia.
3. Used for hemodynamically stable ventricular tachycardia (monomorphic or polymorphic) or wide-complex tachycardia of unknown origin.
4. Used for atrial fibrillation, atrial flutter, or paroxysmal supraventricular tachycardia (PSVT).

Administration:

1. Loading dose:
   a. 150 mg over 10 min (15 mg/min).
2. IV continuous infusion:
   a. Infusion comes standard as premix bag (360mg/200ml = 18mg/ml)
   b. Infusion rate is 1 **mg**/min for 6 hours, then 0.5 **mg**/min for 18 hours.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Discontinue if BP 90 mmHg systolic or less.
3. Discontinue if bradycardia or new heart block develops.
4. Contact Medical Control if adverse reaction noted or suspected.

Diltiazem

Indications: The primary indications for the **adult** inter-facility transfer patient are Paroxysmal Supraventricular Tachycardia and Atrial Fibrillation/Flutter. Other uses include angina and hypertension, but not in this context. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Known allergy.
2. BP < 90 mmHg systolic.
3. CHF & cardiogenic shock.
4. WPW & LGL syndromes.
5. 2°/3° heart block (without an artificial pacemaker).
6. Sick Sinus Syndrome (without an artificial pacemaker).
7. V-Tach
8. Concomitant beta-blocker therapy.

Adverse Effects:

1. Hypotension.
2. Heart block.
3. CHF.
4. VF/V-tach

General:

1. Diltiazem is a calcium-channel blocker.
2. Dilates coronary and systemic arteries.
3. Inhibits cardiac conduction principally at the AV node.

Administration:

1. Push dose:
    a. 0.25 mg/kg IVP over 2 minutes.
    b. After 15 minutes may repeat by administering 0.35 mg/kg over 2 min.
    c. Dosage is calculated based on actual body weight.
    d. Additional IVP doses may be ordered q15 min.
2. IV continuous infusion:
    a. Drip is premixed infusion, 125mg/125ml (1mg/ml)
    b. 10 mg/hour IV initially.
    c. May titrate per written orders of sending provider.
    d. Maximum dose is15 mg/hour (for up to 24 hours).
3. Continuous ECG and BP monitoring is required during administration.

MCA: Delta County
MCA Board Approval Date: 23 Feb 2022
MDHHS Approval Date: 25 March 2022
MCA Implementation Date: 1 April 2022

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain infusion rate and titration parameters from sending facility physician prior to departure.
3. Hold dose if BP 90 mmHg systolic or less.
4. Hold dose if new heart block or evidence of CHF.
5. Contact Medical Control if adverse reaction occurs or is suspected.

NOTE:
Intermittent dosing may be the only option during periods of drug shortage. If adequate supply is available continuous infusion, is the preferred option.

MCA: Delta County
MCA Board Approval Date: 23 Feb 2022
MDHHS Approval Date: 25 March 2022
MCA Implementation Date: 1 April 2022

Dobutamine

Indications: Dobutamine is an adrenergic agent used to improve cardiac output. Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components (typically - sulfite allergy).
2. Idiopathic hypertrophic subaortic stenosis.

Adverse effects:

1. Causes increased blood pressure (especially systolic).
2. Causes increased heart rate (less so than other adrenergic medications).
3. May result in worsening of cardiac ischemia.
4. May precipitate or exacerbate atrial and ventricular ectopy.
5. May promote a rapid ventricular response, especially in atrial fibrillation.
6. Rarely, hypotension may occur.

General:

1. Dobutamine is a direct-acting positive inotropic agent (β receptor).
2. Used for the treatment of cardiogenic shock and severe heart failure.
3. Hypovolemia should be corrected prior to the administration of dobutamine.
4. Dobutamine should not be mixed with other medications in the same solution.
5. Available as a pre-mixed solution.

Administration:

1. Must be administered via an infusion pump into a large vein.
2. Initial dose: 0.5 to 1 **mcg**/kg/min
3. IV continuous infusion: 2 to 20 **mcg**/kg/min.
4. Maximum dose rate: 40 **mcg**/kg/min.
5. May titrate 2 **mcg**/kg/min every 5 min to desired effect (SBP, UO).
6. Monitoring: Continuous ECG and blood pressure monitoring during infusion.
7. Hold dose and contact Medical Control if hypertension or hypotension, tachycardia, or ventricular ectopy occurs.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue if ventricular tachycardia develops.
4. Contact Medical Control if any adverse reaction is noted or suspected.

SBP – systolic blood pressure
UO – urine output

Dopamine

Indications: Dopamine is an adrenergic agent used to improve cardiac output, blood pressure, and renal blood flow. Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components (typically - sulfite allergy).
2. Pheochromocytoma.
3. Uncorrected tachyarrhythmias.

Adverse effects:

1. Causes increased blood pressure.
2. Causes increased heart rate.
3. May cause increased systemic vascular resistance.
4. May result in worsening of cardiac ischemia.
5. May precipitate or exacerbate atrial and ventricular ectopy.
6. May promote a rapid ventricular response.
7. Extravasation may cause tissue necrosis.

General:

1. Dopamine is an adrenergic agent with α, β and dopaminergic effects.
2. Dopamine effects are dose related:
    a. α (alpha) effects: > 10 **mcg**/kg/min
    b. β1 (beta) effects: 2-10 **mcg**/kg/min
    c. Dopaminergic (renal) effects: 0.5-2 **mcg**/kg/min
3. Used for the treatment of cardiogenic shock, heart failure, and poor tissue perfusion.
4. Hypovolemia should be corrected prior to the administration of dopamine.
5. Dopamine should not be mixed with an alkaline solution.
6. Available as a pre-mix solution.

Administration:

1. Must be administered via an infusion pump into a large vein.
2. Initial dose: 2 to 5 **mcg**/kg/min.
3. IV continuous infusion: 2 to 20 **mcg**/kg/min.
4. Maximum dose rate: 50 **mcg**/kg/min.
5. May titrate 2 - 5 **mcg**/kg/min every 5 min to desired effect (SBP, HR, UO).
6. Monitoring: Continuous ECG and blood pressure monitoring during infusion.

SBP – systolic blood pressure
HR – heart rate
UO – urine output

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue if ventricular tachycardia or significant hypotension develops.
4. Contact Medical Control if hypertension, tachycardia, or ventricular ectopy occurs. The infusion may need to be weaned to avoid onset of sudden hypotension.
5. Contact Medical Control if any adverse reaction is noted or suspected.

Epinephrine

Indications: Epinephrine is an adrenergic agent with a and β effects. It is used for the treatment of hypotension in septic shock, and symptomatic bradycardia (unresponsive to atropine or pacing). Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Eclampsia.
2. Pheochromocytoma.
3. Thyrotoxicosis.
4. Uncorrected tachyarrhythmias.

Adverse effects:

1. Causes increased blood pressure.
2. Causes increased heart rate.
3. Causes increased systemic vascular resistance.
4. Risk of pulmonary edema.
5. Risk of cerebrovascular hemorrhage.
6. May result in worsening of cardiac ischemia.
7. May precipitate or exacerbate atrial and ventricular ectopy.
8. May promote a rapid ventricular response.
9. Extravasation may cause tissue necrosis.

General:

1. Hypovolemia should be corrected prior to the administration of epinephrine.
2. Epinephrine should not be mixed with an alkaline solution.
3. Available as a pre-mix solution.

Administration:

1. Must be administered via an infusion pump into a large vein.
2. IV continuous infusion (for shock): 0.05 to 2 **mcg**/kg/min.
3. IV continuous infusion (for bradycardia): 0.1 to 0.5 **mcg**/kg/min.
4. Maximum dose rate (typical): 10 **mcg**/kg/min.
5. May titrate 0.05 to 0.2 **mcg**/kg/min every 10 min to desired effect (SBP, HR).
6. Monitoring: Continuous ECG and blood pressure monitoring during infusion.

SBP – systolic blood pressure
HR – heart rate

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transports.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue if ventricular tachycardia or ventricular fibrillation develops.
4. Contact Medical Control if hypertension, tachycardia, or persistent ventricular ectopy occurs.
5. Contact Medical Control if any adverse reaction noted or suspected.

Esmolol

Indications: Esmolol is an ultra-short acting beta blocker used to control supraventricular tachycardia and for the treatment of hypertensive emergencies. Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components.
2. Bradycardia.
3. 2º / 3º heart block.
4. Sick sinus syndrome.
5. Cardiogenic shock.
6. Decompensated heart failure.
7. Pulmonary hypertension.

Adverse effects:

1. May cause hypotension.
2. May cause symptomatic bradycardia.
3. May result in bronchospasm.
4. May worsen heart failure.
5. In pheochromocytoma, esmolol may precipitate a paradoxical increase in BP unless an alpha blocking agent is first administered.

General:

1. Esmolol is an ultra-short acting β-blocker.
2. Is not compatible with sodium bicarbonate or furosemide.
3. Avoid concomitant administration with Ca-channel blockers .
4. Available as a pre-mix solution.

Administration:

1. Must be administered via an infusion pump.
2. Loading dose: 500 **mcg**/kg over one min.
3. IV continuous infusion: 25 to 200 **mcg**/kg/min.
4. Maximum dose rate: 200 **mcg**/kg/min.
5. May titrate 50 **mcg**/kg/min every 5 min to desired effect (SBP, HR).
6. Monitoring: Continuous ECG and blood pressure monitoring during infusion.

SBP – systolic blood pressure
HR – heart rate

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue if hypotension, severe bradycardia, bronchospasm, or cardiac decompensation.
4. Contact Medical Control if any adverse reaction is noted or suspected.

Fentanyl

Indications: Inter-facility IV analgesia/sedation of the **adult** intubated and mechanically ventilated patient. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Known allergy.
2. Hypotension.

Adverse Effects:

1. Respiratory depression, apnea, hypoxia.
2. Nausea and vomiting.
3. Allergic reaction.

General:

1. Fentanyl is an opioid analgesic agonist.
2. Used to provide analgesia and sedation.
3. Less likely to cause hypotension than morphine.

Administration:

1. Push dose for intermittent dosing:
    a. 50 - 100 **mcg** initial dose IVP over 30 – 60 seconds (specific dose as ordered by physician).
    b. 50 - 100 **mcg** IVP incremental doses every 30 minutes as indicated to maintain desired analgesia/sedation (specific dose as ordered by physician).
    c. Maximum dose is 200 mcg per hour.
    d. Sedation endpoint is per sending orders or when BP is 90 mmHg systolic or less.
2. IV continuous infusion:
    a. Drip is prepared as 10 **mcg**/ml (500 **mcg**/50ml 0.9% saline).
    b. Initial dose 50 **mcg** IVP over 30 – 60 seconds.
    c. Infusion rate is 50 - 200 **mcg**/hr.
    d. Generally, begin infusion at 50 **mcg**/hr
    e. Titrate drip 25 **mcg**/hr every 30 minutes as needed to maintain sedation (up to maximum of 200 **mcg**/hr).
    f. Give 25 **mcg** IVP with each titration increase.
    g. Sedation endpoint is per sending orders or when BP is 90 mmHg systolic or less.

MCA: Delta County
MCA Board Approval Date: April 9, 2020
MDHHS Approval Date: May 22, 2020
MCA Implementation Date: August 1, 2020

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transports.
2. Follow Inter-facility **Patient Sedation Protocol**.
3. Obtain starting dose and titration parameters from sending facility physician prior to departure.
4. Ensure adequate sedation prior to departure. Refer to Inter-facility **Patient Sedation Protocol**.
5. Obtain sedation endpoint from sending facility prior to departure.
6. Hold dose if BP 90 mmHg systolic or less.

NOTE:
Intermittent dosing may be the only option during periods of drug shortage. If adequate supply is available continuous infusion is the preferred option.

MCA: Delta County
MCA Board Approval Date: April 9, 2020
MDHHS Approval Date: May 22, 2020
MCA Implementation Date: August 1, 2020

Fosphenytoin

Indications: Fosphenytoin is an anticonvulsant used to prevent or control seizures, including status epilepticus. The loading dose is initiated by the sending facility and may be continued by the Paramedic. It is unlikely that a maintenance dose will be administered by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components.
2. Sinus bradycardia.
3. Sino-atrial block.
4. 2º or 3º heart block.
5. Adams-Stokes syndrome.

Adverse effects:

1. May cause severe hypotension.
2. May cause cardiac arrhythmias to include:
    a. Bradycardia.
    b. Heart block.
    c. QT interval prolongation.
    d. VT and VF.
3. May result in local toxicity "purple glove syndrome".

General:

1. Fosphenytoin is a phenytoin equivalent used when phenytoin cannot be administered.
2. The dose, concentration, and infusion rate of Fosphenytoin Sodium Injection should always be expressed as phenytoin sodium equivalents (PE).
3. The rate of intravenous Fosphenytoin infusion should not exceed 150 mg phenytoin sodium equivalents (PE) per minute due to the risk of severe hypotension and cardiac arrhythmias.
4. Because the full antiepileptic effect of phenytoin is not immediate, the concomitant use of a benzodiazepine will usually be necessary for the control of status epilepticus.
5. The maximum concentration of fosphenytoin sodium Injection in any solution should be 25 mg PE/ml.

Administration:

1. Must be administered via an infusion pump.
2. Loading dose: 15 to 20 mg PE/kg administered at 100 to 150 mg PE/min.
3. Maximum dose rate: 10 to 15 mg PE/kg at a rate of 1 to 2 mg PE/kg/min (or 150 mg PE/min, whichever is slower).
4. Maintenance Dose: 4 to 6 mg PE/kg/day in divided doses as ordered.
5. Monitoring: Continuous cardiac and BP monitoring during administration.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue or reduce rate of infusion if hypotension and/or cardiac dysrhythmia is noted.
4. If the infusion is discontinued, administration of a benzodiazepine may be required to avoid onset of withdrawal seizures.
5. Contact Medical Control if any adverse reaction is noted or suspected.

Heparin - unfractionated heparin (UFH)

Indications: Heparin is an anticoagulant used in the treatment of thrombosis (DVT) and embolism (PE). It may also be administered in ACS, NSTEMI and STEMI. This protocol refers to the administration of UFH and not to the use of low molecular weight heparin (LMWH). Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components (pork products, sulfite).
2. History of heparin-induced thrombocytopenia (HIT) or heparin-induced thrombocytopenia with thrombosis (HITT).
3. Uncontrolled active bleeding state, except when this is due to disseminated intravascular coagulation (DIC).

Adverse effects:

1. May cause bleeding (serious hemorrhage).
2. Use with caution if any risk factor for hemorrhage.

General:

1. Is not compatible (in the same IV line) with amiodarone, diazepam, dobutamine, and haloperidol.
2. Infusion solution is provided by the sending facility.

Administration:

1. Must be administered via an infusion pump.
2. DVT and PE
    a. Loading dose: 80 units/kg IV bolus (max: 5000 units IV bolus) *then*:
    b. IV continuous infusion: 18 units/kg/hr (or 1300 units/hr).
3. STEMI
    a. Loading dose: 60 units/kg (max: 4000 units) IV bolus *then*:
    b. IV continuous infusion: 12 units/kg/hr (max 1000 units/hr).
4. Monitoring: Measurement of aPTT is not available during transport.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain bolus dose and infusion rate from sending facility physician prior to departure.
3. Discontinue if active bleeding.
4. Contact Medical Control if there is new bleeding.
5. Contact Medical Control if any adverse reaction is noted or suspected.

Hydromorphone

Indications: Hydromorphone is an opioid analgesic used for control of pain. Hydromorphone is not administered as an Infusion. Intermittent IM or IV administration may be continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components.
2. Known or suspected gastrointestinal obstruction, including paralytic ileus.
3. Circulatory shock.

Adverse effects:

1. May cause respiratory depression or arrest.
2. May cause altered mental status to include excessive sedation.
3. May cause severe hypotension.
4. May worsen CO_2 retention in pulmonary disorders.
5. May increase the risk of seizures in clinical settings associated with seizures.

General:

1. Exercise caution in concomitant administration with other sedative agents.
2. Acute overdose can be manifested by respiratory depression, stupor or coma, skeletal muscle flaccidity, and signs of shock. In some cases, pulmonary edema, bradycardia, and hypotension may occur. Marked mydriasis rather than miosis may be seen with hypoxia in overdose situations.

Administration:

1. Initial **IV** dose: 0.2 mg to 1 mg over 2 – 3 min.
2. Initial **IM** dose: 1 - 2 mg.
3. May repeat (IV or IM) every 2 - 3 hours to desired effect.
4. Maximum dose: The lowest dose to achieve adequate pain control should be used.
5. Monitoring: SpO_2 and $ETCO_2$ for signs of respiratory depression.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain initial and subsequent dose range from sending facility physician prior to departure.
3. Discontinue if signs of respiratory depression or hypotension are noted.
4. Contact Medical Control if any adverse reaction is noted or suspected.

Insulin (regular)

Indications: This protocol applies to the use of a continuous insulin Infusion in the treatment of diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic state (HHS). Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components.
2. Hypoglycemia.

Adverse effects:

1. May cause hypoglycemia.
2. May cause hypokalemia.
3. May result in sodium retention and edema.
4. Over correction of blood glucose may result in severe hypoglycemia with little or no warning.

General:

1. Treatment of DKA and HHS includes:
    a. Correction of fluid loss with intravenous fluids,
    b. Correction of electrolyte disturbances, particularly potassium loss,
    c. Correction of acid-base balance, and
    d. Correction of hyperglycemia with insulin.
2. The solution will be prepared and supplied by the hospital pharmacy.

Administration:

1. Must be administered via an infusion pump.
2. Loading dose: 0.15 Units/kg bolus may be ordered for severe acidosis.
3. IV continuous infusion: 0.1Unit/kg/hr.
4. With severe acidosis or insulin resistance, a dose rate of 0.2 – 0.3 Units/kg/hr may be ordered.
5. Maximum dose rate: 15 Units/hr (in morbid obesity).
6. Monitoring: blood glucose (fingerstick) every 30 minutes.
7. When blood glucose falls to 250 mg/dL the infusion rate should be decreased to 0.05 Units/kg/hr. Addition of 10% glucose may be ordered at this point.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Avoid stopping the insulin infusion entirely, if possible.
4. Discontinue if signs of allergic reaction.
5. Contact Medical Control if any adverse reaction is noted or suspected.

Ketamine

Indications: Inter-facility IV sedation. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1) Allergy to Ketamine.
2) Children under age 2.

Adverse Effects:

1) Hypertension / tachycardia.
2) Emergence phenomenon.

General:

1) Ketamine is a dissociative anesthetic indicated for both induction and maintenance of anesthesia.
2) **Ketamine provides analgesia, sedation, and amnesia**.
3) Ketamine preserves respiration and airway reflexes.
4) Ketamine supports heart rate and blood pressure.
5) Ketamine causes bronchodilation. It may increase saliva production.
6) Do not use with airway devices other than endotracheal tubes due to risk of laryngospasm. (Do not use with supraglottic airways.)

Administration:

1) Initial dose 1 - 2 mg/kg slow IVP.
2) Followed by Ketamine infusion at 1 - 10 **mcg**/kg/**min** IV for intubated patients.
3) Infusion is prepared as 250mg in 250ml 0.9% saline (1mg/ml)
4) Start infusion at 1 **mcg**/kg/**min** IV.
5) Titrate by 1 **mcg**/kg/**min** every 30 min to maintain desired level of sedation.

MCA: Delta
MCA Board Approval Date: April 9, 2020
MDHHS Approval Date: May 22, 2020
MCA Implementation Date: August 1, 2020

Date: October 2019(revised Nov 2021) Section 11-20

Inter-Facility Directive:

1) Follow general inter-facility transfer protocol.
2) Follow Inter-facility **Patient Sedation Protocol**.
3) Obtain starting dose and titration parameters from sending facility physician prior to departure.
4) Ensure adequate sedation prior to departure. Refer to inter-facility **Patient Sedation Protocol**.
5) Obtain sedation endpoint from sending facility prior to departure.
6) Discontinue if patient develops signs of hypersensitivity or hemodynamic instability, severe tachycardia, or significant hypertension.
7) Eliminate inadequate sedation as the cause of tachycardia or hypertension before discontinuation.

MCA: Delta
MCA Board Approval Date: April 9, 2020
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MCA Implementation Date: August 1, 2020

Labetalol

Indications: Labetalol is a non-cardioselective beta-blocker used in severe hypertension to lower blood pressure. Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Hypersensitivity to drug or components.
2. Severe sinus bradycardia.
3. Heart block greater than first degree.
4. Cardiogenic shock.
5. IV calcium-channel blockers.
6. Bronchial asthma or obstructive airway disease.

Adverse effects:

1. May cause symptomatic postural hypotension.
2. May cause severe bradycardia, including sinus pause, heart block, and cardiac arrest.
3. May cause bronchospasm.
4. May worsen cardiac failure.
5. May result in Paradoxical hypertensive responses in patients with pheochromocytoma.

General:

1. Is not compatible with sodium bicarbonate.
2. Avoid concomitant administration with IV calcium channel blockers.
3. Avoid concomitant administration with nitroglycerine.
4. May be administered by repeated Intravenous Injection or continuous infusion.
5. The maximum effect usually occurs within 5 minutes of each injection.
6. Available as a pre-mix solution and as single dose syringe.

Administration:

1. Repeated Intravenous Injection: Initially 0.25 mg/kg up to 20 mg over 2 minutes. Then 40 - 80 mg IV q10min until the desired supine blood pressure is achieved.
2. Continuous infusion must be administered via an infusion pump.
3. IV continuous infusion: 0.5 - 2 mg/minute.
4. May titrate 0.5 - 1 mg every 10 min to desired effect (up to maximum of 10 mg/min).
5. Maximum total dose: 300 mg.
6. Monitoring: Blood pressure every 5 – 10 minutes.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue if signs of allergic reaction, 2° or 3° heart block, bradycardia (HR < 60), or hypotension.
4. Contact Medical Control if BP < 60.
5. Contact Medical Control if any adverse reaction is noted or suspected.

Lidocaine

Indications: Lidocaine is a Class Ib antiarrhythmic used to control ventricular arrhythmia. Lidocaine is also an amide-type local anesthetic which may be used to facilitate IV and IO cannula placement. When utilized as an antiarrhythmic, infusions are initiated by the sending facility and may be continued by the Paramedic. This protocol addresses the use of lidocaine in non-cardiac arrest situations. This Protocol is for Paramedic use only.

Contraindications:

1. Hypersensitivity to amide-type local anesthetics.
2. Adam-Stokes Syndrome, SA, AV, or intraventricular heart block (unless a functioning pacemaker is present).
3. CHF, cardiogenic shock, 2 **º** and 3 **º** heart block (if no pacemaker is present), Wolff-Parkinson-White Syndrome.

Adverse effects:

1. May cause hypotension, respiratory depression, and seizures.
2. May result in myocardial depression and worsening heart failure.
3. May worsen heart block.

General:

1. Is not compatible with blood transfusion lines.
2. Avoid concomitant administration with amiodarone.
3. Available as a pre-mix solution and pre-filled syringe.

Administration:

1. Infusions are administered via an infusion pump.
2. Initial dose: 1 – 1.5 mg/kg over 2 – 3 min.
3. Repeat doses of 0.5 - 0.75 mg/kg in 5 -10 minutes if arrythmia persists.
4. IV continuous infusion: 1 – 4 mg/min.
5. May titrate by 1 mg/min every 5 - 10 min to maximum of 4 mg/min.
6. Maximum dose: 3 mg/kg total.
7. Monitoring: Continuous ECG.
8. When used to facilitate IO placement, 5 mL of 2% lidocaine may be infused after access has been established to decrease pain and discomfort associated with the force of high-volume infusion.

MCA: Delta County
MCA Board Approval Date: 11/23/23
MDHHS Approval Date: 3/22/24
MCA Implementation Date: 3/22/24

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue infusion if signs of excessive depression of cardiac conduction occur (prolongation of PR interval and QRS complex, aggravation of arrhythmias).
4. Discontinue if seizure occurs.
5. Severe reactions may be preceded by somnolence, slurred speech, and paresthesia.
6. Contact Medical Control if any adverse reaction is noted or suspected.

Magnesium Sulfate

Indications: Magnesium sulfate is mineral salt electrolyte indicated in cardiac arrest, Torsades de Pointes, Pre-eclampsia & Eclampsia. This protocol does not supersede the following protocols: *Adult Cardiac Arrest(5.1), Adult Respiratory Distress(3.3), Adult seizures(3.4), or Childbirth & Related Obstetrical Emergencies(4.2)*. This protocol addresses those situations when $MgSO_4$ is ordered to be administered by continuous infusion. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Hypersensitivity.
2. Myocardiopathy.
3. Diabetic coma.
4. Heart block.
5. Hypercalcemia or hypermagnesemia.

Adverse Effects:

1. Hypotension and circulatory collapse.
2. Depressed cardiac function.
3. Respiratory paralysis.
4. Pulmonary edema.
5. Caution in renal impairment.
6. Caution in neuromuscular disease (*i.e.*, myasthenia gravis).

Administration:

1. Bolus and/or Intermittent dosing, see appropriate protocol.
    a. Adult Cardiac Arrest (5.1).
    b. Adult Respiratory Distress (3.3).
    c. Adult seizures (3.4).
    d. Childbirth & Related Obstetrical Emergencies (4.2).
2. **Eclampsia/preeclampsia**:
    a. Loading dose of 4 to 5 gm IV.
    b. 0.5 to 3 g/hr IV - rate as ordered.
    c. Maximum dose is 5 g/hr.

3. **Pre-term labor (tocolytic)**:
    a. Loading dose of 4 to 6 gm IV over 20 min.
    b. 2 to 4 gm/hr – rate as ordered

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Loss of deep tendon reflexes may indicate impending respiratory arrest. Hold dose and call Medical Control.

MCA: Delta
MCA Board Approval Date: 8/23/23
MDHHS Approval Date: 3/22/24
MCA Implementation Date: 3/22/24

Mannitol (Osmitrol)

Indications: Mannitol is an osmotic diuretic Indicated for reduction of intracranial pressure associated with cerebral edema and/or brain mass. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.
2. Active intracranial bleeding.
3. Hypovolemia (severe).
4. Pulmonary edema or severe pulmonary vascular congestion.
5. Anuria.

Adverse Effects:

1. Hypersensitivity reactions to include anaphylaxis.
2. CNS toxicity: headache, coma, seizures, confusion, lethargy; rebound increase in intracranial pressure.
3. Fluid and electrolyte imbalances: hypovolemia, hypervolemia, peripheral edema, dehydration, hyponatremia, hypernatremia, hyperkalemia, hypokalemia; metabolic acidosis.
4. Cardiac and respiratory: congestive cardiac failure, pulmonary edema, hypotension, hypertension, tachycardia, and angina-like chest pain.
5. Infusion site reactions: venous thrombosis, phlebitis, pain, rash, compartment syndrome.
6. Acute kidney injury, to include irreversible kidney failure.

Administration:

1. IV infusion:
    a. Solution is prepared and supplied by OSF pharmacy.
    b. 0.25 to 2 gm/kg over 30 to 60 minutes.
    c. Administer through a filtered administration set into a large vein.
    d. May repeat in 6 to 8 hours.
    e. Do not mix with blood.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Discontinue infusion if renal, cardiac, or pulmonary status worsens, or CNS toxicity develops.

Date: Oct 2019 (rev Mar 2022) Section 11-25

Midazolam (Versed)

Indications: Inter-facility IV sedation of the **adult** intubated and mechanically ventilated patient. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Known allergy.
2. Hypotension.

Adverse Effects:

1. Respiratory depression, apnea, hypoxia.
2. Nausea and vomiting.
3. Allergic reaction.

General:

1. Midazolam is a short-acting benzodiazepine.
2. Provides sedation, produces amnesia, and controls anxiety.
3. Midazolam does NOT provide analgesia.
4. For the control of acute repetitive seizures and status epilepticus.

Administration:

1. Push dose for intermittent dosing:
    a. 1 – 2 mg initial dose slow IVP over 30 - 60 seconds.
    b. 1 – 2 mg incremental doses every 5 minutes as indicated.
    c. Maximum dose is 20 mg in one hour.
    d. Sedation endpoint is per sending orders or when BP is 90 mmHg systolic or less.
2. IV continuous infusion:
    a. Infusion is prepared as 1mg/ml.
    b. Bolus 2 mg IV.
    c. Infusion rate is 1 - 20 mg/hr.
    d. Generally, begin infusion at 2 mg/hr
    e. Titrate drip 1 mg/hr every 30 minutes as needed to maintain sedation (up to 10 mg/hr).
    f. Every increase in the drip rate should be accompanied by a repeat bolus of 2 mg.
    g. Sedation endpoint is per sending orders or when BP is 90 mmHg systolic or less.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Follow Inter-facility **Patient Sedation Protocol**.
3. Obtain starting dose and titration parameters from sending facility physician prior to departure.
4. Ensure adequate sedation prior to departure. Refer to Inter-facility **Patient Sedation Protocol**.
5. Obtain sedation endpoint from sending facility prior to departure.
6. Hold dose if BP 90 mmHg systolic or less.

Morphine

Indications: Inter-facility IV analgesia/sedation of the **adult** intubated and mechanically ventilated patient. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Known allergy.
2. Hypotension.

Adverse Effects:

1. Respiratory depression, apnea, hypoxia.
2. Circulatory depression
3. Nausea and vomiting.
4. Allergic reaction.

General:

1. Morphine is an opioid analgesic agonist.
2. Used to provide analgesia and sedation.
3. Morphine causes the release of histamine, contributing to additional vasodilation and hypotension.

Administration:

1. Push dose for intermittent dosing:
    a. 2 - 10 mg initial dose IVP over 30 – 60 seconds (specific dose as ordered by physician).
    b. 2 – 4 mg IVP incremental doses every 30 minutes as indicated to maintain desired analgesia (specific dose as ordered by physician).
    c. Analgesia endpoint is per sending orders or when BP is 90 mmHg systolic or less.
    d. Maximum dose is 20 mg in one hour.
2. IV continuous infusion for analgesia/sedation:
    a. Drip is prepared as 1 mg/ml (50mg/50ml 0.9% saline).
    b. Initial dose 2 mg IVP over 30 – 60 seconds.
    c. Infusion rate is 2 – 20 mg/hr.
    d. Generally, begin infusion at 2 mg/hr.
    e. Titrate drip 1 mg/hr every 30 minutes as needed to maintain sedation(up to maximum of 10 mg/hr).
    f. Give 2 mg IVP with each titration increase (or specific dose as ordered by physician).
    g. Sedation endpoint is per sending orders or when BP is 90 mmHg systolic or less.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transports.
2. Follow Inter-facility **Patient Sedation Protocol**.
3. Obtain starting dose and titration parameters from sending facility physician prior to departure.
4. Ensure adequate sedation prior to departure. Refer to Inter-facility **Patient Sedation Protocol**.
5. Obtain sedation endpoint from sending facility prior to departure.
6. Hold dose if BP 90 mmHg systolic or less.

NOTE:
Intermittent dosing may be the only option during periods of drug shortage. If adequate supply is available continuous infusion may be the preferred option.

Nicardipine (Cardene)

Indications: Nicardipine is a calcium channel blocker used for the treatment of hypertension, angina, and pulmonary hypertension. IV nicardipine may be used for the treatment of hypertensive emergencies. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.
2. Aortic stenosis.
3. Severe left ventricular dysfunction.
4. Avoid in combination with beta-blocker.

Adverse Effects:

1. Hypotension.
2. Tachycardia.
3. Heart failure.
4. Headache.

Administration:

1. IV continuous infusion:
    a. Solution is prepared and supplied by OSF pharmacy.
    b. Dose range is 0.5 to 15 mg/hr.
    c. Usually, infusion is Initiated at 5 mg/hr.
    d. May titrate by 2.5 mg/hr every 5 to 15 min (to maximum of 15 mg/hr).
    e. Goal is to maintain SBP < 220 mmHg and < 110 mmHg.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Hold dose and call Medical Control if hypotension, sustained tachycardia, or signs of heart failure.

MCA: Delta
MCA Board Approval Date: 8/23/23
MDHHS Approval Date: 3/22/24
MCA Implementation Date: 3/22/24

Nitroprusside (Nipride)

Indications: Nitroprusside is indicated for the immediate control of blood pressure in hypertensive emergencies. If used in acute aortic dissection it is administered in combination with a beta-blocker. In acute heart failure it is used to reduce left ventricular end-diastolic pressure and systolic vascular resistance. It may be used to reduce cerebral vasospasm following subarachnoid hemorrhage. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.
2. Reduced peripheral vascular resistance (sepsis).
3. Head trauma with increased ICP.
4. Liver failure.
5. Pregnancy Category C – use only if benefit outweighs risk.

Adverse Effects:

1. Hypotension.
2. Reflex tachycardia, cardiac dysrhythmia.
3. Elevated ICP.
4. Decreased platelet aggregation with hemorrhage.
5. Cyanide toxicity, metabolic acidosis, methemoglobinemia thiocyanate toxicity.
6. Apprehension, restlessness, confusion, dizziness, headache, somnolence.

Administration:

1. IV continuous infusion:
    a. Solution is prepared and supplied by OSF pharmacy.
    b. Solution must be protected from light.
    c. Initial infusion rate at 0.3 **mcg**/kg/min.
    d. Titrate by 0.3 **mcg**/kg/min every 5 min until desired BP is achieved.
    e. Do not exceed 10 **mcg**/kg/min.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Reduce infusion rate and call Medical Control if excessive hypotension.
4. Call Medical Control if an adverse reaction is suspected.

Norepinephrine (Levophed)

Indications: Norepinephrine is primarily an alpha (some beta) agonist indicated for supporting blood pressure in acute hypotension, hypotension in post cardiac arrest, and hypotension in septic shock. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy (sulfite).
2. Hypotension due to hypovolemia unless adequate volume resuscitation is complete.
3. In critical circumstances infusion may be initiated in conjunction with volume resuscitation.
4. Avoid concomitant administration with *etomidate*, *ketamine* and *propofol*.

Adverse Effects:

1. Extravasation may result in tissue necrosis. Infusion should be given into a large vein (antecubital) or by central line.
2. Hypertension.
3. Severe peripheral and visceral vasoconstriction. Tissue hypoxia, and lactic acidosis may occur.
4. Pregnancy Category C. Use in life threatening situations.

Administration:

1. IV continuous infusion via infusion pump:
    a. Solution is prepared and supplied by the OSF hospital pharmacy. (8 mg in 250 ml of O.9% saline or D5W for concentration of 32 **mcg**/ml.)
    b. Incompatible with sodium bicarbonate in the same line.
    c. Initial infusion rate is 2-4 **mcg**/min.
    d. Titrate by 2-4 **mcg**/min every 2-5 minutes to maintain MAP >65 or SBP >90.
    e. Obtain BP every 2 minutes until desired BP is achieved, then every 5 minutes during infusion.
    f. If significant hypertension occurs, decrease by 2-4 **mcg**/min every 10 minutes.
    g. Do not discontinue abruptly (except if extravasation).
    h. Maximum dose id 30 **mcg**/min.

Norepinephrine

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Stop infusion if extravasation occurs.
4. Call physician if hypertension, tachycardia, extravasation, or any unexpected change in patient condition.

MCA: Delta
MCA Board Approval Date: 8/23/23
MDHHS Approval Date: 3/22/24
MCA Implementation Date: 3/22/24

Octreotide (Sandostatin)

Indications: Octreotide may be used for temporizing treatment of upper GI bleeding from esophageal varices. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.
2. Use caution in patients with cardiovascular disease or heart failure.
3. Use with caution in patients taking beta-blockers.
4. Use caution in patients with hepatic or renal impairment.

Adverse Effects:

1. Bradycardia and dysrhythmia.
2. High degree AV blocks.
3. QT prolongation.
4. Hypoglycemia.

Administration:

1. Initial bolus of 50 **mcg**.
    a. May repeat bolus in the first hr if bleeding not controlled.
2. IV continuous infusion:
    a. 25 to 50 **mcg**/hr.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Hold dose if.

Oxytocin (Pitocin)

Indications: Oxytocin is a naturally occurring hormone. Although oxytocin is used for the induction of labor, this protocol addresses the use of oxytocin in post-partum hemorrhage. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.

Adverse Effects:

1. Bradycardia, tachycardia, premature ventricular complexes & other arrhythmias.
2. Decreases in maternal systolic & diastolic blood pressure.
3. Strong (hypertonic)and/or prolonged (tetanic) contractions.

Administration:

1. 10 unit IM or IV may be given following delivery of placenta.
2. IV continuous infusion:
    a. Solution is prepared and supplied by OSF pharmacy.
    b. Infusion initiated at 30 milliunits/min.
    c. Titrate as needed to maintain uterine tone.
    d. Maximum rate is 1 unit/min.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Hold dose if hypertonic or tetanic contractions and call Medical Control.

Paralytics

Indications: This protocol considers the use of paralytics in the management of the ventilated patient. RSI is not within the scope of practice of the Paramedic and is not considered. Paralytics are divided into depolarizing and nondepolarizing agents. Depolarizing agents (succinylcholine) are often used in RSI but are inappropriate for continuous dosing. Nondepolarizing agents may be employed for maintenance of paralysis. Adequate control of the airway and ventilation is mandatory during paralysis. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.
2. Neuromuscular disease.

Adverse Effects:

1. Hypersensitivity to include anaphylaxis.
2. Respiratory arrest (expected).
3. Histamine release, with vasodilation and transient bronchospasm.
4. Hypotension.
5. Malignant hyperthermia.
6. Prolonged recovery from paralysis.

Administration:

1. Dosing should be based on ideal body weight.
2. **Rocuronium** (Zemuron):
    a. Single dose duration: 30 min (0.6 mg/kg); 67 min (1.2 mg/kg).
    b. 0.6 to 1.2 mg/kg for induction of paralysis.
    c. 5 to 17 **mcg**/kg/min for maintenance of paralysis.
3. **Vecuronium** (Norcuron):
    a. Single dose duration: 20-35 min.
    b. 0.8 to 1 mg/kg for induction of paralysis.
    c. 0.25 to 1.7 mcg/kg/min for maintenance of paralysis.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transports.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Obtain sedation endpoint from sending facility prior to departure.
4. **Ensure adequate analgesia and sedation before administration or increasing the dose of paralytics.**
5. Hold dose if signs of hypersensitivity, hypotension or suspected hyperthermia and contact Medical Control.

Potassium Chloride

Indications: Potassium chloride is a mineral salt electrolyte used in the treatment and prevention of hypokalemia. Intravenous replacement is generally reserved for the treatment of severe hypokalemia. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Contraindications:

1. Hypersensitivity.
2. Hyperkalemia.
3. Renal failure.
4. Addison's Disease (untreated).

Adverse Effects:

1. Hyperkalemia with cardiac dysrhythmia and cardiac arrest.
2. Fluid overload.

Administration:

1. Intermittent dosing is not appropriate for interfacility transport.
2. IV continuous infusion:
    a. Typically reserved for severe (<2.5 mEq/L)or symptomatic hypokalemia.
    b. Solution is prepared and supplied by the OSF pharmacy.
    c. Maximum concentration is 40 mEq/L.
    d. 10 to 40 mEq/hr – rate as ordered.
    e. Continuous ECG monitoring.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Hold dose if ECG changes indicating hyperkalemia and call Medical Control.
    i. Peaked T waves.
    ii. Prolonged P-R interval.
    iii. Widening or dropped P wave.
    iv. Widened QRS complex.
    v. Heart block.

MCA: Delta
MCA Board Approval Date: 8/23/23
MDHHS Approval Date: 3/22/24
MCA Implementation Date: 3/22/24

Propofol

Indications: Rapid Sequence Induction and Intubation, and post intubation sedation in the ICU. The transferring physician may elect to continue propofol sedation for the interfacility transfer of the adult intubated mechanically ventilated patient. Infusions are initiated by the sending facility and may be continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known hypersensitivity to propofol.
2. Allergy to eggs, egg products, soybeans or soy products.

Adverse Effects:

1. Hypotension.
2. Bradycardia.
3. Depression of cardiac output.
4. Oxyhemoglobin desaturation, apnea, and airway obstruction.
5. Propofol Infusion Syndrome

General:

1. Propofol does NOT provide analgesia. Patients may require the addition of an analgesic for appropriate management.
2. Propofol produces amnesia, dependent on dose.
3. Patients must be closely monitored for hypotension and cardiovascular depression.
4. Patients with compromised myocardial function, intravascular volume depletion, or abnormally low vascular tone (e.g., sepsis) may be more susceptible to hypotension.
5. There is interpatient variability in dosage requirements, and these requirements may change with time.

Administration:

1. IV continuous infusion:
    a. Propofol is supplied as a standard premixed infusion of 10 mg/ml.
    b. Initiation of sedation should begin at 5 **mcg**/kg/min.
    c. Increased by increments of 5 **mcg**/kg/min to 10 **mcg**/kg/min until the desired level of sedation is achieved.
    d. Most adult patients require maintenance rates of 5 **mcg**/kg/min to 50 **mcg**/kg/min or higher.
    e. A minimum period of 5 minutes between dose adjustments should be allowed for onset of peak drug effect.
    f. Administration should not exceed 66 **mcg**/kg/min.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Follow Inter-facility **Patient Sedation Protocol**.
3. Obtain starting dose and titration parameters from sending facility physician prior to departure.
4. Ensure adequate sedation prior to departure. Refer to Inter-facility **Patient Sedation Protocol**.
5. Obtain sedation endpoint from sending facility prior to departure.
6. Hold dose if:
    a. New onset or worsening hypotension.
    b. Refractory bradycardia.
    c. Contact Medical Control in all instances.

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Thrombolytics

Indications: Thrombolytics are proteases that convert plasminogen to plasmin. Plasmin lyses clots by breaking down the fibrinogen and fibrin contained in a clot. Primary indications include; acute myocardial infarction (AMI), acute ischemic stroke (AIS), pulmonary embolism (PE), deep vein thrombosis (DVT), acute peripheral arterial occlusion, and occlusion of indwelling catheters. When administered by continuous infusion, the infusion is initiated by the sending facility and continued by the Paramedic. This Protocol is for Paramedic use only.

Thrombolytic agents (used at OSF-St Francis):

1. Tissue plasminogen activator (tPA) - Alteplase
2. Recombinant plasminogen activator (r-PA) – Retaplase
3. Tenecteplase (TNK) – TNKase

Contraindications:

1. Known allergy.
2. Current or prior intracranial hemorrhage.
3. Subarachnoid hemorrhage suspected.
4. Active internal bleeding.
5. Stroke within 3 months.
6. Intracranial or intraspinal surgery or serious head trauma within 3 months.
7. Intracranial pathology with risk of bleeding (neoplasm, AVM, aneurysm).
8. Bleeding diathesis.
9. Current severe uncontrolled hypertension.
10. Aortic dissection suspected.
11. Pregnancy Category C – use if benefit outweighs risk.

Adverse Effects Include:

1. Hemorrhage.
2. Stroke.
3. Reperfusion dysrhythmias.
4. Embolism.

Administration:

1. Solution is prepared and supplied by OSF pharmacy.
2. **Tenecteplase** push dose in **Acute Myocardial Infarction**:
   30-50 mg IV bolus over 5 sec once (based on weight)
   a. <60 kg: 30 mg
   b. 60-70 kg: 35 mg
   c. 70-80 kg: 40 mg
   d. 80-90 kg: 45 mg
   e. >90 kg: 50 mg

3. **Alteplase** accelerated infusion (90 min) in **Acute Myocardial Infarction**:
    a. ≤ 67 kg.
        i. 15 mg bolus over 1- 2 min then,
        ii. 0.75 mg/kg over 30 min (not to exceed 50 mg),
        iii. 0.5 mg/kg over 60 min (not to exceed 35 mg).
    b. > 67 kg.
        i. 15 mg bolus over 1-2 min then,
        ii. 50 mg over 30 min then,
        iii. 35 mg over 60 min.
4. **Alteplase** in **Pulmonary Embolism**:
    a. 100 mg infusion over 2 hr.
5. **Alteplase** in **Acute Ischemic Stroke**:
    a. 0.9 mg/kg (not to exceed 90 mg total dose).
        i. 10% of total dose as bolus over 1 min then,
        ii. remainder of dose infused over 60 min.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Call Medical Control if active internal or intracranial bleeding suspected.

Valproate sodium (Depacon)

Indications: Valproate is indicated for the control of complex and partial seizures. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.
2. Pregnancy.
3. Liver failure.
4. Avoid in acute head trauma.

Adverse Effects:

1. CNS depression, somnolence, ataxia, dizziness, double vision, tremor, headache.
2. Nausea, vomiting.
3. Hepatic toxicity.

Administration:

1. IV infusion:
    a. Solution is prepared and supplied by the OSF pharmacy.
    b. 10 to15 mg/kg/day divided q12 hr infused over 1 hr.
    c. Single infusion dose is 5 to 7.5 mg/kg over 1 hr.
    d. Maximum dose 60 mg/kg/day.

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Hold dose and call Medical Control if signs of allergic reaction.

MCA: Delta
MCA Board Approval Date: 8/23/23
MDHHS Approval Date: 3/22/24
MCA Implementation Date: 3/22/24

Date: August 2023 Section 11-38

Vasopressin (Anti-Diuretic Hormone)

Indications: Vasopressin is a hormone analog used to increase blood pressure in adults with vasodilatory shock (septic shock) who remain hypotensive despite fluids and catecholamines. Infusions are initiated by the sending facility and continued by the Paramedic. This Protocol is for EPIC Paramedic use only.

Contraindications:

1. Known allergy.
2. Pregnancy Category C. Use with caution only if benefit outweigh risk.

Adverse Effects:

1. Use caution in patients with seizure, migraine, asthma, heart failure, vascular disease, angina pectoris, coronary thrombosis, renal disease.
2. Therapy may produce tonic uterine contractions that could threaten continuation of pregnancy.
3. Use with catecholamines is expected to result in an additive effect on mean arterial blood pressure and other hemodynamic parameters

Administration:

1. IV continuous infusion:
    a. Administration only via controlled infusion device.
    b. Solution is prepared and supplied by OSF Pharmacy.
    c. Confirm concentration of 40 unit/100 ml (0.4 unit/ml).
    d. Dose range 0.01 unit/min to 0.06 unit/min.
    e. Titrate 0.005 unit/min every 10 – 15 minutes until target BP is reached.
    f. Maximum dose is 0.06 unit/min (data for rates greater than 0.07 unit/min are limited and adverse effects common).

Inter-facility Transfer Directives:

1. Follow general protocols for inter-facility transport.
2. Obtain starting dose and titration parameters from sending facility physician prior to departure.
3. Contact Medical Control if an adverse reaction is suspected (see adverse reaction section above).