Medication Administration

Information:

EMS providers preparing to administer medications in the out of hospital setting should review and/or recite the "6 Rights" prior to administering any medication to a patient. While all 6 elements are important, In the out of hospital setting, special attention should be paid to the right medication, right dose, and right route - as these are frequently the areas of error in the EMS environment. In addition, EMS providers should ensure the patient is informed as to what medications they are receiving and afford an opportunity for the patient to refuse. Lastly, documentation is essential so that medications administered in the out of hospital setting become part of the patient's clinical medical record. By following the "6 Rights" of medication administration, EMS providers will significantly decrease the potential and number of errors associated with medication administration.

Definitions:

I. Medication: Any pharmacological intervention used to treat, prevent, or reduce signs and symptoms of diseases, disorders, and/or traumatic injuries.

II. Medication administration routes include the following: Intramuscular, Intravenous, Intraosseous, Oral, Buccal, Rectal, Inhaled, and Subcutaneous.

Procedure:

I. Prior to the administration of any medication ensure the following are reviewed and/or verbalized by at least two providers – if available (checked, and double checked):
   A. 6 Rights of Medication Administration –
      1. Right Patient
      2. Right Dose
      3. Right Medication (including indication)
      4. Right Route
      5. Right Time
      6. Right Documentation (including response)

II. Calculating medications when given a dosage range and a per kg dose:
   A. Calculate weight in kilos and multiply by the prescribed dosage (e.g. - mg/kg)
   B. The resultant dose should be less than the maximum single dose.
      1. In adults, for ease of administration, doses may be rounded to the nearest whole number within the range for those calculated doses at or above 1 dosage unit, or to the nearest tenth for those below 1 dosage unit (examples: 1.2 mg rounded to 1 mg, and 0.26mg rounded to 0.3mg). That calculated and rounded dose may be given and repeated in timed intervals, as indicated for that medication, to the control of symptoms or maximum stated cumulative dose if symptom control is not previously achieved.
      2. For pediatric patients, utilize MI-MEDIC and a length-based tape for all medication calculations.

C. Pediatric patients will never be given a single or total dose that exceeds the maximum single or total adult dose.

III. Following administration of any medication
   A. Document all pertinent aspects of the medication administration including but not limited to medication name, dose, route, and time in an electronic patient care report.
   B. Obtain signature of prescriber (medical control physician or other qualified designee) per local medical control authority policy.

Intranasal Medication Administration:

Intranasal medication administration using an FDA approved and MCA authorized atomizing device as specified in applicable patient care protocols may be allowed for MFR per MCA selection.

MCA Approval for intranasal medication administration for MFR
(●) Yes
( ) No

MCAs will be responsible for maintaining a roster MFR of the BLS agencies choosing to participate and will submit roster to MDHHS

Procedure:

1. Select desired medication and determine dose per applicable protocol.).
2. Draw up appropriate dose (volume) of medication plus an additional 0.1 mL to account for device dead space.
3. Attach atomizing device to syringe.
4. Use one hand to support back of patient's head as needed.
5. Place tip of atomizing device snuggly against nostril aiming slightly upward and outward. Administration angle should be approximately 45°.
6. Rapidly administer one half of the dose of medication, briskly pushing plunger.
7. Repeat with other nostril delivering the remaining volume of medication.
8. Use the highest concentration available for the medication.
9. Note: Maximal dose per nostril is 1 mL

Nebulized Medication Administration

Nebulized medication administration using an FDA approved and MCA authorized atomizing device as specified in applicable patient care protocols may be allowed for EMT per MCA selection.

MCA Approval for nebulized medication administration by EMT

(●) Yes
( ) No

MCAs will be responsible for maintaining a roster MFR of the BLS agencies choosing to participate and will submit roster to MDHHS

Procedure:

1. Obtain vital signs and auscultate lung sounds.
2. Select desired medication and determine dose per applicable protocol.).
3. Place the appropriate volume of medication in the lower half of the nebulizer unit. Then screw the upper half of the unit in place.
4. Attach the nebulizer to the base of the T piece. Then attach the mouthpiece to the T piece or connect neb chamber to NRB mask.
5. Attach one end of the oxygen tubing to the base of the nebulizer and the other end of the oxygen tubing to the oxygen source.
6. Set the **oxygen** liter flow at 6 L/min.
7. Instruct the patient to breathe normally through the mouthpiece, taking a deep inspiration every 4 or 5 breaths.
8. Continue the treatment until all the medication has been delivered through the nebulizer. You may need to gently tap the reservoir once or twice during the treatment to re-disperse the medication.
9. Obtain and record another complete set of vital signs and lung sounds after completion of the treatment.

Pediatric Considerations

1. Infants and small children may not be able to use adult mouthpiece and may need to use blow-by or pediatric mask

NOTES:
MCL 333.17754 Section 1(C)) An electronic signature or other identifier that specifically identifies and authenticates the prescriber or his or her agent.

Medication Substitution

Purpose:

This protocol allows for MCA to substitute medications during a time of shortage without having to enact emergency protocols within the MCA. This protocol does not replace or override any portion of the **Medication Shortage Procedure**. All procedures within that procedure must still be followed in regards to substitutions in concentration or medication.

Indications:

None of the medication options indicated in the MCA approved protocol are available.

Procedure:

1. Follow **Medication Shortage Procedure.**
2. Alternate concentrations are listed within this protocol for reference; these do not require a protocol change and are outlined in the **Medication Shortage Procedure.**
3. Notification and education of providers within the MCA should be done as soon as the substitution is known.
    a. It is the responsibility of the MCA to distribute information on the shortages and substitutions to agencies for distribution to providers.
    b. If a substitution is imminent, it is acceptable for an MCA to distribute information prior to the medication being substituted.
4. The MCA should notify the Division of EMS and Trauma if a substitution is suspected to last more than 60 days so that a more permanent protocol solution can be enacted.
5. All uses of substitute medications will be reviewed by PSRO for appropriateness.

Current Medication	Substitution
Amiodarone	Procainamide
Calcium Chloride	Calcium Gluconate
Diazepam	Lorazepam
Diphenhydramine	Famotidine Ranitidine Hydroxyzine
Fentanyl	Hydromorphone
Lidocaine	Procainamide
Midazolam	Lorazepam
Morphine	Hydromorphone
Ondansetron	Promethazine Compazine

Medication Shortage

A. Definitions:

1. ***Alternate Concentration*** – same medication, different concentration, while volume may change, the delivered dose remains unchanged, dilution may be required (*Epinephrine 1: 10,000 replaced using Epi 1: 1,000 with a 10mL diluent)*
2. ***Alternate Supplied Volume –*** same medication, same concentration, standard volume is unavailable, the delivered dose and volume remain the same *(Epi 1: 1,000, typically supplied in a 1mL vial replaced with Epi 1: 1,000 in a 10mL multi-dose vial due to shortage of the smaller vials)*
3. ***Alternate Supply/Type –*** same medication, standard supply type is unavailable (preloads vs. vials), dosing remains unchanged *(diphenhydramine 50mg/5mL preload is unavailable, replaced with diphenhydramine 50mg/5mL in a vial)*
4. ***Alternate Form*** – same medication, different route such that identical dosing does not yield the same systemic concentration or effect *(ondansetron 4mg vial unavailable, replaced with ondansetron 4mg ODT, option to repeat x 1 added to allow approximation of equivalent dosing)*
5. ***Alternate Medications*** – medication other than the standard approved medication which accomplishes an acceptably similar effect as the medication it replaces *(fentanyl 100mcg approved to replace morphine 10mg, dosing adjusted to obtain therapeutic equivalency)*
6. ***Missing Medication*** – standard medication which is unavailable *(amyl nitrite not available, acceptable alternative of Cyanokit is excessive in cost and size: alternate means to access treatment established – MEDDRUN)*
7. ***Outsourced medications – Repackaged by a 340B or 503 B medications in the same concentration and volume that have at least a 90 day expiration date.***

B. Criteria:

1. Participating pharmacies be it at the individual MCA or at a wider regional level, shall establish and maintain a listing of the standard medications and supplies contained in drug bags or boxes supplied to life support agencies for the purposes of treating patients.
2. Each participating pharmacy shall maintain a dated listing of alternative medications which are approved as substitutes or replacements for medications which are in shortage.
3. Due to the frequency of medication shortages and the need for alternative dosing or medication substitutions, each MCA shall develop and enact a medication cross-check procedure, to which EMS personnel will be held accountable as a means to avoid medication errors
4. Both the standard list and the alternate list (may be combined into a single document) shall be made readily available to system participants
5. The participating pharmacy shall enact policies/procedures which guide each of the following:
   A. Recognition of medication shortages and a means to report them

B. Pharmacy involvement in the investigation and designation of acceptable alternatives when shortages are identified
C. An organized process by which participant pharmacies will enact the replacement or substitution
D. A documented means of visually identifying when an alternative medication or dosing has been placed into an EMS drug bag or box, or when a medication is missing
    a. ***Alternate medications*** will be indicated by the placement of a sticker, tag or label on the outside of the bag or box; on the compartment where the alternate medication is located (if applicable) such that one inspecting the bag or box could easily recognize that the medication was included and what the missing medication it is intended to replace was. (Stickers GREEN or WHITE with GREEN)
    b. ***Missing medications*** will be signified by the placement of a sticker, tag or label on the outside of the bag or box, on the compartment where the missing medication would be located (if applicable) such that one inspecting the bag or box could easily recognize that the medication was missing and what the potential alternate medication was. (Stickers YELLOW or WHITE with YELLOW)
E. A method for dissemination of information related to changes made to the participating pharmacy drug bags or boxes with a means of accounting for receipt of the notifications at the agency/pharmacy levels

C. Selection of Alternative Medications:

1. Alternative concentrations, alternative supply/type and alternative supplied volume may be approved at the MCA/participating pharmacy level without a change to protocol provided that the standard and approved alternate medications are documented in the required lists, by effective date or date range.
2. Alternate form and alternate medications may be enacted as an emergency protocol according to statute and state approval, in the event of imminent shortage.
3. Non-standard medications, or those with no precedence of EMS use within Michigan must be submitted as new protocol submissions. The state may allow for expedited review in the event of imminent shortage of the medication being replaced.
4. If a missing medication will not be replaced, or an acceptable alternative is not found, a protocol or process should be developed or presented which addresses the potential inability to meet the existing protocol established standard of care.

D. Process:

1. A brightly colored ALTERNATE DOSE sticker/tag MUST be attached to the outside of the drug bag, box or narcotics box that lists the effected medication, the concentration of the substituted medication, the expiration date of the medication and the pharmacy name/date.
2. A brightly colored – MISSING MEDICATION sticker/tag must be placed on bags/boxes when a protocol medication is not available to stock in that bag/box.

3. A dosing/instruction card may be required to be included in the bag/box depending on the change.
4. Pharmacies experiencing shortages must provide notification of the need to utilize alternate dosing to the MCA , and receive MCA approval, prior to any change being implemented.
5. Drug bags, boxes or narcotics boxes with alternate dose medications/missing medications should have the medication replaced and the sticker/tag removed by pharmacy as soon as possible when the proper medication or concentration of medication is available.
6. Any additional equipment, which is needed to deliver the medication, must be included with the alternate dose.
7. EMS Agencies receiving notice of the utilization of alternate dosing, alternate medications or missing medications due to shortage must post the changes and ensure that all providers that may have cause to use the medications are made aware of the changes and are educated on proper use, risk and dosing of any new or replacement medication prior to their first potential exposure to the alternate dose or medication.
8. Any Special Instruction for a particular shortage will be communicated to all effected pharmacies and EMS services.

Personal Metered Dose Inhaler Use (MCA Optional Protocol)

☑ Medical Control Authorities choosing to adopt this supplement may do so by selecting this check box. Adopting this supplement changes or clarifies the referenced protocol or procedure in some way. This supplement supersedes, clarifies, or has authority over the referenced protocol.

Purpose: Nebulized respiratory treatments are preferred over MDI's. This protocol is to allow for the use of the patient's own prescribed Metered Dose Inhaler (MDI) containing only albuterol, in place of nebulized albuterol administration by EMS personnel. This is to be used only in patients with **febrile respiratory symptoms**

A. To substitute administration of **albuterol 2.5 mg/3ml NS** nebulized with use of the patient's own prescribed MDI the following criteria MUST be met.
   1. A specific and applicable treatment protocol is being followed
   2. EMS provider administering patient prescribed MDI is MCA authorized to administer **albuterol 2.5 mg/3ml NS** nebulized within the treatment protocol

B. Indications
   1. Patients with febrile respiratory symptoms in need of bronchodilator treatment

C. Requirements
   1. Patient has a prescribed rescue Metered Dosed Inhaler (MDI) containing albuterol only
   2. MDI is prescribed to the patient (no one else)
   3. Medication is not expired
   3. MDI has a functioning spacer (preferred not required)

D. Procedure
   1. Assist patient in receiving four (4) puffs of their own rescue Albuterol Metered Dose Inhaler (MDI), with spacer, in place of each nebulized treatment of **albuterol 2.5 mg/3ml NS** as indicated in applicable treatment protocol.
   2. Use of a spacer is optimal. When no spacer is available, ensure that that patient breathes out completely before each puff in order to inhale as much medication as is possible.
   3. Do not use an MDI prescribed to another person.
   4. All MDI's should be brought to the hospital with the patient, if transported.

E. Directions for use an MDI with spacer (Figure 1)

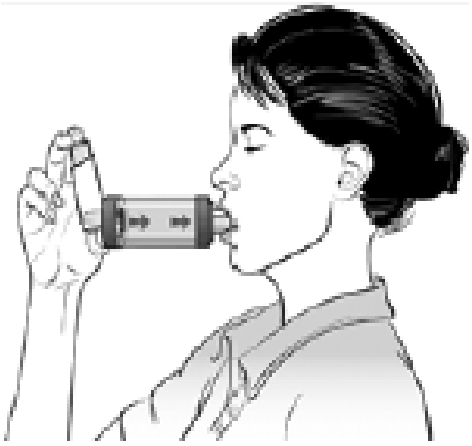


Figure 1

1. Remove the cap from the MDI and spacer. Shake well
2. Insert the MDI into the open end of the spacer (opposite the mouthpiece).
3. Place the mouthpiece of the spacer between the patient's teeth and have them seal their lips tightly around it.
4. Have the patient breathe out completely
5. Press the MDI canister once.
6. Have the patient breathe in slowly and completely through their mouth. If you hear a "horn-like" sound, they are breathing too quickly and need to slow down.
7. Have the patient hold their breath for 10 seconds (count to 10 slowly) to allow the medication to reach the airway of the lung.
8. Repeat the above steps for each puff.
9. Replace the cap on your MDI when finished.

EMS: Medication and IV Supply Requirements

I. Emergency medical service vehicles will be equipped with medication boxes and IV kits or supplies consistent with their licensure level and protocols.

II. The contents of the medication boxes are subject to inspection at any time by participating hospital pharmacy staff or by the medical control authority.

III. Medication boxes will be prepared by MCA participating hospital pharmacies prior to each patient use see **Pharmacy: Medication and IV Supply Requirements Protocol**.

- A. All medications will be obtained from an MCA participating pharmacy.
  - i. Oral glucose is the only medication that an agency may own and supply.
  - ii. Agencies must have an MCA approved process in place for manufacture recalls.

IV. IV kits may be prepared and sealed by MCA participating pharmacies or by delegated agencies per MCA approved procedure.

V. Licensed EMS personnel will assure that a proper seal is in place on medication boxes

VI. The ambulance agency and licensed EMS personnel are responsible for the security of the medications and supplies.

VII. Medication boxes and IV supplies shall be locked and secured in the EMS vehicle, except when required for patient care. Each agency will have a MCA approved procedure in place to ensure controlled access to the medication boxes and IV supplies.

VIII. Licensed EMS personnel will include the following MCA approved documentation when returning medication boxes (and IV supplies if applicable) to a secure location for pharmacy exchange.

- A. All medications used and/or wasted from the medication box (and IV supplies if applicable)
- B. Physician, PA or NP signature for controlled substances administered.
- C. Witness signature for controlled substance waste
  - i. Whenever controlled substances are used from a medication box, any unused or contaminated medication must be wasted in the presence of a witness that is a licensed healthcare professional that is authorized by the receiving facility to sign for wasted controlled substances.
- D. MCAs will determine procedures and requirements for EPCR signatures

IX. Opened syringes, needles, and any broken glass ampules will be properly disposed of and not left in the medication box. It is the responsibility of the licensed EMS personnel to clean any blood or body fluids from the inside of the medication box before it is returned to the pharmacy.

X. If EMS personnel or agency discover a discrepancy in medication box contents, they shall contact the last pharmacy which had possession of the box and mutually resolve the discrepancy.

A. Upon resolution, the agency shall submit a report to the medical control authority documenting the circumstances and the resolution. A copy of the report will also be sent to the pharmacy by the agency.

B. Discrepancies that cannot be resolved between the pharmacy and agency will immediately be forwarded to the medical control authority for investigation.

Pharmacy and MCA: Medication and IV Supply Requirements

Roles

1. Pharmacies operated within the member hospitals, member Free Standing Emergency Departments, and member outpatient surgical centers of the medical control authority and participate in the medication exchange system established by this protocol are considered MCA participating pharmacies and shall be referred to as 'pharmacies' for this protocol.
2. The MCA participating pharmacy is responsible for ensuring that re-stocked EMS medication boxes (and if applicable, IV supplies) are available to EMS units 24/7 who bring a box for replacement. The Administrative Rules of the Michigan Board of Pharmacy (R 338.486)(4)(c) require that "The pharmacist shall routinely inspect these medications and, after use, shall verify the contents and replace the medications as necessary".
3. The Director of Pharmacy at each MCA participating pharmacy is responsible for assuring compliance with this protocol.

Responsibilities

1. Medication box refers to the boxes and additional packs (if MCA approved) that contain medications required to fulfill the care outlined in the MCA approved protocols.
    a. All medications in approved protocols must be supplied in correct dosages, concentrations, and quantities to fulfill the MCA approved protocols.
    b. All medications carried must have a corresponding protocol for use.
    c. Medication boxes must be provided per licensure level, containing only medications that are MCA approved for that licensure level to administer
2. Medication box contents remain the property of the MCA participating pharmacy. The MCA participating pharmacy will manage their respective inventory for restocking medication boxes (and if applicable, IV supplies).
    a. Unless addressed by approved protocol, all medications (including over the counter medications) must be obtained from an MCA recognized participating pharmacy.
    b. Oral Glucose is the only medication an agency may own and supply
3. The medication box itself is owned by the entity that purchased it and entered it into the system (i.e., EMS agency, MCA, hospital, etc.).
4. The medical control authority will maintain a list of the medication box numbers currently "in service", and will assign new medication box numbers, as needed.
5. The pharmacy will Include in each box an MCA approved document(s) that state the inventory of the box, allow for usage and waste documentation, and required signatures (narcotic administration, narcotic waste).
6. IV kits may be prepared and sealed by MCA participating pharmacies or by delegated agencies per MCA approved procedure.
7. The pharmacy will upon issuing or refilling a box assure the following are in place:

a. Label/Relabel the medication box/pack with a pharmacy label which contain, at minimum.
    i. The hospital name
    ii. The name or initials of the pharmacist checking the box
    iii. The date the box was restocked and checked.
    iv. The expiration date of the first medication to expire in the box (this date must be at least three months from the date the box is being restocked and checked).
    v. The tag number of the locks assigned to the box.
b. Attach to the exterior of the box a notification regarding any changes to contents of the medication box that deviates from the standard inventory list of contents.
c. Assure the box is sealed and secured.

8. The contents of the medication box are subject to inspection at any time by the medical control authority and/or pharmacy.
9. A current schematic or inventory list of the medication box (including concentrations and quantities) shall be submitted to the MCA by the pharmacy.

    The MCA is responsible for assuring that MDHHS has a current schematic or inventory list.

10. The pharmacy will be responsible for establishing requirements for EMS units to obtain or replace IV supplies (if applicable).
11. The pharmacy is responsible for providing a 24/7 accessible, secure environment for obtaining restocked medication boxes (and IV supplies if applicable) and returning of used medication boxes unless otherwise established by the MCA.
12. Upon receiving a used medication box from an EMS service, the pharmacy will:
    a. Check to assure that the box is properly sealed and contains documentation that includes:
        i. All medications used and/or wasted from the medication box (and IV supplies if applicable).
        ii. Physician, PA or NP signature for controlled substances administered.
        iii. Witness signature for controlled substance wasted
    b. Replace the used contents of the medication box (including IV supplies if applicable) and verify that all supplies and medications listed on the medical control authority medication box inventory form are present.
13. If a discrepancy is found by the pharmacy, the pharmacy shall contact the agency with last possession of the medication box/pack and mutually resolve the discrepancy.
    a. Upon resolution, the pharmacy shall submit a report to the medical control authority documenting the circumstances and resolution. A copy of the report will also be sent to the agency by the pharmacy.
    b. Discrepancies that cannot be resolved between the pharmacy and agency will immediately be forwarded by the pharmacy to the medical control authority for investigation

Region 5 Medical Control Authority Network Protocol
R5MCAN EMS Medication Replacement and Exchange Procedure

Initial Date: 4/19/18
Revision Date: October 31, 2023

9.6(S)

DEFINITIONS:

- R5MCAN: Region 5 Medical Control Authority Network
- EMS: Emergency Medical Service
- LOCAL: EMS agencies and hospitals that commonly work together as defined in appendix 7
- MCA: Medical Control Authority
- ALS: Advanced Life Support
- ADM: Automated Dispensing Machine (e.g. Pyxis® or Omnicell®)
- EMS Provider: An emergency medical technician (EMT) or paramedic
- Paramedic: An advanced provider of pre-hospital emergency medical care with formal training that includes, but is not limited to, human physiology, pharmacology and medication administration techniques.

LEGAL AUTHORITY:

This procedure has been developed in accordance with the State of Michigan EMS Protocols and, where delegated tasks and responsibilities are concerned, with section 333.16215 of the Michigan Public Health Code and R 338.490(5) of the Pharmacy – General Rules adopted by the Michigan Board of Pharmacy.

PURPOSE:

The R5MCAN EMS medication bag and controlled substance box regional exchange program is designed to improve the efficiency of the pre-hospital care system through the standardization of the EMS formulary of medications (type, quantity, and concentrations), simplification of the restocking procedures for perishable supplies, and the reduction of EMS personnel and pharmacy management time through the ability to re-stock at various transport destinations throughout Region 5. This procedure outlines the **participation, responsibilities, exchange procedures, accountability, and oversight** processes for the Region 5 EMS medication bags and controlled substance boxes. The procedure also provides guidance to ensure that the pharmacies receive all appropriate paperwork, thereby remaining compliant with applicable rules, regulations, policies and laws. All activities undertaken through the implementation of this procedure are to promote and ensure the universal ability for Region 5 EMS agencies to restock/exchange EMS medications at any participating hospital in the region. Despite procedural variance among the region's hospitals, a mechanism will be in place to allow for timely medication bag/box exchange for Region 5 EMS agencies including those not serving as primary EMS affiliates to hospitals.

PARTICIPATION:

1. This procedure applies to all hospital pharmacies, EMS agencies and MCAs participating in Region 5 as members of the Region 5 Medical Control Authority Network (R5MCAN).
2. Selection of the R5MCAN EMS Medication Bag and Controlled Substance Box Regional Exchange Program as a pick option in the MCA agreement will signify adoption of this procedure and will allow an MCA and its corresponding EMS agencies/pharmacies to enter into the medication bag exchange system.
3. Each participating EMS agency should have a replenishment agreement with the hospital(s) it plans to exchange with. See Appendix 2 for a sample agreement.
4. Each participating MCA must have a minimum of one identified representative and one alternate to serve on the R5MCAN EMS Medication Bag Oversight Committee. Each MCA is encouraged to have an EMS and a pharmacy representative on the Oversight Committee.
5. The R5MCAN EMS Medication Bag Oversight Committee will meet on a regularly scheduled basis to review incident reports / concerns, follow up on inquiries, evaluate system performance and evaluate process improvement opportunities.
6. A regional formulary, based on the State of Michigan EMS Protocols, will be used to stock the bags/boxes in a uniform configuration to ensure interoperability between Region 5 pharmacies and EMS agencies. See Appendix 3 for contents lists, including pictures, for R5MCAN medication bags and controlled substance boxes.

7. MCA's electing to participate in the R5MCAN EMS medication bag and controlled substance exchange program are required to approve this system protocol by checking the appropriate MCA box below and submitting the adopted protocol for approval with a formal effective date to the MDHHS along with a medical director signature on the corresponding physician signature page presented in appendix 12.

☒Allegan County MCA	☒Barry County MCA	☒Berrien County MCA
☒Branch County MCA	☒Calhoun County MCA	☒Cass County MCA
☒Kalamazoo County MCA	☒St. Joseph County MCA	
☒Van Buren County MCA		

RESPONSIBILITIES:

1. MCA Responsibilities:

A. Participating MCAs will promote a relationship with local hospital pharmacies and EMS agencies ensuring communication pathways are in place to optimize system performance and accountability with regard to medication use and exchange.
B. MCA physicians and staff agree to communicate changes in EMS medication bag/box formulary to system providers and pharmacists as changes are made by the R5MCAN EMS Medication Bag Oversight Committee.
C. In collaboration with local EMS agencies and local pharmacies the MCA will ensure a process is in place to allow for EMS agency medication exchange.
D. MCAs agreeing to participate in the EMS Medication Replacement and Exchange procedure must agree to enforce the provisions of this procedure.
E. Each medical director or his/her designee at each participating MCA is responsible for ensuring MCA compliance with this procedure.

2. Pharmacy Responsibilities:

A. Pharmacies will ensure a process is in place to restock and exchange EMS medication bags and controlled substance boxes.
B. Pharmacies will ensure that EMS medication bags and controlled substance boxes are stocked in compliance with the regional medication formulary.
C. Pharmacies will arrange for a secure environment for EMS medication bags and controlled substance boxes that are restocked and awaiting pickup or are used and have been dropped off for exchange.
D. In collaboration with local EMS agencies and the local MCA, pharmacies may elect to have a process is in place that delegates limited re-stock of common use items within the EMS medication bags to paramedics who have received appropriate, documented training. At a minimum, a process for "full-bag" exchanges with local and regional EMS agencies will be in place at each participating hospital.
E. Pharmacies may have a separate exchange process for local EMS agencies versus non-local regional EMS agencies.
    i. **Example:** A paramedic from a local EMS agency who has been granted access to the EMS Pyxis (or the designated, secured EMS restock cabinet) may perform limited paramedic re-stock when transporting to their local hospital(s). When transporting away from their local hospital(s) to another hospital in the region, the paramedic would do a full-bag (1 for 1) exchange.
F. Pharmacies are required to routinely inspect EMS medication bag and EMS controlled substance box contents in compliance with the administrative rules of the Michigan board of pharmacy (R 338.486(4)(c)) and replace medications as necessary.
    i. Pharmacies are responsible for verifying that all pharmacy-stocked supplies and medications listed on the regional medication and equipment formulary are present and in-date upon stocking/restocking. See Appendix 4 for a sample pharmacy EMS bag restocking sign-off form.
    ii. Whenever possible, medications that are 60 days or less away from

expiration will be rotated out of the medication bags and controlled substance boxes.

iii. After restocking, controlled substance boxes and the pharmacy-stocked compartments of the medication bags will be secured by pharmacy, utilizing numbered green tamper-resistant locks.

iv. In instances where the medication bag comes to pharmacy for restocking, pharmacy staff will *also* verify that all EMS agency stocked medications listed on the regional medication formulary are present and in-date. That pouch will then be sealed with a green lock with the item name and expiration date of the next item to expire in the compartment written on it.

v. Each EMS medication bag and controlled substance box shall have a label indicating the bag/box number, stocking hospital/pharmacy that filled it, fill date, next medication to expire, date of expiration, and the name or initials of the individuals that filled/checked it.

G. Medication bag and controlled substance box contents remain the property of the participating pharmacies.

H. The Pharmacist in charge at each participating hospital is responsible for assuring compliance with this procedure.

3. EMS Agency Responsibilities:

A. Paramedics are responsible for turning in used medication bags and/or controlled substance boxes in a serviceable condition free from trash, contaminated waste and any potential sharps. Unsecured sharps and biohazard materials left in / on bags may result in disciplinary action by the agency.

B. Paramedics will complete the appropriate documentation for medications/supplies used.

C. Paramedics will use the numbered red seal provided in the medication bag or controlled substance box to secure and tag a used/expired bag/box, alerting the pharmacy that attention to the bag/box is needed.

D. EMS agencies are responsible for cleaning bags that become soiled or contaminated. In the event that a bag needs to be decontaminated or cleaned, an EMS agency may contact its local hospital pharmacy to arrange for securement of medications and to sign out a temporary replacement bag for use during the cleaning process.

E. In collaboration with local pharmacies and their local MCA, EMS agencies will have the option to establish a process for limited paramedic re-stock of common use items within the EMS medication bags. At a minimum, a process for “full-bag” exchanges will be in place at participating region 5 hospitals.

F. EMS agencies, in collaboration with the R5MCAN EMS Medication Bag Oversight Committee, will ensure paramedics receive documented training in the procedure for limited paramedic restocking and appropriate alternatives in case of omission/error in restocking before being delegated the authority to perform limited paramedic restock.

G. EMS agencies will provide an end user agreement (Appendix 5) to the appropriate hospital pharmacy representative at each hospital granting access for each paramedic who will have access to an ADM or locked cabinet for the purpose of medication bag and controlled substance box exchange.

H. EMS agencies are responsible daily for ensuring that all medication bags and boxes in their possession are current, without expired medications, and have appropriate seals and labels in place. Expired medications will be exchanged with the local hospital pharmacy.

I. EMS agencies are accountable for the security of the bags / containers and the contents therein issued to their control by the participating pharmacies.

J. EMS agencies are responsible for maintaining a chain of custody for EMS controlled substance boxes, including a procedure for documenting a dual sign off at least every 24 hours using the R5MCAN EMS Agency Controlled Substances Box Log Sheet (see Appendix 6) or an acceptable equivalent that has been approved by the R5MCAN EMS medication bag oversight committee.

K. EMS agencies that do **not** have a one-to-one controlled substance box-to-truck assignment process will maintain a locked cabinet or safe in a fixed location. The cabinet will require TWO access means/keys and TWO State of Michigan Licensed EMS providers one of whom must be a paramedic to be present simultaneously for access.
L. All applicable sign in/out documents (agency/hospital) must be fully completed for both bags and controlled substance boxes being issued/returned.
M. The participating EMS agency director/manager or his/her designee is responsible for assuring compliance with this procedure.

Issuance of R5MCAN EMS Medication Bags and Controlled Substance Boxes

1. R5MCAN EMS medication bags will be uniquely numbered in a permanent fashion, both inside and outside, using the format 5D-YY-###. Controlled substance boxes will also be uniquely numbered in a permanent fashion using the format 5D-YY-###, and will be configured in such a way as to permit a visual inspection of the contents without opening the box.
2. Each medication bag and controlled substance box will have a restocking label prominently affixed to the outside of the bag/box, following the format below.

REGION 5 MEDICAL CONTROL AUTHORITY NETWORK
HOSPITAL NAME AND PHARMACY PHONE # PRE-PRINTED
FILL DATE: _____ TECH/RPH: _____
GREEN LOCK #: _____ RED LOCK #: _____
NEXT TO EXPIRE: _____ EXP DATE: _____
BAG/BOX #: _____

3. Refer to Appendix 3 for contents lists for R5MCAN medication bags and controlled substance boxes.
4. Any supplemental regional medication kits (such as the “TXA Kit”) must be individually labeled. Contents of these kits may be detailed in Appendix 3 or included as an additional appendix.
5. The R5MCAN EMS Medication Bag Oversight Committee will assign each EMS agency a number of bags and boxes consistent with their number of licensed ALS vehicles.
6. The R5MCAN EMS Medication Bag Oversight Committee will assign each participating hospital pharmacy a number of bags and boxes consistent with their expected volume of exchanges.
7. Additional bags and/or boxes will be issued to EMS agencies at the discretion of the local EMS Medical Director or his/her designee.
8. For special events requiring additional ALS vehicles or EMS staff to be in service, EMS agencies may contact their local hospital pharmacy to arrange to sign-out additional medication bags and/or controlled substance boxes temporarily.

EXCHANGE PROCEDURES:

1. EMS Medication Bags

A. R5MCAN EMS medication bags contain the following pockets:
   i. Blue pocket – IV supplies, restocked by paramedic / EMS provider.
   ii. Green pocket – Frequently used medications and supplies, paramedic or pharmacy restocked depending on facility/agency agreement and paramedic qualifications.
   iii. Black (main) pocket – Medications restocked by pharmacy
   iv. Red pocket – Sharps container
   v. Yellow pocket – Controlled substance box restocked by pharmacy
B. Refer to the R5MCAN EMS Medication Bag and Controlled Substance Box Exchange Matrix (Appendix 7) for exchange procedures specific to each participating hospital. Hospitals without 24 hour on-site pharmacy services may have procedures for “after

hours" that differ from those during normal business hours.

C. Paramedics must fill out the R5MCAN EMS Medication Bag Refill Form (Appendix 8) for any medications or supplies used from the black or green compartments when turning in the bag for restocking by pharmacy. The R5MCAN EMS Medication Bag Refill Form should be placed in the used bag after completion.
D. When paramedic stocked compartments of the EMS medication bag are opened in the course of patient care, paramedics may restock those compartments following hospital-specific procedures with the following stipulations.
    i. Paramedics must have successfully completed the R5MCAN limited paramedic restock training module before being granted ADM or medication cabinet access (if available).
    ii. The hospital is one of the EMS agencies local hospital(s) as defined in appendix 7 and must allow limited paramedic restock.
    iii. Paramedics are responsible for verifying that all paramedic stocked supplies and medications listed on the regional medication and equipment formulary are present and in-date upon stocking.
    iv. Paramedic stocked compartments must be secured by a white lock with the identifier of the EMS agency, the name or initials of the paramedic restocking the compartment, and the name and expiration date of the next item to expire in the compartment written on it.
E. When the pharmacy stocked compartment of the EMS medication bag is opened in the course of patient care, paramedics are to exchange the medication bag itself for another bag at the destination hospital.
    i. When turning in a used medication bag, the paramedic must ensure trash, contaminated waste and any potential sharps have been removed from the bag and then seal the pharmacy stocked compartment with the included red tag.
    ii. The paramedics must remove the LOCKED controlled substance box, sharps box, and IV kit from the open bag, moving those items to the new medication bag obtained from the destination hospital.
    iii. If the bag exchange is occurring at a hospital in the region that is NOT the agency's "local" hospital, or one without a provision for paramedic restock, a full bag exchange will be done. In those cases, any used compartments will be sealed with a red tag and the paramedic will remove the LOCKED controlled substance box, sharps box, and IV kit from the open bag, moving those items to the new medication bag obtained from the destination hospital.

2. EMS Controlled Substance Boxes

A. Refer to the Regional EMS Medication Bag and Controlled Substance Box Exchange Matrix (Appendix 7) for exchange procedures specific to each participating hospital. Hospitals without 24 hour on-site pharmacy services may have procedures for "after hours" that differ from those during normal business hours.
B. EMS ALS units should only operate with a confirmed LOCKED controlled substance box on board. Under NO circumstances will an open box go into service.
C. Paramedics exchanging controlled substance boxes must be in uniform and have a valid picture ID (either a driver's license or agency/regionally issued ID).
D. When a controlled substance box is used, the R5MCAN Controlled Substances Documentation Form (Appendix 9) must be completely filled out prior to exchanging the box.
    i. Any medication waste and/or disposal of empty vials must be witnessed and cosigned on the controlled substances documentation form by a registered nurse, pharmacist, or physician.
E. A copy of the **EMS patient care record (PCR) or 5th District EMS Field Notes (appendix 1)** must be placed in the controlled substance box being turned in.
    i. The PCR/5th District EMS Field Note serve as a record of the prescription for the administration of medications given to a patient as prescribed in protocol or by

medical control.

ii. PCR/5th District EMS Field Note must list the date of service, EMS agency run number, medication(s) administered, any wasted medication(s), name of the paramedic administering the medication and the corresponding controlled substances box number.

iii. PCR/ePCR/5th District EMS Field Note must include the wasted medication type, amounts, and volumes in addition to the narcotics box number and broken green tag number.

F. When turning in a used controlled substance box, the paramedic must ensure trash, empty vials, contaminated waste and any potential sharps have been removed from the box and then seal it with the pharmacy-included, numbered red lock. The red lock number must match the one written on the box's label.

G. Upon receiving a used box from an EMS service, pharmacy staff will check to assure that it is properly sealed with a red tag and includes a fully completed R5MCAN Controlled Substances Documentation Form and EMS PCR/5th District EMS Field Note. The submitted documentation will be checked by the pharmacist against the remaining contents of the box to assure accountability, with deficiencies reported as described in the next section.

H. Pharmacies must carefully document paramedic narcotic utilization and restocking of controlled substance boxes. See Appendix 10 for a sample documentation log. PCRs/Field Notes, R5MCAN Controlled Substances Documentation Forms, and restocking logs must be saved for five years.

I. Restocked controlled substance boxes must be secured by the pharmacist with a numbered green lock. Prior to taking a new controlled substance box, the paramedic must ensure that the box is properly secured/stocked, drugs are inaccessible, and that the green lock number matches the one written on the box's label.

ACOUNTABILITY:

1. Incident Reporting

A. Controlled substance boxes that appear damaged from routine use / normal wear and tear must be reported to the R5MCAN EMS medication bag oversight committee via the R5MCAN on-line occurrence form and the box must be taken to the EMS agency's local hospital pharmacy for change out.

B. Discrepancies found on pharmacy inspection of the medication bags should be reported to the Oversight Committee via the R5MCAN on-line occurrence form.

C. Any suspected system diversion of controlled substances including but not limited to a missing controlled substance box, missing controlled substance vials in a box, evidence of tampering with controlled substance vials (including missing caps or vial breakage), or evidence of suspicious damage to / tampering with a controlled substance box, will immediately be reported to Kalamazoo County Medcom at **(269)-226-3366** .

i. Kalamazoo County Medcom will notify the on-call R5MCAN EMS medication bag oversight committee member.

ii. The R5MCAN EMS medication bag oversight committee member will immediately notify the local MCA medical director, EMS agency manager / director, and the appropriate hospital pharmacy.

iii. The R5MCAN EMS medication bag oversight committee member will assist local level entities in the coordination of a timely formal investigation. Law enforcement investigation will be included as needed.

iv. Report of missing controlled substances will be made to the State of Michigan Board of Pharmacy and to the U.S. Drug Enforcement Agency by the pharmacy in accordance with State and Federal laws and regulations.

v. Pharmacies may, based on hospital policies, test patients that have received pre-hospital narcotics.

D. Local Medical Control Authorities in cooperation with pharmacies may require that EMS controlled substances be tested prior to waste at any time.

E. Suggestions for process improvement should be forwarded to the R5MCAN EMS

Medication Bag Oversight Committee.

2. EMS Medication Bag and Controlled Substance Box Audits:

A. All EMS medication bags and controlled substance boxes used in the regional exchange program must be accounted for on a monthly basis. On the first Tuesday of each month, each EMS agency, MCA or pharmacy having EMS medication bags or controlled substance boxes must perform an accounting of medication bags and controlled substance boxes between 6AM and 9AM and then log the bag or box numbers into the R5MCAN on-line audit form prior to noon that same day.

APPENDICES:

1. 5DMRC Field Note
2. SAMPLE DOCUMENT ONLY--R5MCAN EMS Agency Replenishing Agreement
3. R5MCAN EMS Medication Bag Contents List with Images
4. Sample R5MCAN Pharmacy EMS Bag Restocking Sign-off Form
5. R5MCAN Medication Bag and Controlled Substances Regional Exchange Program End User Agreement
6. Sample R5MCAN EMS Agency Controlled Substances Log Sheet
7. R5MCAN EMS Medication Bag and Controlled Substance Box Exchange Matrix
8. R5MCAN EMS Medication Bag Refill Form
9. R5MCAN Controlled Substances Documentation Form
10. Sample Hospital Controlled Substance Box Restocking Log
11. Sample R5MCAN EMS Medication Bag Exchange Log
12. R5MCAN Medical Director Signature Page

Appendix 1

5th District EMS Field Note

5th District EMS Field Notes MFR/AMB. Run # _____ / _____

Date _____ Incident Location _____

MFR Agency _____ Amb.Svc./Unit _____

Destination _____ Med. Control _____ Time ___ : ___

Patient Name _____ Age/Sex ____ [] M [] F

Address _____ DOB ___ / ___ / ___

City/State/Zip Code _____ Phone (___) _____

Med/Surg Hx _____

[]None []Asthma []Cancer []Cardiac []CHF []COPD []CVA []Diabetes []ETOH []HTN []Renal []Seizures

Meds _____

[]None [] ASA []Lasix []Lipitor []Lisinopril []Metformin []Norvasc []Synthroid []Vicodin []Warfarin []Zocor

Allergies _____

[]NKDA []PCN []Sulfa [] Keflex []Codiene []Morphine []Demerol []Vicodin []ASA []Motrin []Latex []Tape

IV: Time ___ : ___ Location _____ Size ____ ga. Att. ____ Rate _____

VITALS						MEDICATIONS/PROCEDURES		
Time	P	R	B/P	SpO2	BLG	Time	Med/Proc	Amt/Size

Notes _____

_____ Hospital Personnel Name/Signature

_____ EMT/Paramedic Name/Signature

Appendix 2

SAMPLE R5MCAN EMS Agency Replenishing Agreement

(Agreement between EMS Agencies and local/primary pharmacy)

EMS Agency Replenishing Agreement

Date:_____

EMS Agency Name:_____ Hospital Name:_____

EMS Agency Address:_____ Hospital Address:_____

EMS Agency Manager:_____ Hospital Representative:_____

EMS Agency Manager Phone Number:_____ Hospital Representative Phone #:_____

EMS Agency Manager Email:_____ Hosp. Representative Email:_____

Please accept this letter as a formal contract for _____, a State of Michigan licensed hospital herein identified for the purposes of this contract ("**Contract**") as "**Hospital**", to provide to _____, a State of Michigan licensed emergency medical services (EMS) provider herein identified for the purposes of this Contract as the "**EMS Agency**", medications, medical supplies, and other items (collectively, the "**Supplies**") necessary for the care and transport of patients.

1. **Replenishment of Supplies**. **Hospital** agrees to provide Supplies to EMS Agency on a "replenishment" basis, to replace EMS Agency's medications, medical supplies, and other agreed upon items used in the transport of a patient by EMS Agency to a Hospital facility. To request the replenishment of non-pharmaceutical Supplies, EMS Agency will provide a report to the Hospital as requested detailing the specific type and amount of Supplies used on the transported patient and requested for replenishment. With respect to pharmaceutical Supplies, EMS Agency will complete a Pharmacy Requisition Form, requesting only those pharmaceutical items used in the transport of a patient and necessary for replenishment. EMS Agency shall present the Pharmacy Requisition Form to Hospital's Pharmacy Department for fulfillment. Hospital will make reasonable efforts to promptly provide the requested Supplies; however Hospital makes no guarantee regarding the availability of any particular Supplies.

2. **Purchase Price; Payment**. Hospital will provide Pharmaceutical Supplies to an ambulance provider at no charge. Hospital will charge flat service fees on each EMS bag replenished based on recommendations by the Region 5 Medical Control Authority Network (R5MCAN) and will be invoiced on a regular agreed upon frequency. Payment is due within thirty (30) days of the date of the invoice. The parties represent that the purchase price for the Supplies is the fair market value for such Supplies and that this Contract does not take into account the volume or value of any referrals or business otherwise generated between the parties for which payment may be made under any state or federal health care program.

3. **Record Keeping**. The parties mutually agree to maintain records detailing the type, and amount, of Supplies used as well as the patient transport to which the purchase of Supplies related ("**Records**"). The parties agree to maintain the Records for a period of at least five (5) years from the date the Records were created. Each party further agrees to provide copies of the Records to the other party within **48 hours** of a written request. The parties shall promptly make

the Records available to the Secretary of the Department of Health and Human Services upon request.

4. **Patient Billing**. The parties agree that EMS Agency shall have the sole right to bill patients, insurance providers, and/or state or federal health care programs for use of the Supplies. EMS Agency agrees to issue all bills for the Supplies in compliance with applicable state and federal health care program payment and coverage rules and regulations.

5. **Representations and Warranties**. EMS Agency represents and warrants that (i) it has all necessary licenses and/or permits to use the Supplies; (ii) it will use all Supplies in accordance with the manufacturer's instructions or in the manner specified by direct medical control oversight; (iii) it will use all Supplies in accordance with all local, state, and federal laws and regulations; (iii) all reports, records, and documents, in whatever form or format, provided to Hospital will be true and complete; and (iv) it will only request the Supplies necessary to replenish items used in the transport of a patient to Hospital's facility. Hospital expressly disclaims all warranties, express or implied, with respect to the Supplies, including the warranty of fitness for a particular purpose. Hospital makes no representations regarding the quality or safety of the Supplies and disclaims all liability for the Supplies and EMS Agency's use of the Supplies.

6. **Insurance**. EMS Agency will obtain and maintain insurance, at its own cost and expense, during the term of this Contract in coverage amounts no less than $1,000,000 per occurrence and $3,000,000 annual aggregate, naming Hospital as an additional insured, and covering, at a minimum, (a) general liability; (b) professional liability; (c) workers' compensation with statutory limits; and (d) any other coverage reasonably necessary to protect EMS Agency and Hospital, as well as their theirs agents and employees from any claims arising from its obligations under this Contract. EMS Agency agrees to provide certificates of insurance, evidencing required insurance coverage, upon execution of this Contract.

7. **Indemnification**. Each party agrees to indemnify, hold harmless and defend the other and its affiliates, officers, directors, agents and employees from and against any claims, damages, liabilities, expenses, or losses (including attorneys' fees) arising from the performance or breach of this Contract by the indemnifying party or the acts or omissions of the indemnifying party or its employees or agents; provided that neither party shall assume any liability for any act or omission of the other party or its employees or agents. EMS Agency will indemnify, hold harmless and defend Hospital and its affiliates, officers, directors, agents and employees from and against any third party claims, damages, liabilities, judgments (including related attorneys' fees) arising from EMS Agency's use or misuse of the Supplies. The parties expressly agree that Hospital's liability under this Contract shall be limited to the total amount paid by EMS Agency to Hospital for Supplies.

8. **Independent Contractor**. Nothing in this Contract is intended to create an employer/employee relationship or a joint venture relationship between the parties.

9. **Corporate Compliance**. Through the implementation of this Contract, each party acknowledges the commitment to legal compliance and agrees to conduct all transactions which occur pursuant to this Contract in accordance with all applicable federal, state and local laws and regulations. Any material violations of applicable law will be considered a breach of this Contract. By signing this Contract, EMS Agency represents and warrants that neither it nor any of its employees is, or has been, excluded from participation in any federally and/or state funded health care programs, including but not limited to Medicare, Medicaid, and CHAMPUS. EMS Agency agrees to promptly notify Hospital of any proposed or actual exclusion, of it or any of its employees, from any federally and/or state funded health care program.

10. **No Exclusivity**. Each party acknowledges that no representation, inducement or condition not set forth herein has been made or relied upon by either party, and that the Contract will in no way be construed or interpreted to be an exclusive arrangement between Hospital and EMS Agency.

11. **Confidentiality**. EMS Agency agrees not to disclose to third parties any nonpublic or proprietary information regarding Hospital or its business, operations, plans, strategies or patients, including the existence and terms of this Contract, or to use such information itself for any purpose other than performing this Contract, without Hospital's prior written approval. Except as otherwise expressly provided in this Section, Hospital and EMS Agency hereby mutually covenant and agree (i) to keep the terms of this Contract, including the pricing (collectively, the "**Confidential Information**"), strictly confidential, and (ii) not to disclose the Confidential Information to any third party. Hospital and EMS Agency may disclose the Confidential Information to any entity with which they are affiliated, in the usual and customary operation of business, including, but not limited to, disclosure to third party auditors and attorneys. In addition, the foregoing confidentiality obligation shall not apply to information that is required to be disclosed by law; provided, however, that the receiving party so required to disclose shall first notify the disclosing party to enable it to seek relief from such requirement, and render reasonable assistance requested by the disclosing party in connection therewith. This Section and the confidentiality obligations contained herein shall survive the expiration or earlier termination of this Contract.

12. **HIPAA**. EMS Agency agrees to comply with the health information privacy provisions of the Health Insurance Portability and Accountability Act of 1996 and all regulations thereunder ("**HIPAA**"), as well as all policies, procedures and practices of the Hospital relating to HIPAA privacy, confidentiality and security of patients' health information. EMS Agency further acknowledges and agrees that from time to time HIPAA may require modification of this Contract for compliance purposes. Each party will cooperate with, and assist, the other party to ensure full compliance with HIPAA with regard to this Contract. EMS Agency agrees to execute a HIPAA Business Associate Agreement or similar agreement upon request by Hospital.

13. **Access to Records**. The parties agree to treat this Contract as falling under Section 1861(v)(1)(I) of the Social Security Act and the regulations issued at 42 C.F.R. Part 420, and to make available to the Comptroller General of the United States, the Department of Health and Human Services ("**HHS**") and their authorized representatives, for a period of five (5) years after the latest furnishing of Supplies under this Contract, access to the books, documents and the records, and such other information as may be required by the Comptroller General or the Secretary of HHS to verify the nature and extent of the cost for Supplies provided by EMS Agency.

14. **Term/Termination**. The term of this Contract will commence on the date this Letter is fully executed by the parties and shall continue for a term of one (1) year. This Contract shall automatically renew for successive one (1) year terms, unless terminated earlier. Either party may terminate this Contract at any time, by thirty (30) days' prior written notice. In addition, this Contract may be terminated immediately by Hospital if Hospital determines in its sole discretion that EMS Agency has violated a state or federal law or regulation, or that this Contract no longer complies with state or federal laws or regulations. EMS Agency shall have continued liability upon termination for the amounts accrued and owing under the Contract as of the termination date.

15. **Governing Law**. The terms and conditions of this Contract shall be governed, construed, interpreted and enforced in accordance with the domestic laws of the state of Michigan, excluding choice of law principles. No waiver by either party of any right or remedy under this Contract, or

delay in the exercise thereof, will constitute a waiver of any other right or remedy.

16. **Assignment**. EMS Agency will not assign this Contract or delegate any duties without prior written consent of Hospital. Hospital may assign this Contract to any of its subsidiaries.

17. **Arbitration**. **Hospital** may, at its exclusive option, require that any controversy or claim arises out of or relating to this Contract be settled by binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association by one arbitrator appointed in accordance with said rules. Any controversy or claim will be arbitrated on an individual basis and will not be consolidated in any arbitration with any claim or controversy of any other party. The parties specifically instruct the arbitrator to consider rulings, orders, and awards (either interim, interlocutory, partial or final) of equitable relief, including directing specific performance or issuing an injunction, particularly if an award of money damages alone would not sufficiently compensate the claiming party. Judgment on the arbitrator's award may be entered in any state or federal court having subject matter jurisdiction and located in the Western District of Michigan, and the parties hereby irrevocably consent to the jurisdiction of such courts for the purpose of enforcing any such award. The arbitrator will allocate in the final award all costs incurred in conducting the arbitration in accordance with what the arbitrator deems just and equitable under the circumstances provided that each party will pay for and bear the cost and expense of its own experts, evidence, and legal counsel.

18. **Survival**. Contract terms and rights under the Sections of this Contract titled Representations and Warranties, Insurance, Indemnification, Confidentiality and Arbitration will survive any termination or expiration of this Contract.

19. **Use of Hospital's Name**. EMS Agency will not use the names, trademarks, service marks or logos of Hospital or any of its affiliates in any written materials, including without limitation, press releases, advertisements, websites or other promotional materials, without Hospital's prior written consent.

20. **Entire Agreement**. This Contract constitutes the entire agreement between the parties with respect to its subject matter and supersedes any prior oral or written agreements concerning same. This Contract may be modified only by a writing executed by both parties. The Contract may be executed in two or more counterparts (including by means of faxed or e-mailed signature pages), each of which will be deemed an original, and all of which together will constitute one and the same instrument. Photocopies, facsimile transmissions and other reproductions of this executed original (with reproduced signatures) will be deemed original counterparts of this Contract. Electronic signatures and electronically transmitted documents are binding.

Appendix 2

SAMPLE R5MCAN EMS Agency Replenishing Agreement

(Agreement between EMS Agencies and local/primary pharmacy)

Please execute this Contract and return a copy to _____ via email, sent to:_ _____ Any notice to the above mentioned hospital under this Contract must also be provided to this email address.

AGREED AND ACCEPTED:

EMS AGENCY Representative	**HOSPITAL Representative**
By: _____ (Signature)	By: _____ (Signature)
_____ (Type or Print Name)	_____ (Type or Print Name)
Its: _____ (Type or Print Title)	Its: _____ (Type or Print Title)
Date: _____	Date: _____

EXHIBIT A

PHARMACY REQUISITION FORM

ATTACHED

Appendix 3

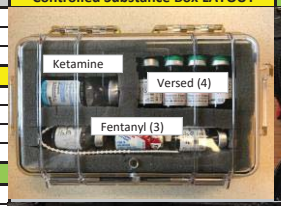
R5MCAN EMS Medication Bag Contents List

TXA - KIT - Hospital Stock

PAR	Medication / Item	Description
1	TXA	1g/10mL vial
1	Inclusion/Exclusion Card	
1	Medication Added Label	
Controlled Substance Box - Hospital Stock		
3	Fentanyl	100mcg/2ml vial
4	Midazolam	5mg/1ml vial
1	Ketamine	500mg/5ml vial
1	Red Tag	Used to seal used box
Green Pocket MEDICATIONS - Medic Stock		
3	Acetaminophen + oral syringes	160mg/5ml
3	Acetaminophen	325mg tab
4	Albuterol	2.5mg/3ml
8	Aspirin	81mg blister pack tab
1	Dextrose 10%	250ml w/ Macro set
1	Diphenhydramine	50mg/1ml vial
2	Duoneb (Albuterol/Ipratroprium)	0.5mg/3ml
3	Ibuprofen Liquid	100mg/5ml
3	Ibuprofen	200mg tab
1	Ketorolac (Toradol)	15mg/1ml vial
1	Methylprednisolone	125mg/2ml vial
2	Naloxone	2mg/2ml pre-fill
2	Naloxone	4mg nasal spray
1	Nitroglycerin	0.4mg (25 count bottle)
2	Ondansetron Vial	4mg/2ml vial
2	Ondansetron ODT	4mg single dose
1	Prednisone	50mg oral tablet
2	Sodium Chloride 0.9%	100ml w/ 1 Macro set
Green Pocket EQUIPMENT - Medic Stock		
2	Medication Cannula - Needleless	
1	Microdrip IV set	60gtts/ml
1	Nebulizer	
2	Needles 18/19ga	1.5" Safety
2	Needles 22/23ga	1.5" Safety
2	Piggyback Labels	Colored
2	Syringe	1ml
2	Syringe	3ml
2	Syringe	5ml
2	Syringe	10ml
2	Syringe	20ml
4	Sodium Chloride 0.9%	10ml Pre-fill

R5MCAN
Region 5 Medical Control Authority Network

Controlled Substance Box LAYOUT



Green Pocket Interior Folded LAYOUT

Main Compartment - Hospital Stock

PAR	Medication	Description
3	Adenosine	6mg/2ml vial
2	Atropine	1mg/10ml pre-fill
1	Calcium Chloride 10%	1g/10ml pre-fill
1	Dextrose 10%	250ml bag
2	Epinephrine	1mg/1ml vial
8	Epinephrine	1mg/10ml pre-fill
1 ea	Epinephrine - Racemic 2.25% + NS 3mL ampule	0.5ml ampule + 3 mL ampule
1	Glucagon	1mg vial w/ 1ml sterile H2O
3	Lidocaine 2%	100mg/5ml pre-fill
4	Magnesium Sulfate	1g/2ml vial
1	Sodium Bicarbonate 8.4%	50mEq/50ml pre-fill
2	Verapamil	5 mg/2ml vial
2	Cefazolin	1g powder vial
Red Pocket - Medic Stock		
1	Sharps Container	1.4Quart

Blue Pocket (IV Kit) EQUIPMENT - Medic Stock

PAR	Item	Description
6	Alcohol wipes	
4	Gauze	4x4
1	Intraosseous needle	EZ IO / Jamshidi
2	IV Catheter 14ga	1&1/4"
2	IV Catheter 16ga	1&1/4"
2	IV Catheter 18ga	
2	IV Catheter 20ga	
2	IV Catheter 22ga	
2	IV Catheter 24ga	
2	IV Extension set	33" with 4-way stopcock
3	IV Extension set	7.6"
2	IV Start Kit	W/ Chlorhexidine 2% prep
1	Macrodrip IV set	10 or 15gtts/ml
4	Medication Cannula - Needleless	
1	Microdrip IV set	60gtts/ml
1	Mucosal Atomizer Device	LMA MAD300
2	Sodium Chloride 0.9%	10ml Pre-fill
2	Sodium Chloride 0.9%	500ml bag
1	Tape (Durapore / Transpore)	1"

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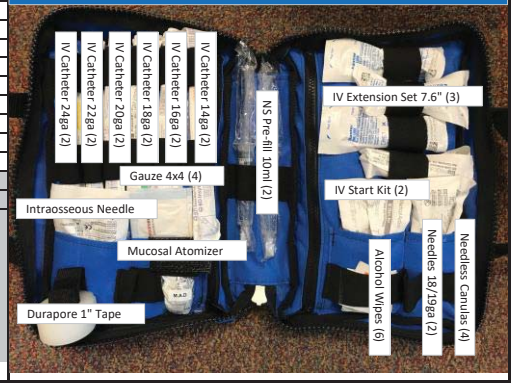
Main Compartment LAYOUT

IV Kit LAYOUT



Epinephrine Auto-Injector Procedure

Aliases: Epi-Pen ®

Purpose: To outline the use and resupply of epinephrine auto-injector/pediatric epinephrine auto-injector by authorized prehospital providers for life-threatening anaphylaxis and respiratory emergencies as outlined in applicable treatment protocols Providers must be licensed at or above the Emergency Medical Technician level unless otherwise specified by MCA selection. .

MCA Approval of **Epinephrine Auto-injector** for Select MFR Agencies

◉ YES ○ NO

MCAs will be responsible for maintaining a roster of the agencies choosing to participate and will submit roster to MDHHS

1. **Indications**
   - A. Life-threatening allergic/anaphylactic and respiratory emergencies
   - B. Use is outlined in applicable treatment protocol
2. **Contraindications**
   - A. No absolute contraindications to life-threatening allergic/anaphylactic emergencies as described in applicable treatment protocols.
3. **Cautions**
   - A. Use with caution in patients with heart disease, high blood pressure, and stroke.
   -  B. Contact Medical Control if child appears to weigh less than 10 kg (approx. 20 lbs.) prior to administration if possible.
4. **Technique**
   - A. **Epinephrine auto-injector** is an auto-injector that injects medication into the intramuscular tissue when the device is pushed against the skin. Injection is to be done at the anterolateral portion of the thigh.
   - B. Dosing:
     - i. **Epinephrine auto-injector** (0.3 mg) is used for patients weighing over 30 kg (approx. 60 lbs.)
     - ii. **Pediatric epinephrine auto-injector** (0.15 mg) is used for patients weighing between 10-30 kg (approx.20-60 lbs.)
     -  iii. Contact Medical Control if child appears to weigh less than 10 kg (approx. 20 lbs.), prior to **pediatric epinephrine auto-injector** administration, if possible
   - C. Instructions for use are pictured on the side of each auto-injector.
   - D. The auto-injector must be held in place for ten (10) seconds once the needle injects into the thigh.

5. **Documentation**
   A. EMS providers will document any changes in the patient's condition and report those changes to on-line medical control.
   B. Complete the Epinephrine Auto-injector Utilization Form as required by MCA.
6. **Accountability**
   A. **Epinephrine auto-injectors** will be stored in a secured compartment in a temperature-controlled area of the EMS vehicle.
   B. **Epinephrine auto-injectors** must be restocked at the pharmacy or through other Medical Control approved process in conformity with current pharmacy laws and the public health code. Utilization forms must be completed for each use.

Epinephrine auto-injector Utilization Form
(To be used by Hospital)

Drug	Standard	Quantity	Count	Exp. Date
Epinephrine auto-injector	0.3 mg	1	_____	_____
Pediatric Epinephrine auto-injector	0.15 mg	1	_____	_____

Run Date _____

Patient Name _____

Physician _____

EMT or MFR _____

Receiving Hospital _____

Naloxone Leave Behind Medication Kit Contents and Distribution Procedure (MCA OPTIONAL)

☑ Medical Control Authorities choosing to adopt this supplement may do so by selecting this check box. Adopting this supplement changes or clarifies the referenced protocol or procedure in some way. This supplement supersedes, clarifies, or has authority over the referenced protocol.

I. Medications and supplies for naloxone kits will be supplied by participating pharmacies or the MCA

II. Assembly, labeling, and access to kits will be done according to the **Pharmacy, Drug Box and IV Supply Exchange Procedure.**

III. Overdose Medication Kit Contents List

Medication / Item	Concentration	Packaging	Quantity
Naloxone (Narcan)	4mg / spray	Nasal Spray	1
MDHHS Safety Advice for Patient and Family Members Card			1
Resuscitation Face shield*			1* *(MCA Optional)
Replacement Form			1
Local Treatment Resources Form			1

IV. Procedure

A. Each participating EMS Agency will stock each of its licensed vehicles with 2 Naloxone Medication Kits. After deployment, the naloxone medication kit will be replaced within 24 hours at the assigned stocking hospital pharmacy.

B. Kits will be stored on the EMS vehicle in a secure way, not accessible to the public.

C. Deployment of a Naloxone Medication Kit will be documented the patient care record and uploaded to the Michigan EMS Information System.

D. The replacement/use form will be completed and returned to the designated hospital pharmacy for dispensing of a replacement Naloxone Kit.

MEDICATIONS (General)

A medication reference protocol (9-R series) is only applicable when used in conjunction with an MCA approved treatment protocol.

Medication Reference Protocols do not address licensure level, pre/post radio requirements, or other medications/procedures/assessments that may be required between initial dose and subsequent doses.

Medication Reference Protocols apply to the Michigan standardized EMS protocol suite Sections 1-10; therefore indications/contraindications are aligned with protocol restrictions (such as allowable age for administration) and may be more confining than the actual indications/contraindications of the medication.

Age:

1. Adult: patient > 14 years of age (will appear as "Adult" in the 9R series without age explanation)
2. Pediatric: patient ≤ 14 years of age (will appear as "Pediatric" in the 9R series without age explanation)
3. A medication with an age restrictions/considerations will be expressed as such in the 9R series.

Indications:

1. Indication(s) listed are in conjunction with protocols, there may be other uses for which EMS is not authorized to use a medication.

Contraindications:

1. Hypersensitivity to a medication is a contraindication to that medication. This applies to ALL medications and will not be restated on individual medication protocols.

Order of Operation

1. Adult (patients > 14 years of age):
    a. Indications for medication use
        i. Protocol (Sections 1-8,10)
        ii. Medication Protocols (Section 9-9R)
    b. Dosing
        i. Protocols (Sections 1-8,10)
        ii. Medication Protocols (Section 9-9R)
2. Pediatric (patients ≤ 14 years of age)
    a. Indications for medication use
        i. Protocol (Sections 1-8,10)
        ii. Medication Protocols (Section 9-9R)

b. Dosing
   i. MI MEDIC cards
   ii. Treatment and/or Procedure Protocol (Sections 1-8, 10)
   iii. Medication Protocols (Section 9-9R)

Acetaminophen

Pharmacological Category: Analgesic, Nonopioid

Routes: PO

Indications:
1. Fever
2. Mild pain

Contraindications:
1. Known severe acute liver disease

Precautions:
1. Has received acetaminophen (I.e., Tylenol) or any medication containing acetaminophen (e.g., cold medication) in last four (4) hours.
2. Patient must be alert enough to take PO medication.

Expected effects:
1. Fever reduction
2. Pain relief

Side effects:
1. Nausea/vomiting

Notes:
1. Children < 60 days old require a documented rectal temperature (including time temperature obtained) prior to acetaminophen administration.

Dosing: PEDIATRIC FEVER
Indication: Fever
Pediatrics administer:
1. According to MI MEDIC cards
2. If MI MEDIC cards are not available administer using dosing chart below.

Dosing: PAIN MANAGEMENT
Indication: Mild Pain
Adults administer:
1. Acetaminophen 650 mg PO

Pediatrics administer:
1. According to MI MEDIC cards
2. If MI MEDIC cards are not available use dosing chart below.

Children's Acetaminophen Elixir Dosing Table		
Child's Weight	Child's Age	**Acetaminophen** 160 mg/5mL
3-5 kg (6-12 lbs.)	0-2 mos.	1.25 mL (40 mg)
6-7 kg (13-16 lbs.)	3-6 mos.	3 mL (96 mg)
8-9 kg (17-20 lbs.)	7-10 mos.	4 mL (128 mg)
10-11 kg (21-25 lbs.)	11-18 mos.	5 mL (160 mg)
12-14 kg (26-31 lbs.)	19 mos.-35 mos.	6 mL (192 mg)
15-18 kg (32-40 lbs.)	3-4 yrs.	7 mL (224 mg)
19-23 kg (41-51 lbs.)	5-6 yrs.	9 mL (288 mg)
24-29 kg (52-64 lbs.)	7-9 yrs.	12 mL (384 mg)
30-36 kg (65-79 lbs.)	10-14 yrs.	15 mL (480 mg)

Used in the Following Protocols
Pediatric Fever (Section 4 Obstetrics and Pediatrics)
Pain Management (Section 7 Procedures)

Adenosine

Pharmacological Category: Antiarrhythmic Agent, Miscellaneous; Diagnostic Agent

Routes: IV rapid push

Indications:
1. Stable but symptomatic supraventricular tachycardia that is a regular and narrow rhythm (i.e., SVT, A-Flutter) that does not convert with approved vagal maneuver.

Contraindications:
1. Patients with diagnosed sinus node dysfunction (e.g., sick sinus syndrome, WPW syndrome) unless pacemaker is present and functioning
2. Patients with diagnosed or observed high-grade AV block (i.e., 2nd or 3rd degree heart block) unless pacemaker is present and functioning
3. Patients with diagnosed asthma

Precautions:
1. Be prepared for fluid resuscitation if required
2. Monitor for polymorphic V-Tach
3. Be prepared for full resuscitation efforts.

Expected effects:
1. Slowed conduction through the AV node
2. Conversion to NSR

Side effects:
1. Hypotension – may produce profound vasodilation
2. Flushing
3. Dyspnea
4. Light-headedness
5. Nausea
6. Feeling of impending doom
7. Seizures

Notes:
1. Use most proximal injection site
2. Follow immediately with NS flush
3. Record using cardiac monitor during and after administration

Dosing: TACHYCARDIA (Adult)
Indication: Symptomatic SVT
Adults administer:

1. Adenosine 6 mg rapid IV push followed immediately with 20 mL NS flush
2. If conversion does not occur, and the rhythm persists, administer adenosine 12 mg rapid IV push followed immediately with 20 mL NS flush

Dosing: PEDIATRIC TACHYCARDIA
Indication: Symptomatic SVT
Pediatrics administer:

1. According to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
   a. Adenosine 0.1 mg/kg (max dose 6 mg) rapid IV push immediately followed by 10 mL flush
   b. If conversion does not occur, and the rhythm persists administer 0.2 mg/kg ___ ___(max of 12 mg) rapid IV push immediately followed by 10 mL NS flush

Used in the Following Protocols
Tachycardia (Section 5 Adult Cardiac)
Pediatric Tachycardia (Section 6 Pediatric Cardiac)

Albuterol

Pharmacological Category: Beta-2 Agonist, Bronchodilator

Routes: Nebulized

Indications:
1. Bronchospasm (wheezing)
2. Known or suspected hyperkalemia resulting from a crush injury.

Expected effects:
1. Bronchodilation
2. Decreased respiratory work/effort

Dosing: RESPIRATORY DISTRESS (Adult)
PEDIATRIC RESPIRATORY DISTRESS
ANAPHYLAXIS/ALLERGIC REACTION
PULMONARY EDEMA/CARDIOGENIC SHOCK

Indication: Respiratory distress with wheezing
Adults administer:
1. Albuterol 2.5 mg/3mL NS nebulized

Pediatrics administer:Albuterol dosage is not weight/age based
1. Albuterol 2.5 mg/3mL NS nebulized *(Albuterol dosage is not weight/age based)*

Dosing: GENERAL CRUSH INJURY
Indication: Suspected hyperkalemia due to crush injury
Adults administer:
1. Albuterol 2.5 mg/3mL NS nebulized to a maximum dose of 20 mg

Pediatrics administer:
1. According to MI MEDIC cards
2. If MI MEDIC cards are not available administer Albuterol 2.5 mg/3mL NS nebulized to a maximum dose of 20 mg

Note: A single responding unit is not expected to carry 20 mg of albuterol for treatment of up to 20 mg in Crush Injury protocol. Dosage is a maximum if other resources (i.e., Haz Mat drug box, second drug box) are available.

Used in the Following Protocols
Anaphylaxis/Allergic Reaction (Section 1 General Treatment)
General Crush Injury (Section 2 Trauma and Environmental)
Respiratory Distress (Section 3 Adult Treatment)
Pediatric Respiratory Distress, Failure or Arrest (Section 4 Obstetrics and Pediatrics)
Pulmonary Edema/Cardiogenic Shock (Section 5 Adult Cardiac)

Amiodarone

Pharmacological Category: Antiarrhythmic Agent

Routes: IV/IO

Indications:
1. Cardiac Arrest (V-Fib or pulseless V-Tach)
2. Tachycardiac that is stable but symptomatic (i.e., does not require immediate cardioversion)
    a. Rhythm is irregular and narrow (i.e., A-Fib/A-Flutter)
    b. Rhythm is regular with a wide QRS (i.e., V-Tach, SVT/A-Flutter with aberrancy)

Contraindications:
1. Cardiogenic Shock
2. Severe sinus node dysfunction
3. Bradycardia with syncope except with functioning artificial pacemaker

Expected effects:
1. Prolongs refractory period
2. Inhibits alpha and beta adrenergic stimulation

Side effects:
1. Prolonged QT
2. Vasodilation
3. Hypotension

Dosing: CARDIAC ARREST (Adult)
Indication: V-Fib/V-Tach
Adults administer:
1. Amiodarone 300 mg IV/IO (May repeat once 150 mg IV/IO)

Dosing: TACHYCARDIA (Adult)
Indication: Irregular Narrow rhythm (i.e., A-Fib/A-Flutter) or Regular Wide QRS rhythm (i.e., V-Tach, SVT/A-Flutter with aberrancy):
Adults administer:
1. Amiodarone 150 mg IV over 10 minutes

Indication: Suspected V-Tach
Adults administer:
1. Amiodarone 150 mg IV over 10 minutes as needed to a maximum of 450 mg

Dosing: PEDS CARDIAC ARREST
Indication: V-Fib/V-Tach
Pediatrics administer:

1. According to MI MEDIC Cards
2. If MI MEDIC cards are not available administer:
    a. Amiodarone 5 mg/kg (max single dose 300 mg) IV/IO. May repeat twice. Do not exceed 450 mg total

Dosing: PEDS TACHYCARDIA
Indication: Unstable Regular, Wide Complex Tachycardia
Pediatrics administer:

1. According to MI MEDIC Cards
2. If MI MEDIC cards are not available administer:
    a. Amiodarone 5 mg/kg (max single dose 300 mg) IV/IO. May repeat twice. Do not exceed 450 mg total IV/IO

Used in the Following Protocols
General Cardiac Arrest (Section 5 Adult Cardiac)
Tachycardia (Section 5 Adult Cardiac)
Pediatric Cardiac Arrest – General (Section 6 Pediatric Cardiac)
Pediatric Tachycardia (Section 6 Pediatric Cardiac)

Aspirin

Pharmacological Category: Analgesic, Nonopioid; Antiplatelet Agent; Nonsteroidal Anti-inflammatory Drug (NSAID), Oral; Salicylate

Routes: PO

Indications:
1. Suspected cardiac chest pain
2. Suspected myocardial infarction

Contraindications:
1. Hypersensitivity to nonsteroidal anti-inflammatories

Dosing: CHEST PAIN/ACUTE CORONARY SYNDROME
Indication: Cardiac chest pain/acute coronary syndrome
Adults administer:
1. Aspirin up to 325 mg PO (chew and swallow). If no aspirin taken or suspected insufficient dose taken since the onset of chest pain, administer additional aspirin to achieve a total dose of up to 325 mg.

Used in the Following Protocols
Chest Pain/Acute Coronary Syndrome (Section 5 Adult Cardiac)

Atropine

Pharmacological Category: Anticholinergic Agent; Antidote; Antispasmodic Agent, Gastrointestinal

Routes: IV/IO

Indications:
1. Severe symptomatic bradycardia
2. Exposure to organophosphates or other nerve agents when Nerve Agent (NA) Antidote Kit is not available.

Expected effects:
1. Increased heart rate
2. Dilated pupils

Note: For Nerve Agent/Organophosphate Pesticide Exposure, when NA Antidote kit is not available, pralidoxime should also be administered in conjunction with atropine when available.

Dosing: CRASHING ADULT/IMPENDING ARREST
Indication: Bradycardia
Adults administer:
1. Atropine 1 mg IV/IO

Dosing: ADULT BRADYCARDIA
Indication: Bradycardia
Adults administer:
1. Atropine 1 mg IV/IO rapid push repeating every 3-5 minutes to a total dose of 3 mg

Dosing: PEDIATRIC BRADYCARDIA
Indication: Bradycardia
Pediatrics administer:
1. According to MI MEDIC Cards
2. If MI MEDIC Cards are not available administer:
    a. Atropine 0.02 mg/kg IV/IO (minimum dose 0.1 mg, maximum single dose 0.5 mg). May repeat once in 5 minutes, if effective.

Dosing: NERVE AGENT/ORGANOPHOSPHATE PESTICIDE EXPOSURE
Indication: Nerve Agent/Organophosphate Pesticide Exposure when NA Antidote Kit is not available. See chart below for number of NA kits required based on age and symptoms.
Adults administer:
1. Atropine 2 mg IM/IV for every 1 NA kit that is required.

Pediatrics administer:

1. According to MI MEDIC cards
2. If MI MEDIC cards are not available refer to CHART A below for atropine dosage.
3. Refer to CHART B below and administer 2 mg atropine IV/IM for every one NA Antidote kit required.

CHART A

Nerve Agent/Organophosphate Antidotes/Countermeasures

Weight	Age	Duodote[1] Mod-Severe Sxs	Atropen[2] (1 mg) Mod-Severe Sxs	Atropine Dose (0.1 mg/kg) IM/IV/IO	Atropine Vial[2] (1 mg/mL)	Cardiac Atropine[2,3] (1 mg/10 mL)	Midazolam[4] (10 mg/2 mL) IM/IV/IO
3-5 kg (6-11 lbs)	**0-2 months**	**1**	**1**	**0.4 mg**	**0.4 mL**	**4 mL**	**0.1 mL**
6-7 kg (13-16 lbs)	**3-6 months**	**1**	**1**	**0.7 mg**	**0.7 mL**	**7 mL**	**0.2 mL**
8-9 kg (17-20 lbs)	**7-10 months**	**1**	**1**	**0.9 mg**	**0.9 mL**	**9 mL**	**0.2 mL**
10-11 (21-25 lbs)	**11-18 months**	**1**	**1**	**1 mg**	**1 mL**	**10 mL**	**0.2 mL**
12-14 kg (26-31 lbs)	**19-35 months**	**1**	**2**	**1.3 mg**	**1.3 mL**	**13 mL**	**0.25 mL**
15-18 kg (32-40 lbs)	**3-4 years**	**1**	**2**	**1.6 mg**	**1.6 mL**	**16 mL**	**0.3 mL**
19-23 kg (41-51)	**5-6 years**	**1**	**2**	**2 mg**	**2 mL**	**20 mL**	**0.4 mL**
24-29 kg (52-64)	**7-9 years**	**2**	**3**	**2.6 mg**	**2.6 mL**	**26 mL**	**0.5 mL**
30-36 kg (65-79 lbs)	**10-14 years**	**2**	**3**	**3.3 mg**	**3.3 mL**	**33 mL**	**0.6 mL**
Adult	**>14 years**	**2 to 3**	**4 to 6**	**4 to 6 mg**	**4 to 6 mL**	**40-60 mL**	**2 mL**

[1]Preferred initial autoinjector, [2]May Repeat atropine every 5 minutes until airway secretions decrease (6 mg maximum), [3]Not available in MEDDRUN, [4]Patients with severe symptoms should receive midazolam even if not obviously seizing

CHART B

MCA Name Calhoun County MCA
MCA Board Approval 12/7/23
MCA Implementation Date 2/1/24
MDHHS Approval: 7/19/23

	Clinical Findings	Signs/Symptoms	Required Conditions	NA Kits To Be Delivered
SELF-RESCUE	**Threshold Symptoms**	• Dim vision • Increased tearing • Runny nose • Nausea/vomiting • Abdominal cramps • Shortness of breath	Threshold Symptoms *-and-* Positive evidence of nerve agent or OPP on site Medical Control Order	1 NA Kit (self-rescue)
ADULT PATIENT > 8 years of age	**Mild Symptoms and Signs**	• Increased tearing • Increased salivation • Dim Vision • Runny nose • Sweating • Nausea/vomiting • Abdominal cramps • Diarrhea	Medical Control Order	1 NA Kit
	Moderate Symptoms and Signs	• Constricted pupils • Difficulty breathing • Severe vomiting	Constricted Pupils	2 NA Kits
	Severe Signs	• Constricted pupils • Unconsciousness • Seizures • Severe difficulty breathing	Constricted Pupils	3 NA Kits (If 3 NA Kits are used, administer 1st dose of available benzodiazepine)

	Clinical Findings	Signs/Symptoms	Required Conditions	NA Kits To Be Delivered
PEDIATRIC < 8 years of age	**Pediatric Patient with Non-Severe Signs/Symptoms**	• *Mild or moderate symptoms as above*	Threshold Symptoms *-and-* Positive evidence of nerve agent or OPP on site Medical Control Order	1 NA Kit
	Pediatric Patient with Severe Signs/Symptoms	• Constricted pupils • Unconsciousness • Seizures • Severe difficulty breathing	Severe breathing difficulty Weakness	1 NA Kit

Used in the Following Protocols
Crashing Adult/Impending Arrest (Section 3 Adult Treatment)
Bradycardia (Section 5 Adult Cardiac)
Pediatric Bradycardia (Section 6 Pediatric Cardiac)
Nerve Agent/Organophosphate Pesticide Exposure (Section 10 Special Operations)

Calcium Chloride

Pharmacological Category: Calcium Salt; Electrolyte Supplement, Parenteral

Routes: IV/IO

Indications:
1. Cardiac arrest in the renal failure patient
2. Calcium channel blocker toxicity
3. Crush Injury with suspected hyperkalemia

Precautions:
1. Use with caution in patients on digoxin; hypercalcemia may precipitate cardiac arrhythmias.
2. Calcium chloride is not compatible with sodium bicarbonate, flush IV line between medications.

Expected effects:
1. Increased force of myocardial contraction
2. Rise in arterial pressure

Note: If given in a line that infiltrated, calcium chloride administration may cause skin sloughing.

Dosing: GENERAL CRUSH INJURY

Indication: Suspected hyperkalemia (peaked T waves, widened QRS, hypotension)

Adults administer:
1. Calcium chloride 1 gm slow IVP over 5 minutes

Pediatrics administer:
1. According to MI MEDIC cards
2. If MI MEDIC Cards are not available administer:
    a. Calcium chloride 20 mg/kg slow IVP over 5 minutes. Max dose 1 gm

Dosing: POISONING/OVERDOSE/ENVIRONMENTAL EXPOSURE

Indication: Symptomatic calcium channel blocker overdose

Adults administer:
1. Calcium chloride 1 gm IV

Pediatrics administer:
1. According to MI MEDIC Cards
2. If MI MEDIC Cards are not available administer:
    a. Calcium chloride 20 mg/kg IV. Max dose 1 gm.

Dosing: GENERAL CARDIAC ARREST (Adult)

Indication: known or highly suspected hyperkalemia (e.g., dialysis patient, EKG changes)

Adults administer:
1. Calcium chloride (10%) 1 gm/10 mL IV/IO

Dosing: PEDIATRIC CARDIAC ARREST

Indication: hyperkalemia (renal failure)

Pediatrics administer:
1. According to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Calcium chloride (10%) 20 mg/kg (0.2 mL/kg). Max single dose 1 gm

Used in the Following Protocols
General Crush Injury (Section 2 Trauma and Environmental)
Poisoning/Overdose/Environmental Exposure (Section 2 Trauma and Environmental)
General Cardiac Arrest (Section 5 Adult Cardiac)
Pediatric Cardiac Arrest – General (Section 6 Pediatric Cardiac)

Cefazolin

Pharmacological Category: Antibiotic, Cephalosporin (First Generation)

Routes: IV/IO

Indications:
1. **Open fractures**
2. Partial/complete amputations
3. Major soft tissue injures (e.g., mangled extremity)

Contraindications:
1. Infusion <7 years of age (volume for infusion is larger than allowable fluid bolus).

Notes:
Slow IV push dilution of cefazolin
1. Dilute 2 gm cefazolin with 20 mL NS
   a. Inject two 10 mL flushes into one 2 gm vial of cefazolin
      OR
   b. Inject one 10 mL flush into each 1 gm vial of cefazolin.
2. Resulting concentration is 100 mg/mL

Infusion dilution of cefazolin
1. Add cefazolin dosage (slow IV push dilution) to 100 mL bag of NS
   a. Adults: add 20 mL (2 gm diluted) to 100 mL bag of NS
   b. Pediatrics > 7 years of age: volume of diluted cefazolin added to 100 mL of NS will be calculated weight-based dosage.

Dosing: SOFT TISSUE AND ORTHOPEDIC INJURIES
Indication: Partial/complete amputation, major soft tissue injures (e.g., mangled extremity) and open fractures.
Adults administer:
1. Cefazolin 2 gm (slow IV push dilution), slow IVP over 3-5 minutes
   OR
2. Cefazolin Infusion: 2 gm (slow IV push dilution) added to a 100 mL bag of NS. Infuse over 15-30 minutes.

Pediatrics
1. Pediatrics slow IVP cefazolin administer:
   a. Cefazolin (slow IV push dilution) according to MI MEDIC cards.
      i. . If MI MEDIC cards are not available administer Cefazolin (slow IV push dilution) 30 mg/kg slow IVP over 3-5 minutes. Maximum dose 2 gm.
      OR
   2. Pediatrics ≥ 7 years of age infusion of cefazolin administer:

a. Cefazolin infusion according to MI MEDIC cards
   a. If MI MEDIC cards are not available administer cefazolin (slow IV push dilution) 30 mg/kg added to 100 mL bag of NS. Max dose 2 gms. Infuse over 15-30 minutes.

Used in the Following Protocols
Soft Tissue and Orthopedic Injuries (Section 2 Trauma and Environmental)

Ceftriaxone

Pharmacological Category: Antibiotic, Cephalosporin (Third Generation)

Indications:
1. Open fractures
2. Partial/complete amputations
3. Major soft tissue injuries (e.g., mangled extremity).

Contraindications:
1. Patients ≤ 2 months old (any administration of ceftriaxone)
2. Infusion <7 years of age (volume for infusion is larger than allowable fluid bolus).
3. Allergies to cefepime (Maxipime) or cefotaxime (Claforan)

Side effects:
1. Rapid administration can result in tachycardia, restlessness, diaphoresis, and palpitations, pain at injection site.

Notes:
Slow IV push dilution of ceftriaxone
1. Dilute 2 gm ceftriaxone with 20 mL NS:
    a. Inject two 10 mL flushes into one 2 gm vial of ceftriaxone
    OR
    b. Inject one 10 mL flush into each 1 gm vial of ceftriaxone.
2. Resulting concentration is 100 mg/mL

Infusion dilution of ceftriaxone
1. Add ceftriaxone dosage (slow IV push dilution) to 100 mL bag of NS:
    a. Adults: add 20 mL (2 gm of slow IV push dilution) to 100 mL bag of NS
    b. Pediatrics > 7 years of age: volume of diluted ceftriaxone added to 100 mL bag of NS will be calculated weight-based dosage.

Dosing: SOFT TISSUE AND ORTHOPEDIC INJURIES
Indication: Partial/complete amputations, major soft tissue injuries (e.g., mangled extremity) and open fractures.
Adults administer:
1. Ceftriaxone Slow IVP: 2gm (slow IV push dilution), slow IVP over 3-5 minutes
    OR
2. Ceftriaxone Infusion: 2gm (slow IV push dilution) added to a 100 mL bag of NS. Infuse over 15-30 minutes.

Pediatrics
1. Pediatrics > 2 months old ceftriaxone slow IV push administer:
    a. Ceftriaxone (slow IV push dilution) according to MI MEDIC cards.

ii. If MI MEDIC cards are not available administer ceftriaxone (slow IV push dilution) 50 mg/kg slow IVP over 3-5 minutes. Maximum dose 2 gm.

OR

2. Pediatrics ≥ 7 years of age ceftriaxone infusion administer:

a. Ceftriaxone infusion according to MI MEDIC cards

i. If MI MEDIC cards are not available administer ceftriaxone (slow IV push dilution) 50 mg/kg added to 100 mL bag of NS. Max dose 2 gm. Infuse over 15-30 minutes.

Used in the Following Protocol(s):

Soft Tissue and Orthopedic Injuries (Section 2 Trauma and Environmental)

Dextrose

Pharmacological Category: Glucose-Elevating Agent

Routes: IV/IO

Indications:
1. Hypoglycemia
2. Altered mental status

Precautions:
1. Ensure patent line, extravasation may cause significant tissue damage.
2. Dextrose should be pushed slowly (e.g., over 1-2 minutes).

Expected effects:
1. Increased blood glucose level
2. Improvement in altered mental status.

Notes:
1. Instructions for diluting dextrose
    a. To obtain dextrose 10%, discard 40 mL out of one amp of D50, then draw up 40 mL of NS into the D50 ampule.
    b. To obtain dextrose 12.5%, discard 37.5 mL out of one amp of D50, then draw 37.5 mL of NS into the D50 ampule
    c. To obtain dextrose 25%, discard 25 mL out of one amp of D50, then draw 25 mL of NS into the D50 ampule
2. May utilize 10% for all ages 5 mL/kg (0.5 gm/kg) up to 250 mL

Dosing: ADULT ALTERED MENTAL STATUS
Indication: Patient is demonstrating signs of hypoglycemia, blood glucose is < 60 mg/dL.
Adults administer:
1. Dextrose 25 gm IV, titrate to fully awake and oriented.

Dosing: ADULT SEIZURES
Indication: Seizure patient with blood glucose < 60 mg/dL
Adults administer:
1. Dextrose 25 gm IV

Dosing: PEDIATRIC ALTERED MENTAL STATUS
Indication: Patient is demonstrating signs of hypoglycemia and blood glucose as follows:
1. 2 months old or younger and blood glucose is <40 mg/dL
2. 3 months old or older and blood glucose is <60 mg/dL

Pediatrics administer:
1. Dextrose according to MI MEDIC cards

2. If MI MEDIC cards are not available use chart below:

Dosing: PEDIATRIC SEIZURES
Indication: Pediatric seizure patient and blood glucose as follows:
1. 2 months old or younger and glucose is <40 mg/dL
2. 3 months old or older and glucose is <60 mg/dL

Pediatrics administer:
1. Dextrose according to MI MEDIC cards
2. If MI MEDIC cards are not available utilize the chart below.

Dosing: PEDIATRIC CARDIAC ARREST
Indication: Pediatric patients in cardiac arrest with a blood glucose is less than 60 mg/dL
Pediatrics administer:
1. Dextrose according to MI MEDIC cards
2. If MI MEDIC cards are not available utilize the chart below.
3. If chart is not available administer dextrose 0.5 g/kg

Color	Age	Weight	Dose	Concentration	Volume		Concentration	Volume
Grey	0-2 months	3-5 kg (6-11 lbs.)	2.5g	Dextrose 12.5%	20 mL	**OR**	Dextrose 10%	25 mL
Pink	3-6 months	6-7 kg (13-16 lbs.)	3.25g	Dextrose 25%	13 mL	**OR**	Dextrose 10%	33 mL
Red	7-10 months	8-9 kg (17-20 lbs.)	4.25g	Dextrose 25%	17 mL	**OR**	Dextrose 10%	43 mL
Purple	11-18 months	10-11 kg (21-25 lbs.)	5g	Dextrose 25%	20 mL	**OR**	Dextrose 10%	50 mL
Yellow	19-35 months	12-14 kg (26-31 lbs.)	6.25g	Dextrose 25%	25 mL	**OR**	Dextrose 10%	63 mL
White	3-4 years	15-18 kg (32-40 lbs.)	8g	Dextrose 25%	32 mL	**OR**	Dextrose 10%	80 mL
Blue	5-6 years	19-23 kg (41-50 lbs.)	10g	Dextrose 25%	40 mL	**OR**	Dextrose 10%	100 mL
Orange	7-9 years	24-29 kg (52-64 lbs.)	12.5g	Dextrose 50%	25 mL	**OR**	Dextrose 10%	125 mL
Green	10-14 Years	30-36 kg (65-79 lbs.)	15g	Dextrose 50%	40 mL	**OR**	Dextrose 10%	150 mL

Used in the Following Protocols
Altered Mental Status (Section 3 Adult Treatment)
Seizures (Section 3 Adult Treatment)
Pediatric Altered Mental Status (Section 4 Obstetrics and Pediatrics)
Pediatric Seizures (Section 4 Obstetrics and Pediatrics)

Pediatric Cardiac Arrest – General (Section 6 Pediatric Cardiac)

Diazepam

Pharmacological Category: Antiseizure Agent, Benzodiazepine

Routes: IV/IO

Indications:
1. Procedural sedation

Precautions:
1. Respiratory depression
2. Hypotension

Expected effects:
1. Skeletal muscle relaxation

Notes:
1. Not used for pediatric procedural sedation

Dosing: PROCEDURAL SEDATION
Indication: Procedural sedation
Adults administer:
1. Diazepam 5-10 mg (0.1 mg/kg) IV/IO titrated slowly. May repeat every 5 minutes to a maximum of 0.3 mg/kg.

Used in the Following Protocols
Patient Procedure Sedation (Section 7 Procedures)

Diltiazem

Pharmacological Category: Antiarrhythmic Agent, Calcium Channel Blocker

Routes: IV/IO

Indications:
1. Symptomatic Tachycardia: Narrow Complex (Regular and Narrow or Irregular and Narrow rhythms)

Contraindications:
1. Patients with diagnosed sinus node dysfunction (e.g., sick sinus syndrome, WPW syndrome) unless pacemaker is present and functioning.
2. Patients with diagnosed or observed high-grade AV block (i.e., 2nd or 3rd degree heart block) unless pacemaker is present and functioning.

Precautions:
1. Be prepared to administer fluid bolus

Expected effects:
1. Resolution of rapid ventricular response or return to NSR

Side effects:
1. Hypotension

Dosing: ADULT TACHYCARDIA
Indication: Regular Narrow Complex Tachycardia (i.e., SVT, A-Flutter) and Irregular Narrow Complex Tachycardia (i.e., A-Fib/A-Flutter)
Adults administer:
1. Diltiazem 15-20 mg (0.25 mg/kg) IV slowly

Used in the Following Protocols
Tachycardia (Section 5 – Adult Cardiac)

Diphenhydramine

Pharmacological Category: Histamine H1 Antagonist

Routes: IV/IO/IM

Indications:
1. Anaphylaxis
2. Mild or moderate allergic reaction
3. Urticaria/hives
4. Nausea and vomiting

Expected effects:
1. Antihistamine, decreased urticarial, decreased itching
2. Drowsiness

Dosing: NAUSEA AND VOMITING
Indications: Nausea and vomiting
Adults administer:
1. Diphenhydramine 12.5-25 mg IV/IM. Maximum dose 25 mg.

Pediatric (>2 years of age AND > 12 kg) administer:
1. According to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Diphenhydramine 1.0 mg/kg IV. Max dose 25 mg.

Dosing: ANAPHYLAXIS ALLERGIC REACTION
Indication: Anaphylaxis/allergic reaction
Adults administer:
1. Diphenhydramine 50 mg IM/IV/IO

Pediatrics administer:
1. According to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Diphenhydramine 1 mg/kg IM/IV/IO. Maximum dose 50 mg.

Dosing: POISONING/OVERDOSE/ENVIRONMENTAL EXPOSURE
Indication: extrapyramidal dystonic reactions
Adults administer:
1. Diphenhydramine 50 mg IV.

Pediatrics administer:
1. Diphenhydramine 1 mg/kg IV. Max dose 50 mg.

Used in the Following Protocols

Nausea & Vomiting (Section 1 General Treatment)
Anaphylaxis/Allergic Reaction (Section 1 General Treatment)
Poisoning/Overdose/Environmental Exposure (Section 2 Trauma and Environmental)

Epinephrine

Pharmacological Category: Sympathomimetic agent

Routes: IV/IO/IM, Nebulized

Indications:
1. Anaphylaxis
2. Bradycardia
3. Respiratory distress
4. Hypotension
5. Cardiac arrest

Expected effects:
1. Decreased wheezing
2. Increased BP
3. Increased HR

Notes:
1. This protocol does NOT apply to Epi Auto Injector (see Epi Auto Injector Protocol)
2. Note that epinephrine is not utilized in the pediatric bradycardia protocol

Preparing PUSH DOSE Epinephrine:
1. Prepare (epinephrine 10 mcg/mL)
    a. Combine 1 mL of 1 mg/10 mL epinephrine in 9mL NS

Dosing: SHOCK
Indication: Hypotension unresponsive to fluid bolus administration
Adults administer:
1. PUSH DOSE epinephrine 10-20 mcg (1-2 mL of 10 mcg/mL) IV/IO. Repeat every 3-5 minutes. Titrate to SBP > 90 mm/Hg.

Pediatrics administer:
1. PUSH DOSE epinephrine utilizing MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. PUSH DOSE epinephrine 1 mcg/kg (0.1 mL of epinephrine 10 mcg/mL) IV/IO. Maximum single dose 10 mcg (1 mL). Repeat every 3-5 minutes.

Dosing: ANAPHYLAXIS/ALLERGIC REACTION
Indication: Anaphylaxis/Severe Allergic Reaction
Adults administer:
1. Epinephrine (1mg/mL) 0.3 mg (0.3 mL) IM. May repeat one time after 3-5 minutes if patient remains hypotensive. Maxiumum of 2 doses total of epinephrine (including

epi pen).

Pediatrics administer EPI IM:

1. EPI IM according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. For child weighing ≤ 30 kg or approx. 60 lbs.
        i. Epinephrine (1mg/mL) 0.15 mg (0.15 mL) IM. May repeat one time after 3-5 minutes if patient remains hypotensive. Maxiumum of two IM doses (including epi pen).
    b. For child weighing > 30 kg or approx. 60 lbs.
        i. Epinephrine (1mg/mL) 0.3 mg (0.3 mL) IM. May repeat one time after 3-5 minutes if patient remains hypotensive. Maxiumum of two IM doses total (including epi pen).

Indication: Hypotension not responsive to fluid bolus administration and/or impending arrest

Adults administer:

1. PUSH DOSE epinephrine 10-20 mcg (1-2 mL of 10 mcg/mL) IV/IO. Repeat every 3-5 minutes. Titrate to SBP > 90 mm/Hg.

Pediatrics administer:

1. PUSH DOSE epinephrine utilizing MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. PUSH DOSE epinephrine 1 mcg/kg (0.1 mL of epinephrine 10 mcg/mL) IV/IO. Maximum single dose 10 mcg (1 mL). Repeat every 3-5 minutes.

Dosing: ADULT RESPIRATORY DISTRESS

Indication: Impending respiratory failure and unable to tolerate nebulizer therapy

Adults administer EPI IM:

1. Epinephrine (1mg/mL) 0.3 mg (0.3 mL) IM

Dosing: CRASHING ADULT/IMPENDING ARREST

Indication: Patient in whom cardiac or respiratory arrest appears imminent and hypotension is unresponsive to fluid bolus administration

Adults administer:

1. PUSH DOSE epinephrine 10-20 mcg (1-2 mL of 10 mcg/mL) IV/IO. Repeat every 3-5 minutes. Titrate to SBP > 90 mm/Hg.

Dosing: PEDIATRIC RESPIRATORY DISTRESS, FAILURE OR ARREST
Indication: Pediatric patient presents with stridor at rest without suspected airway obstruction.
Pediatrics administer EPI IM:

1. EPI IM according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Child weighing ≤ 30 kg or approx. 60 lbs.:
        i. Epinephrine (1 mg/mL) 0.15 mg (0.15 mL) IM
    b. Child weighing > 30 kg or approx. 60 lbs.
        i. Epinephrine (1 mg/mL) 0.3 mg (0.3 mL) IM

Indication: Severe respiratory distress
Pediatrics administer NEBULIZED EPI

1. Epinephrine (1 mg/1 mL) 5 mg nebulized

Dosing: ADULT CARDIAC ARREST
Indication: Cardiac arrest
Adults administer:

1. Epinephrine (1 mg/10 mL) 1 mg IV/IO every 3 to 5 minutes

Dosing: PEDIATRIC CARDIAC ARREST
Indication: Cardiac arrest
Pediatrics administer:

1. Epinephrine according to MI MEDIC cards.
2. If MI MEDIC cards are not available administer.
    a. Epinephrine (1 mg/10 ml), 0.01 mg/kg (0.1 ml/kg). Max dose 1 mg (10 mL). Repeat every 3-5 minutes

Dosing: ADULT BRADYCARDIA
Indication: Patients with persistent symptomatic bradycardia
Adults administer:

1. PUSH DOSE epinephrine 10-20 mcg (1-2 mL of 10 mcg/mL) IV/IO. Repeat every 3-5 minutes. Titrate to SBP > 90 mm/Hg.

Dosing: ADULT CHF/CARDIOGENIC SHOCK
Indication: If SBP is below 100 mmHG treat for cardiogenic shock
Adults administer:

1. PUSH DOSE epinephrine 10-20 mcg (1-2 mL of 10 mcg/mL) IV/IO. Repeat every 3-5 minutes. Titrate to SBP > 90 mm/Hg.

Dosing: ADULT ROSC
Indication: Hypotension unresponsive to fluid bolus administration
Adults administer:

1. PUSH DOSE epinephrine 10-20 mcg (1-2 mL of 10 mcg/mL) IV/IO. Repeat every 3-5 minutes. Titrate to SBP > 90 mm/Hg.

Dosing: PEDIATRIC BRADYCARDIA
Indication: If pulse remains < 60, despite oxygenation & ventilation
Pediatrics administer:

1. Epinephrine according to MI MEDIC cards.
2. If MI MEDIC cards are not available administer:
   a. Epinephrine (1 mg/10 mL) 0.01 mg/kg (0.1 mL/kg) IV/IO up to 1 mg (10 mL). Repeat every 3-5 minutes.

Dosing: PEDIATRIC ROSC
Indication: Hypotension unresponsive to fluid bolus administration
Pediatrics administer:

1. PUSH DOSE epinephrine according to MI MEDIC cards, titrating to age appropriate SBP per MI MEDIC cards.
2. If MI MEDIC cards are not available administer:
   a. PUSH DOSE epinephrine 1 mcg/kg (0.1 mL of epinephrine 10 mcg/mL) IV/IO. Maximum single dose 10 mcg (1 mL). Repeat every 3-5 minutes. Titrate to SBP > 70 mmHG + (2 x age in years) up to 100 mmHg.

Used in the Following Protocols
Shock (Section 1 General Treatment)
Anaphylaxis/Allergic Reaction (Section 1 General Treatment)
Respiratory Distress (Section 3 Adult Treatment)
Crashing Adult/Impending Arrest (Section 3 Adult Treatment)
Pediatric Respiratory Distress, Failure or Arrest (Section 4 Obstetrics and Pediatrics)
General Cardiac Arrest (Section 5 Adult Cardiac)
Pediatric Cardiac Arrest – General (Section 6 Pediatric Cardiac)
Bradycardia (Section 5 Adult Cardiac)
Pulmonary Edema/Cardiogenic Shock (Section 5 Adult Cardiac)
Pediatric Bradycardia (Section 6 Pediatric Cardiac)
Return of Spontaneous Circulation (ROSC)-Adult (Section 3 Adult Treatment)
Peds ROSC (Section 4 Obstetrics and Pediatrics)

Fentanyl

Pharmacological Category: Analgesic, Opioid; General Anesthetic

Routes: IV/IO/IM/IN

Indications:
1. Pain management
2. Patient sedation

Contraindications:
1. Altered Mental Status
2. Hypotension
3. Respiratory Depression

Expected effects:
1. Decreased pain
2. Decreased agitation

Side effects:
1. Drowsiness
2. Hypotension
3. Respiratory Depression
4. Vomiting

Dosing: CHEST PAIN/ACUTE CORONARY SYNDROME
Indication: Chest pain in which nitroglycerin is contraindicated due to erectile dysfunction medication or suspected cardiac chest pain is refractory to nitroglycerin.
Adults (65 years of age or under) administer:

1. Fentanyl 1 mcg/kg IV/IO/IN, max single dose 100 mcg. May repeat one time. Total dose may not exceed 200 mcg.

Adults (> 65 years of age or older) administer:

1. Fentanyl 0.5 mcg/kg IV/IO/IN. Max single dose 50 mcg. May repeat three times. Total dose may not exceed 200 mcg.

Dosing: PAIN MANAGEMENT
Indication: Patient is unable to tolerate ketamine or ketamine is not available and the patient has significant pain (described as 7 or greater on the Wong Pain Scale).
Adults 65 years of age or under administer:

1. Fentanyl 1 mcg/kg IV/IO/IN. Max single dose 100 mcg. May repeat one time. Total dose may not exceed 200 mcg.

Adults > 65 years of age administer:

1. Fentanyl 0.5 mcg/kg IV/IO/IN. Max single dose 50 mcg. May repeat three times. Total dose may not exceed 200 mcg.

Pediatrics administer:

1. Fentanyl according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Fentanyl 0.1 mg/kg IV/IO/IN

Dosing: PATIENT PROCEDURAL SEDATION

Adults administer:

1. Fentanyl 50-100 mcg (1 mcg/kg) IV/IO titrated slowly (IN, if available). May repeat every 4 minutes to a maximum of 3 mcg/kg.

Pediatrics administer:

1. Fentanyl according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Fentanyl 1 mcg/kg IV/IO titrated slowly (IN, if available). May repeat every 5 minutes to a maximum of 3 mcg/kg.

Used in the Following Protocols

Chest Pain/Acute Coronary Syndrome (Section 5 Adult Cardiac)
Pain Management (Section 7 Procedures)
Patient Procedure Sedation (Section 7 Procedures)

Glucagon

Pharmacological Category: Antidote; Hypoglycemia

Routes: IM/IN

Indications:
1. Unable to obtain IV access and dextrose is indicated

Contraindications:
1. Adrenal gland tumor

Expected effects:
1. Increased blood glucose

Side effects:
1. Nausea
2. Vomiting

Dosing: ADULT ALTERED MENTAL STATUS
Indication: Patient is demonstrating signs of hypoglycemia, blood glucose is < 60 mg/dL and unable to start IV.
Adults administer:
1. Glucagon 1 mg IM/IN

Dosing: ADULT SEIZURE
Indication: Seizure patient with blood glucose < 60 mg/dL and unable to start IV.
Adults administer:
1. Glucagon 1 mg IM/IN

Dosing: PEDS ALTERED MENTAL STATUS
Indication: Pediatric patient demonstrating signs of hypoglycemia, unable to start IV and blood glucose as follows:
1. 2 months old or younger and glucose is <40 mg/dL
2. 3 months old or older and glucose is <60 mg/dL

Pediatrics administer:
1. Glucagon according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
   a. Pediatrics age 5 or greater:
      i. Glucagon 1 mg IM/IN
   b. Pediatrics less than age 5:
      i. Glucagon 0.5 mg IM/IN

Dosing: PEDS SEIZURE

Indication: Pediatric seizure patient, unable to start IV, and blood glucose as follows:

1. 2 months old or younger and glucose is <40 mg/dL
2. 3 months old or older and glucose is <60 mg/dL

Pediatrics administer:

1. Glucagon according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Pediatrics age 5 or greater:
        i. Glucagon 1 mg IM/IN
    b. Pediatrics less than age 5:
        i. Glucagon 0.5 mg IM/IN

Used in the Following Protocols

Altered Mental Status (Section 3 Adult Treatment)
Seizures (Section 3 Adult Treatment)
Pediatric Altered Mental Status (Section 4 Obstetrics and Pediatrics)
Pediatric Seizures (Section 4 Obstetrics and Pediatrics)

Hydroxocobalamin

Pharmacological Category: Antidote; Vitamin, Water Soluble

Routes: IV/IO

Indications:
1. Known or suspected cyanide poisoning.
2. Smoke inhalation with altered mental status and/or moderate to severe respiratory distress.

Precautions:
1. Numerous drugs and blood products are not compatible with hydroxocobalamin.
2. Push over 15 minutes
3. Hydroxocobalamin is incompatible with dopamine and fentanyl. Must flush line between medications.

Expected effects:
1. Increased blood glucose

Side effects:
1. Nausea
2. Vomiting
3. Abdominal pain
4. Red colored urine, skin, mucus membranes
5. Rash

Notes:
1. Hydroxocobalamin comes as a powder to be reconstituted prior to administration and is available as Cyanokit®
2. Reconstitute Cyanokit® (5 gm or 2.5 gm vial) for injection using sterile transfer spike with diluent (0.9%NaCl).
    a. The line on each vial label represents the volume of diluent
    b. Repeatedly inverted or rock vial (do not shake) prior to infusion
        i. 5 gm bottle invert/rock for at least 60 seconds
        ii. 2.5 gm bottle invert/rock for at least 30 seconds
    c. Visually inspect solution - should be dark red with no particulates
        i. Discard if visible particulates and/or not dark red

Dosing: CYANIDE EXPOSURE

Indication: Patients exposed to cyanide that demonstrate symptoms as outlined in the above protocol.

Adults administer:

1. Hydroxocobalamin 5 gm IV/IO slow IV push over 15 minutes. May repeat 5 gm dose infusion. Infuse over 15 minutes for sever cases, slower infusion, up to 2 hours, for less severe cases. Total max dose 10 gm.

Pediatrics administer:

1. Hydroxocobalamin according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Hydroxocobalamin according to chart below
    b. If chart below is not available administer Hydroxocobalamin 70 mg/kg IV/IO slow IV push over 15 minutes.

Cyanokit® Administration for Suspected Cyanide Poisoning (including serious smoke inhalation)

Weight	Age	Cyanokit® Dose[1] (~70 mg/kg +/-) IV/IO	Cyanokit® Volume to Administer[2] IV/IO
3-5 kg (6-11 lbs)	**0-2 months**	250 mg	**10 mL[3]**
6-7 kg (13-16 lbs)	**3-6 months**	500 mg	**20 mL[3]**
8-9 kg (17-20 lbs)	**7-10 months**	625 mg	**25 mL[3]**
10-11 (21-25 lbs)	**11-18 months**	750 mg	**30 mL[3]**
12-14 kg (26-31 lbs)	**19-35 months**	900 mg	**36 mL[3]**
15-18 kg (32-40 lbs)	**3-4 years**	1100 mg	**44 mL[3]**
19-23 kg (41-51)	**5-6 years**	1500 mg	**60 mL[3]**
24-29 kg (52-64)	**7-9 years**	1750 mg	**70 mL[3]**
30-36 kg (65-79 lbs)	**10-14 years**	2500 mg	**100 mL[4] (1/2 bottle)**
Adult 37 40 kg (80-88 lbs)	**>14 years**	3000 mg	**120 mL[4]**
Adult 41 49kg (89-108 lbs)	**>14 years**	3500 mg	**140 mL[4]**
Adult > or 50 kg (> or 109 lbs)	**>14 years**	5000 mg	**200 mL[4] (full bottle)**

[1]The safety and efficacy in pediatrics has not been established, [2]Administer slowly over 15 minutes.
[3]Push slowly over 15 minutes, [4]Infuse over 15 minutes

Used in the Following Protocols

Cyanide Exposure (Section 10 Special Operations)

MCA Name Calhoun County MCA
MCA Board Approval 12/7/23
MCA Implementation Date 2/1/24
MDHHS Approval: 7/19/23

Ibuprofen

Pharmacological Category: Analgesic, Nonopioid; Nonsteroidal Anti-inflammatory Drug (NSAID)

Routes: PO

Indications:
1. Mild pain
2. Fever

Contraindications:
1. Active bleeding
2. <6 months of age
3. Pregnancy

Precautions:
1. Has received ibuprofen (I.e., Motrin/Advil) or any medication containing ibuprofen (e.g., cold medication) in the last 6 hours and is alert.
2. Patient must be alert enough to take PO medication.

Expected effects:
1. Fever reduction
2. Pain relief

Side effects:
1. Nausea/vomiting
2. Abdominal pain
3. Heartburn

Dosing: PEDIATRIC FEVER
Indication: Fever
Pediatrics over 6 months old administer:
1. Ibuprofen according to MI MEDIC cards
    a. If MI MEDIC cards are not available administer ibuprofen according to dosing chart below.

Dosing: PAIN MANAGEMENT
Indication: For mild to moderate pain (described as 1-6 on the Wong Pain Scale)
Adults administer:
1. Ibuprofen 400 mg PO.

Pediatrics (patients greater than 6 months of age) administer:
1. Ibuprofen according to MI MEDIC cards

2. If MI MEDIC cards are not available administer ibuprofen according to chart below

Children's Ibuprofen Elixir Dosing Table		
Child's Weight	Child's Age	**Ibuprofen** 100 mg/5mL
3-5 kg (6-12 lbs.)	0-2 mos.	DO NOT GIVE
6-7 kg (13-16 lbs.)	3-6 mos.	DO NOT GIVE
8-9 kg (17-20 lbs.)	7-10 mos.	4 mL (80 mg)
10-11 kg (21-25 lbs.)	11-18 mos.	5 mL (100 mg)
12-14 kg (26-31 lbs.)	19 mos.-35 mos.	6 mL (120 mg)
15-18 kg (32-40 lbs.)	3-4 yrs.	7.5 mL (150 mg)
19-23 kg (41-51 lbs.)	5-6 yrs.	9.5 mL (190 mg)
24-29 kg (52-64 lbs.)	7-9 yrs.	13 mL (260 mg)
30-36 kg (65-79 lbs.)	10-14 yrs.	15 mL (300 mg)

Used in the Following Protocols
Pediatric Fever (Section 4 Obstetrics and Pediatrics)
Pain Management (Section 7 Procedures)

Ipratropium Bromide

Pharmacological Category: Anticholinergic Agent

Routes: Nebulized

Indications:
1. Wheezing
2. Airway Constriction

Contraindications:
1. Hypersensitivity to atropine or its derivatives

Expected effects:
1. Decreased wheezing
2. Decreased respiratory distress

Notes: May be administered in conjunction with albuterol 2.5 mg/3 mL NS as a 'Duoneb'.

Side effects:
1. Palpitations
2. Dry Mouth
3. Anxiety

Dosing: ANAPHYLAXIS ALLERGIC REACTION
Indication: Continued wheezing and/or airway constriction after administration of nebulized albuterol.
Adults and pediatrics administer:
1. Ipratropium 500 mcg/2.5 mL NS nebulized

Dosing: ADULT RESPIRATORY DISTRESS
Indication: Continued wheezing and/or airway constriction after administration of nebulized albuterol.
Adults administer:
1. Ipratropium 500 mcg/2.5 mL NS nebulized

Used in the Following Protocols
Anaphylaxis/Allergic Reaction (Section 1 General Treatment)
Respiratory Distress (Section 3 Adult Treatment)

Ketamine

Pharmacological Category: Antidepressant; General Anesthetic

Routes: IV/IO/IM/IN

Indications:
1. Pain Management
2. Sedation

Precautions:
1. Ketamine IV should be diluted to prevent ketamine dissociation.

Expected effects:
1. Sedation
2. Decreased agitation
3. Decreased pain

Side effects:
1. Nausea/vomiting
2. Nystagmus
3. Dysphoria

Notes:
1. IM Ketamine has a 3–5-minute onset
2. Diluting ketamine
    a. Mix the patient specific dose into 100 mL NS and administer slow infusion over 5-10 minutes.
3. Ketamine is an MCA optional medication and may not be available.

Dosing: HYPERACTIVE DELIRIUM SYNDROME WITH SEVERE AGITATIONS

Indication: Patients demonstrating signs and symptoms of hyperactive delirium syndrome with severe agitation that are in imminent physical threat to themselves and/or personnel.

Adults administer:

1. Ketamine 4 mg/kg IM. Maximum single dose 500 mg

Dosing: PAIN MANGEMENT

Indication: For patients with severe pain (described as 7 or greater on the Wong Pain Scale)

Adults administer:

1. Ketamine 0.2 mg/kg IV/IO (diluted) slow infusion. Maximum single dose 25 mg.
2. Ketamine 0.5 mg/kg IN (undiluted). Maximum single dose 50 mg.
3. May repeat after 10 minutes.

Pediatrics

1. Ketamine according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Pediatrics (> 6 years of age and ≤ 14 years of age):
        i. Ketamine 0.2 mg/kg IV/IO (diluted) slow infusion, maximum single dose 7.2 mg
        ii. Ketamine 0.5 mg/kg IN (undiluted) maximum single dose 18 mg
        iii.. May repeat after 10 minutes.
    b. Pediatrics (> 6 months of age and ≤ 6 years of age)
        i. 0.5 mg/kg IN (undiluted) maximum single dose 18 mg
        ii.. May repeat after 10 minutes.

Used in the Following Protocols

Hyperactive Delirium Syndrome with Severe Agitation (Section 3 Adult Treatment)
Pain Management (Section 7 Procedures)

Ketorolac

Pharmacological Category: Analgesic, Nonopioid; Nonsteroidal Anti-inflammatory Drug (NSAID)

Routes: IM/IV

Indications:
1. Pain management

Contraindications:
1. Allergies to NSAIDs
2. Active labor or women who are breastfeeding
3. Renal impairment
4. Bleeding or high risk of bleeding
5. Pregnancy

Expected effects:
1. Pain Relief

Side effects:
1. Nausea/vomiting
2. Bloating

Dosing: PAIN MANAGEMENT
Adults administer:
1. Ketorolac 15 mg IM/IV

Pediatrics (patients over 5 years of age) administer:
1. Ketorolac according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Ketorolac 1 mg/kg IM/IV. Max dose 15 mg.

Used in the Following Protocols
Pain Management (Section 7 Procedures)

Lidocaine

Pharmacological Category: Antiarrhythmic, anesthetic

Routes: IV/IO

Indications:
1. Cardiac arrest from VF/VT
2. Wide complex tachycardia
3. As an anesthetic agent for IO establishment

Contraindications:
1. Bradycardia or heart block

Expected effects:
1. Increased VF threshold
2. Decreased ventricular irritability
3. Decreased pain with infusion

Dosing: ADULT CARDIAC ARREST
Indication: Cardiac arrest V-Fib, pulseless V-Tach, or multiple AED defibrillations
Adults administer:
1. Lidocaine 1 mg/kg IV/IO. May repeat 0.5 mg/kg every 5-10 minutes. Total dose of 3 mg/kg

Dosing: ADULT TACHYCARDIA
Indication: Regular Wide QRS rhythm (i.e., V-Tach, SVT/A-Flutter with aberrancy)
Adults administer:
1. Lidocaine 1 mg/kg IV. Repeat lidocaine 0.5 -1.0 mg/kg IV push every 5 - 10 minutes to a maximum of 3 mg/kg.

Dosing: PEDIATRIC CARDIAC ARREST
Indication: Cardiac arrest V-Fib, pulseless V-Tach, or multiple AED defibrillations
Pediatrics administer:
1. Lidocaine according to MI MEDIC cards
2. If MI MEDIC cards are not available administer Lidocaine 1 mg/kg IV/IO. May repeat 0.5 mg/kg twice at 5-10 minute intervals. Maximum 3 doses total

Dosing: PEDIATRIC TACHYCARDIA
Indication: For recurrent or refractory wide complex – unstable tachycardia
Pediatrics administer:
1. Lidocaine according to MI MEDIC cards
2. If MI MEDIC cards are not available administer Lidocaine 1 mg/kg IV/IO. May repeat 0.5 mg/kg twice at 5-10 minute intervals. Maximum 3 doses total

Dosing: VASCULAR ACCESS & IV FLUID THERAPY
Indication: Conscious patients experiencing pain with IO infusion
Adults administer:
1. Lidocaine 2%, 20 mg IO

Pediatrics administer:
1. Lidocaine 0.5 mg/kg, IO maximum dose of 20 mg

Used in the Following Protocols

General Cardiac Arrest (Section 5 Adult Cardiac)
Tachycardia (Section 5 Adult Cardiac)
Pediatric Cardiac Arrest – General (Section 6 Pediatric Cardiac)
Pediatric Tachycardia (Section 6 Pediatric Cardiac)
Vascular access & IV Fluid Therapy (Section 7 Procedures)

Magnesium Sulfate

Pharmacological Category: Antiseizure Agent, Electrolyte Supplement

Indications:
1. Cardiac: Torsades de Pointes
2. VF/VT in hypomagnesemia
3. Pre-eclampsia
4. Eclamptic seizures
5. Refractory status asthmaticus

Precautions:
1. Magnesium Sulfate is diluted for applications in these protocols

Expected effects:
1. Seizure cessation
2. Decreased respiratory distress

Side effects:
1. Respiratory depression
2. Hypotension
3. Asystole
4. Burning in IV site for conscious patients

Best Practice for Administering Magnesium Sulfate
1. Magnesium Sulfate dose added to 100 to 250 mL of NS and infusing over approximately 10 minutes.

Notes:
1. Magnesium Sulfate for Preeclampsia/Eclampsia can be administered prior, during, or up to 6 weeks post childbirth.
2. The dosing for preeclampsia and eclampsia are both 4 gm (see treatment protocol for pre/post radio requirements).

Dosing: ADULT RESPIRATORY DISTRESS
Indication: Status asthmaticus
Adults administer:
1. Magnesium Sulfate 2 gm slow IV (preferably added to 100-200 mL NS bag over 10 minutes).

Dosing: ADULT SEIZURES
Indication: Eclamptic seizure
Adults administer:

1. Magnesium Sulfate 4 gm over 10 minutes IV/IO until seizure stops (preferably added to 100-200 mL NS bag over 10 minutes).

Dosing: CHILDBIRTH & RELATED OBSTETRICAL EMERGENCIES
Indication: Preeclampsia or Eclamptic Seizure
Adults administer:

1. Magnesium Sulfate 4 gm over 10 minutes IV/IO until seizure stops (preferably added to 100-200 mL NS bag over 10 minutes).

Dosing: ADULT CARDIAC ARREST
Indications: Suspected torsades de pointes
Adults administer:

1. Magnesium Sulfate 2 gm IV/IO

Used in the Following Protocols:
Respiratory Distress (Section 3 Adult Treatment)
Seizures (Section 3 Adult Treatment)
Childbirth and Obstetrical Emergencies (Section 4 Obstetrics and Pediatrics)
General Cardiac Arrest (Section 5 Adult Cardiac)

Methylprednisolone

Pharmacological Category: Corticosteroid, Systemic

Routes: IV/IO/IM

Indications:
1. Allergic reactions
2. Airway inflammation
3. Reactive airway disease
4. Acute adrenal insufficiency

Contraindications:
1. Hypersensitivity to methylprednisolone (or similar)

Expected effects:
1. Decreased inflammation

Side effects:
1. Dizziness
2. Nausea/vomiting

Notes:
1. Prednisone PO is preferred over methylprednisolone for respiratory distress however prednisone it is not a required medication, and the PO tablet has restrictions (tablet cannot be cut, cannot be administered to children ≤ 6 years of age, cannot be administered to patient that is unable to safely take PO medication).

Dosing: ANAPHYLAXIS ALLERGIC REACTION
Indication: If patient is symptomatic of an allergic reaction but not in a severe allergic reaction or anaphylaxis OR after epinephrine administration
Adults administer:
1. Methylprednisolone 125 mg IV/IO/IM

Pediatrics administer:
1. Methylprednisolone according to MI MEDIC cards.
2. If MI MEDIC cards are not available administer Methylprednisolone 2 mg/kg IV/IO/IM. Maximum dose 125 mg.

Dosing: ADRENAL CRISIS
Indication: Patients with a known history of adrenal insufficiency, experiencing signs of crisis.
Adults administer:

1. Methylprednisolone 125 mg IV/IO/IM

Pediatrics administer:
1. Methylprednisolone according to MI MEDIC cards.

2. If MI MEDIC cards are not available administer Methylprednisolone 2 mg/kg IV/IO/IM. Maximum dose 125 mg

Dosing: ADULT RESPIRAOTRY DISTRESS
Indication: Respiratory distress patients with wheezing or diminished breath sounds due to asthma or COPD.
Adults administer:
1. Methylprednisolone 125 mg IV/IO/IM

Dosing: PEDIATRIC RESPIRATORY DISTRESS, FAILURE OR ARREST
Indication: Pediatric respiratory distress patients with suspected bronchospasm (wheezing)
Pediatrics administer:
1. Methylprednisolone according to MI MEDIC cards.
2. If MI MEDIC cards are not available administer Methylprednisolone 2 mg/kg IV/IO/IM. Maximum dose 125 mg

Used in the Following Protocols:
Anaphylaxis/Allergic Reaction (Section 1 General Treatment)
Adrenal Crisis (Section 1 General Treatment)
Respiratory Distress (Section 3 Adult Treatment)
Pediatric Respiratory Distress, Failure or Arrest (Section 4 Obstetrics and Pediatrics)

Midazolam

Pharmacological Category: Antiseizure Agent, Benzodiazepine; Benzodiazepine

Routes: IV/IO/IM/IN

Indications:
1. Adult or pediatric seizures
2. Procedural Sedation
3. Severe agitation that prohibits essential assessment and/or treatment

Contraindications:
1. Shock

Precautions:
1. Consider lower range of dosing for Geriatric patients

Expected effects:
1. Seizure cessation
2. Sedation

Side effects:
1. Respiratory depression
2. Hypotension

Dosing: ADULT SEIZURES
Indication: Actively seizing adult patient.
Adults administer:
1. Midazolam 10 mg IM prior to IV start
2. If IV established prior to the need for medication administration, midazolam 5 mg IV/IO
3. If seizure persists repeat midazolam 5mg IV/IO/IM/IN

Dosing: HYPERACTIVE DELIRIUM SYNDROME
Indication: Patients who are uncontrollably agitated despite de-escalation techniques
Adults administer:
1. Midazolam 10 mg IM/IN

Dosing: PEDIATRIC SEIZURES
Indication: Actively seizing pediatric patient.
Pediatrics administer:
1. Midazolam according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Midazolam 0.1 mg/kg IM, maximum individual dose 10 mg.

b. If IV established prior to the need for medication administration, administer midazolam 0.05 mg/kg IV/IO. Maximum single dose of 5 mg.
c. If seizures persisting 10 minutes after initial dose (and correction of low blood glucose if applicable) repeat midazolam one time
    i. Midazolam 0.1 mg/kg IM. Maximum single dose 10 mg
    OR
    ii. If IV available midazolam 0.05 mg/kg IV/IO maximum single dose of 5 mg.

Dosing: PATIENT RESTRAINT
Indication: when soft restraint placement alone would pose a safety risk or is ineffective in calming the patient
Adults administer:
1. Midazolam 0.1 mg/kg IM/IN. Maximum dose of 10 mg

Pediatrics administer:
1. Midazolam according to MI MEDIC cards
2. If MI MEDIC cards are not available administer Midazolam 0.1 mg/kg IM. Maximum single dose 5mg.

Dosing: PATIENT PROCEDURAL SEDATION
Indication: Sedation titrated to minimum amount necessary for patients requiring a painful medical procedure (i.e., cardioversion, transcutaneous pacing), post intubation sedation, CPAP, or HFNC.
Adults administer:
1. Midazolam 1-5 mg (maximum dose of 0.05 mg/kg) IV/IO titrated slowly or IN. May repeat once in 5 minutes. Maximum total dose 0.1 mg/kg. Titrate to minimum amount necessary.

Pediatrics administer:
1. Midazolam according to MI MEDIC cards
2. If MI MEDIC cards are not available administer Midazolam 0.05 mg/kg IV/IO titrated slowly or IN. May repeat once in 5 minutes to a maximum of 0.1 mg/kg. Titrate to minimum amount necessary.

Used in the Following Protocols:
Seizures (Section 3 Adult Treatment)
Hyperactive Delirium Syndrome (Section 3 Adult Treatment)
Pediatric Seizures (Section 4 Obstetrics and Pediatrics)
Patient Restraint (Section 7 Procedures)
Patient Procedure Sedation (Section 7 Procedures)

Morphine

Pharmacological Category: Analgesic, Opioid

Indications:
1. Pain

Routes: IV/IO/IM

Contraindications:
1. Hypotension
2. Children < 18 months old

Expected effects:
1. Decreased pain

Side effects:
1. Respiratory depression
2. Hypotension

Dosing: PAIN MANAGEMENT
Adults administer:
1. Morphine 0.1 mg/kg IV/IO. Maximum single dose 5 mg. May repeat three times. Total dose may not exceed 20 mg.

Pediatrics (patients > 18 months of age) administer:
1. Morphine according to MI MEDIC cards
2. When MI MEDIC cards are not available administer Morphine 0.1 mg/kg IV/IO. Maximum single dose 5 mg. May repeat three times. Total dose may not exceed 20 mg.

Used in the Following Protocol(s):
Pain Management (Section 7 Procedures)

Naloxone

Pharmacological Category: Antidote; Opioid Antagonist

Indications for administration:
1. Known opioid overdose WITH respiratory depression
2. Respiratory depression or arrest of unknown origin (per treatment protocol)

Precautions:
1. Rapid IV push may cause agitation.

Expected effects:
1. Increased mental status
2. Increased respiratory drive

Side effects:
1. Agitation
2. Nausea/vomiting

Dosing: OPIOID OVERDOSE TREATEMENT AND PREVENTION
Indication: Decreased level of consciousness associated with respiratory depression from Opioid Overdose
Adults administer:
1. Narcan® Nasal Spray 4 mg in one nostril. May repeat one time in 3-5 minutes in opposite nostril if effective respirations not restored.
   OR
2. Naloxone prefilled 2 mg/2 mL IN via Atomizer. Half dose in each nostril. May repeat one time in 3-5 minutes if effective respirations not restored.
   OR
3. Naloxone 2 mg IM or slow IV push titrating to improvement in respiratory status. IV naloxone may be repeated as needed every 3-5 minutes.

Pediatrics administer:
1. According to MI MEDIC cards administer naloxone prefilled 2 mg/2 mL IN via atomizer. Half dose each nostril.
2. If MI MEDIC cards are not available administer naloxone prefilled 2 mg/2 mL IN via atomizer. Half dose each nostril.
   a. Age 36 months/3 years of age or older: 2mL (2 mg)
   b. Age 19-35 months old: 1.5 mL (1.5 mg)
   c. Age 3-18 months old: 1 mL (1.0 mg)
   d. Age 0-2 months old: 0.5 mL (0.5 mg)
   OR

3. According to MI MEDIC cards administer naloxone IM or slow IV push titrating to improvement in respiratory status. IV naloxone may be repeated as needed every 3-5 minutes.
4. If MI MEDIC cards are not available administer Naloxone 0.1 mg/kg IM or slow IV push titrating to improvement in respiratory status. IV naloxone may be repeated as needed every 3-5 minutes

Dosing: ADULT CARDIAC ARREST
Indication: Adult cardiac arrest with known or highly suspected opioid overdose
Adults administer:

1. Naloxone 2 mg IV/IO or 2-4 mg IN

Used in the Following Protocols:
Opioid Overdose Treatment and Prevention (Section 1 General Treatment)
General Cardiac Arrest (Section 5 Adult Cardiac)

Nitroglycerin

Pharmacological Category: Antianginal Agent; Vasodilator

Routes: SL

Indications:
1. Cardiac pain
2. Pulmonary edema

Contraindications:
1. Use of erectile dysfunction medications in previous 48 hours.
2. Use of medication to treat pulmonary hypertension in previous 48 hours
3. BP < 120 mm Hg without IV access
4. BP < 100 mm Hg with IV access

Expected effects:
1. Decreased blood pressure
2. Relief of chest pain

Side effects:
1. Headache
2. Flushing
3. Hypotension

Dosing: PULMONARY EDEMA/CARDIOGENIC SHOCK
Indication: Pulmonary edema
Adults administer:
1. Nitroglycerin 0.4 mg SL (without IV access) maximum of 3 doses.
2. Nitroglycerin 0.4 mg SL (with IV access) every 3-5 minutes

Dosing: CHEST PAINE/ACUTE CORONARY SYNDROME
Indication: Cardiac chest pain
Adults administer:
1. Nitroglycerin 0.4 mg SL (without IV access) maximum of 3 doses.
2. Nitroglycerin 0.4 mg SL (with IV access) every 3-5 minutes

Used in the Following Protocols:
Pulmonary Edema/Cardiogenic Shock (Section 5 Adult Cardiac)
Chest Pain/Acute Coronary Syndrome (Section 5 Adult Cardiac)

Ondansetron

Pharmacological Category: Antiemetic

Indications:

1. Nausea and vomiting

Routes: IV/IM; ODT (for patients ≥ 30 kg)

Contraindications:

1. Patients with Phenylketonuria (PKU)

Precautions:

1. Do not administer ODT to patients that are actively vomiting

Expected effects:

1. Diminished nausea

Side effects:

1. Headache
2. Dry mouth
3. Drowsiness

Notes:

1. Orally Disintegrating Tablet (ODT) is an MCA optional medication and may not be available.

Dosing: NAUSEA & VOMITING

Indication: Nausea & vomiting

Adults administer:

1. Ondansetron ODT 4mg if not actively vomiting and ODT is available.
2. Ondansetron 4mg IV/IM if patient is actively vomiting, vomited post ODT administration, or ODT is not available.
3. May administer a second dose of ondansetron 4 mg (IV/IM only). Total dose (including ODT) not to exceed 8 mg.

Pediatrics administer:

1. Ondansetron according to MI MEDIC cards
2. If MI MEDIC cards are not available administer:
    a. Pediatrics ≥ 30 kg that is not actively vomiting and ODT is available administer:
        i. Ondansetron 4 mg ODT
    b. Pediatrics < 30 kg, or if the patient is actively vomiting, or if the patient vomited post OD administration, or ODT is not available, administer:
        i. Ondansetron 0.1 mg/kg IV/IM, maximum dose of 4 mg.
    c. May repeat ondansetron 0.1 mg/kg IV/IM, maximum dose of 4 mg. Total dose (including ODT) may not exceed 8 mg.

Used in the Following Protocol(s):
Nausea & Vomiting (Section 1 General Treatment)

Pralidoxime

Pharmacological Category: Cholinesterase reactivator

Routes: IV/IM

Indications:
1. Exposure to organophosphate or nerve agents

Expected effects:
1. Decrease in symptoms

Side effects:
1. Blurred vision
2. Headache
3. Dizziness
4. Nausea

Notes:
1. This medication may be part of a Nerve Agent (NA) Antidote kit.
2. When not part of an NA kit, 600 mg pralidoxime (along with 2 mg Atropine) will be administered in place of each NA kit that was to be administered.

Dosing: NERVE AGENT/ORGANOPHOSPHATE PESTICED ESPOSURE
Indication: Symptomatic nerve agent or organophosphate pesticide exposure when a NA Antidote Kt is not available.
Adults and Pediatrics administer:
1. Pralidoxime 600 mg IV/IM for every one (1) NA Kit as required on Chart below.

	Clinical Findings	Signs/Symptoms	Required Conditions	NA Kits To Be Delivered
SELF-RESCUE	**Threshold Symptoms**	• Dim vision • Increased tearing • Runny nose • Nausea/vomiting • Abdominal cramps • Shortness of breath	Threshold Symptoms *-and-* Positive evidence of nerve agent or OPP on site  Medical Control Order	1 NA Kit (self-rescue)
ADULT PATIENT > 8 years of age	**Mild Symptoms and Signs**	• Increased tearing • Increased salivation • Dim Vision • Runny nose • Sweating • Nausea/vomiting • Abdominal cramps • Diarrhea	 Medical Control Order	1 NA Kit
	Moderate Symptoms and Signs	• Constricted pupils • Difficulty breathing • Severe vomiting	Constricted Pupils	2 NA Kits
	Severe Signs	• Constricted pupils • Unconsciousness • Seizures • Severe difficulty breathing	Constricted Pupils	3 NA Kits (If 3 NA Kits are used, administer 1st dose of available benzodiazepine)

PEDIATRIC < 8 years of age	**Pediatric Patient with Non-Severe Signs/ Symptoms**	• *Mild or moderate symptoms as above*	Threshold Symptoms *-and-* Positive evidence of nerve agent or OPP on site Medical Control Order	1 NA Kit
	Pediatric Patient with Severe Signs/ Symptoms	• Constricted pupils • Unconsciousness • Seizures • Severe difficulty breathing	Severe breathing difficulty Weakness	1 NA Kit

Used in the Following Protocols
Nerve Agent/Organophosphate Pesticide Exposure (Section 10 Special Operations)

Prednisone

Pharmacological Category: Corticosteroid, Systemic

Routes: PO

Indications:
1. Allergic Reaction
2. Inflammatory respiratory issues

Contraindications:
1. Hypersensitivity to steroids
2. Known systemic fungal infections
3. Children ≤ 6 years of age
4. Inability to take PO medication

Expected effects:
1. Decreased inflammation

Side effects:
1. Retention of fluids

Notes:
1. Do not cut prednisone tablets

Dosing: ANAPHYLAXIS ALLERGIC REACTION
Indication: If patient is symptomatic of an allergic reaction but not in a severe allergic reaction or anaphylaxis OR after epinephrine administration.
Adults administer:
1. Prednisone tablet 50 mg PO

Pediatrics > 6 years of age administer:
1. Prednisone tablet 50 mg PO

Dosing: ADRENAL CRISIS
Indication: Patients with a known history of adrenal insufficiency, experiencing signs of crisis.
Adults administer:
1. Prednisone tablet 50 mg PO

Pediatrics > 6 years of age administer:
1. Prednisone tablet 50 mg PO

Dosing: ADULT RESPIRATORY DISTRESS
Indication: Respiratory distress patients with wheezing or diminished breath sounds due to asthma or COPD
Adults administer:

1. Prednisone tablet 50 mg PO

Dosing: PEDIATRIC RESPIRATORY DISTRESS, FAILURE, OR ARREST
Indication: Pediatric respiratory distress patients with suspected bronchospasm (wheezing)
Pediatrics > 6 years of age administer:

1. Prednisone tablet 50 mg PO

Used in the Following Protocols
Anaphylaxis/Allergic Reaction (Section 1 General Treatment)
Adrenal Crisis (Section 1 General Treatment)
Respiratory Distress (Section 3 Adult Treatment)
Pediatric Respiratory Distress, Failure or Arrest (Section 4 Obstetrics and Pediatrics)

Sodium Bicarbonate

Pharmacological Category: Alkalinizing Agent; Antacid; Electrolyte Supplement,

Indications:
1. Cardiac arrest in dialysis patient with suspected hyperkalemia
2. Symptomatic tricyclic antidepressant overdose
3. Acidosis related to crush injury
4. Hyperkalemia

Contraindications:
1. Severe pulmonary edema
2. Known Alkalosis

Precautions:
1. Must flush IV line between medications
    a. Calcium and epinephrine are not compatible with sodium bicarbonate
2. Administer slowly

Dosing: GENERAL CRUSH INJURY
Indication: If extrication is prolonged, and/or hyperkalemia is suspected.
Adults administer:
1. Sodium bicarbonate 100 mEq IVP prior to extrication. May repeat 50 mEq/hr IVPB or slow IVP

Pediatrics administer:
1. Sodium bicarbonate according to MI MEDIC cards
2. If MI MEDIC cards are not available administer Sodium bicarbonate 1 mEq/kg (max dose 50 mEq) IVP

Dosing: POSIONING/OVERDOSE/ENVIRONMENTAL EXPOSURE GENERAL CRUSH INJURY
Indication: symptomatic tricyclic antidepressant ingestions (tachycardia, wide complex QRS)
Adults administer:
1. Sodium bicarbonate 50 mEq IV. Repeat as needed

Pediatrics administer:
1. Sodium bicarbonate according to MI MEDIC cards.
2. If MI MEDIC cards are not available administer Sodium bicarbonate 1 mEq/kg IV. Repeat as needed

Dosing: ADULT CARDIAC ARREST
Indications: Cardiac arrest with known or highly suspected tricyclic antidepressant overdose or known or highly suspected hyperkalemia (e.g., dialysis patient, EKG changes)
Adults administer:

1. Sodium bicarbonate 1 mEq/kg IV/IO

Dosing: PEDIATRIC CARDIAC ARREST
Indication: Cardiac arrest with hyperkalemia (renal failure)
Pediatrics administer:
1. Sodium bicarbonate according to MI MEDIC cards
2. If MI MEDIC cards are not available administer Sodium bicarbonate 1 mEq/kg IV/IO

Used in the Following Protocols:
General Crush Injury (Section 2 Trauma and Environmental)
Poisoning/Overdose/Environmental Exposure (Section 2 Trauma and Environmental)
General Cardiac Arrest (Section 5 Adult Cardiac)
Pediatric Cardiac Arrest – General (Section 6 Pediatric Cardiac)

Racepinephrine

Pharmacological Category: Adrenergic Agonist Agent; Alpha-/Beta- Agonist; Vasoconstrictor

Routes: Nebulized

Indications:
1. Pediatric patients with stridor at rest without suspected airway obstruction.

Expected effects:
1. Respiratory difficulty and stridor resolves

Dosing: PEDIATRIC RESPIRATORY DISTRESS, FAILURE, OR ARREST
Indication: Pediatric patient presents with stridor at rest without suspected airway obstruction.
Pediatrics administer:
1. Racepinephrine 0.5 mL of 2.25% inhalation solution diluted with 3 mL of NS via nebulizer.

Used in the Following Protocol(s):
Pediatric Respiratory Distress, Failure or Arrest (Section 4 Obstetrics and Pediatrics)

Tetracaine

Pharmacological Category: Local Anesthetic; Local Anesthetic, Ophthalmic

Indications:
1. Eye pain relief related to chemical exposure and subsequent eye irrigation.

Contraindications:
1. Hypersensitivity to anesthetics
2. Large area application
3. Infants < 1 year old

Precautions:
1. Patient should not rub eyes after administration

Expected effects:
1. Numbing of eye

Side effects:
1. Burning
2. Irritation
3. Rash

Notes:
1. Tetracaine is an MCA optional medication and may not be available.

Dosing: POISONING/OVERDOSE/ENVIRONMENTAL EXPOSURE
Adults and Pediatrics administer:
1. Tetracaine, 1-2 drops per eye every 5 minutes, maximum of 5 doses

Dosing: CHEMICAL EXPOSURE
Adults and Pediatrics administer:
1. Tetracaine, 1-2 drops per eye every 5 minutes, maximum of 5 doses

Used in the Following Protocols:
Poisoning/Overdose/Environmental Exposure (Section 2 Trauma and Environmental)
Chemical Exposure (Section 10 Special Operations)

Tranexamic Acid

Pharmacological Category: Hemostatic Agent

Routes: IV/IO

Indications:
1. Massive uncontrolled hemorrhage internal or external

Contraindications:
1. Intracranial bleeding
2. ≤ 18 years of age
3. Injury time greater than 3 hours

Precautions:
1. Transport to hospital that will continue TXA
    a. TXA delivered in the field is FIRST DOSE
    a. NOT effective if a SECOND DOSE is not given at the appropriate time in the hospital
2. Ensure receiving facility is aware of exact time of first dose prior to arrival, upon arrival and that it is documented in the EPCR.
3. Do not delay transport for administration of TXA

Expected effects:
1. Reduction of blood loss

Notes:
1. Draw up and mix 1 gram of TXA into a 100 mL bag of normal saline
    a. Use a filter needle if the medication is supplied in an ampule.
    b. Apply pre-printed “TXA added” fluorescent-colored label to IV bag.
    c. Administer mixed medication via piggyback into IV/IO line over 10 minutes.

Dosing: HEMORRHAGIC SHOCK
Indication: Massive uncontrolled hemorrhage internal or external
Adults > 18 years if age administer:
1. TXA 1 gram diluted in 100 mL NS IV/IO piggyback NS

Used in the Following Protocol(s):
Hemorrhagic Shock (Section 2 Trauma and Environmental)

Verapamil

Pharmacological Category: Antianginal Agent: Antiarrhythmic Agent

Routes: IV

Indications:
1. Symptomatic Tachycardia: Narrow Complex (Regular and Narrow or Irregular and Narrow rhythms)

Contraindications:
1. Hypotension
2. Patient under the age of 1 year.

Expected effects:
1. Slower heart rate
2. Potential conversion to NSR

Side effects:
1. Hypotension
2. Bradycardia

Dosing: TACHYCARDIA (Adult)
Indication: Regular Narrow Complex Tachycardia (i.e., SVT, A-Flutter) and Irregular Narrow Complex Tachycardia (i.e., A-Fib/A-Flutter)
Adults administer:
1. Verapamil 5 mg IV

Used in the Following Protocols
Tachycardia (Section 5 Cardiac)