2022 STATE PROTOCOL REVIEW

COVER SHEET 6.2.22

The last revision and release for state protocols was 2017, although the process had begun in 2020, COVID-19 greatly impacted the resources needed to carry out the task. Each of the ten sections of protocols will be released for 60-day public comment on a staggered schedule throughout the spring and summer of 2022. The entire suite will be released for adoption upon conclusion of public comment and applicable revisions.

Sections released for public comment will include:

- Cover sheet including dates of recent past revisions and the date of QATF approval for the proposed version (or an indication that no revision was deemed necessary).
- A clean copy of the protocol followed by a track changes version (if revised).
- Public Comment Sheet with the deadline for comments and instructions for submission.

KEY

 EMT-Basic

 EMT-Specialist

 Paramedic

No Icon = all licensure levels

 Medical Control

 Pediatric

RELEASE SCHEDULE

Released	Due			Anticipated Release
		Section 1	General Treatment	TBD
		Section 2	Trauma and Environmental Emergencies	July 2022
		Section 3	Adult Treatment	TBD
		Section 4	Obstetrics and Pediatrics	June 13, 2022 – DUE August 15, 2022
4/25/2022	6/27/2022	Section 5	Adult Cardiac	
		Section 6	Pediatric Cardiac	June 13, 2022 – DUE August 15, 2022
		Section 7	Procedures	TBD
		Section 8	Systems	TBD
6/2/2022	8/5/2022	Section 9 Part A	Medications	
		Section 9 Part B	Medications	July 2022
6/2/2022	8/5/2022	Section 10	Special Operations (minus 4 still in review)	

2022 STATE PROTOCOL REVIEW

				Section 9: Medications	Proposed Version
Initial Date	**Recent Past Revisions**			**Table of Contents**	
	PART 1	**Released for Public Comment 6.2.22 - Comments Due 8.2.22**			
10/25/2017			9.1	Medication Administration	Revised 2022
10/25/2017			9.2	Medication Substitution	Revised 2022
10/25/2017			9.3	Medication Shortage	Revised 2022
11/15/2012	11/14/2017		9.4	Intranasal Medication Administration (Optional)	Revised 2022
9/1/2004	10/25/2017		9.5	Field Drug Box & IV Kits	Revised 2022
9/1/2004	10/25/2017		9.6	Pharmacy, Drug Box and IV Supply Exchange Procedure	Revised 2022
6/26/2020			9.6a	Naloxone Medication Kit Contents and Distribution Procedure	Revised 2022
5/31/2012	10/25/2017		9.7	Epinephrine Auto-Injector Procedure	Revised 2022
11/15/2012	10/25/2017		9.8	Nebulized Bronchodilators	Revised 2022
			9.9	**Naloxone Administration**	**Merged into 1.10**
10/25/2017			9.10	2 Pam Chloride/Duodote	NO REVISIONS
10/25/2017			9.11	Acetaminophen	Revised 2022
10/25/2017			9.12	Adenosine	NO REVISIONS
10/25/2017			9.13	Albuterol	Revised 2022
10/25/2017			9.14	Amiodarone	NO REVISIONS
10/25/2017			9.15	Aspirin	Revised 2022
10/25/2017			9.16	Atropine	Revised 2022
10/25/2017			9.17	Calcium Chloride	NO REVISIONS
6/30/2016	10/25/2017		9.18	Dextrose	Revised 2022
10/25/2017			9.19	Diazepam	NO REVISIONS
10/25/2017			9.20	Diphenhydramine	NO REVISIONS
			9.21	**Dopamine**	**REMOVED**
10/25/2017	12/19/2017	3/23/2018	9.22	Epinephrine	Will be released for public comment with PART 2
10/25/2017			9.23	Fentanyl	Revised 2022
10/25/2017			9.24	Glucagon	Revised 2022
11/15/2017			9.25	Hydromorphone	Revised 2022
10/25/2017			9.26	Hydroxocobalamin/Cyanokit	Revised 2022

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 (include indication)
      4. Right Route
      5. Right Time
      6. Right Documentation (include response)
   B. Following administration of controlled medications, EMS personnel shall follow their individual department's policy on the correct accounting, disposal, and restocking of these medications.

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.

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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.

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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:

1. Medications indicated in the primary protocol are not available.
2. No other medication is listed in primary protocols as accepted by the MCA for use.

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	Alternate A	Alternate B	Protocols
Atropine	Epinephrine 2-10 mcg/min infusion Pediatric 0.1 mcg/kg/min	Transcutaneous Pacing	**Bradycardia**
Amiodarone	Lidocaine 1-1.5 mg/kg IV Pediatric 1 mg/kg IV	Procainamide 20 mg/min, max 17 mg/kg IV/IO Pediatric 15 mg/kg IV/IO over 60 minutes	**Adult and Pediatric Cardiac Arrest – General** **Adult and Pediatric Tachycardia**
Calcium Chloride	Calcium Gluconate 20 ml of 10% solution administered over 1 to 2 minutes IV (adults only)		**Poisoning/Overdose** **Cardiac Arrest – General (Adult)**
Dextrose 50%, 50 ml	Dextrose 10%, 250 ml IV Pediatric Dextrose 10% 5 ml/kg IV	Glucagon 1 mg Pediatric 0.05 mg/kg, up to 1 mg IM	**Adult and Pediatric Altered Mental Status** **Adult and Pediatric Seizures**
Diphenhydramine	Famotidine 20 mg IV Pediatric 0.25 mg IV Or Ranitidine 50 mg IV	Hydroxyzine 50 mg IM Pediatric 0.1 mg/kg IM	**Allergic Reaction**

	Pediatric 0.1 mg/kg IV		
Lidocaine	Amiodarone: 1. For Recurrent VF/VT: Adults 300 mg IV/IO repeat 150 mg one time. Pediatrics 5 mg/kg IV 2. Wide complex Tach 150 mg x 2 PRN, pediatric 5 mg/kg IV	Procainamide 20 mg/min, max 17 mg/kg IV/IO Pediatric 15 mg/kg IV/IO over 60 minutes	**Adult and Pediatric Cardiac Arrest – General** **Adult and Pediatric Tachycardia**
Morphine	Fentanyl 1 mcg/kg	Hydromorphone 2 mg IV or IM Pediatric 0.05 mg/kg max dose 2 mg	**Pain Management**
Fentanyl	Morphine 4 mg IV/IO Pediatrics 0.1 mg/kg IV	Hydromorphone 2 mg IV or IM Pediatric 0.05 mg/kg max dose 2 mg	**Pain Management**
Midazolam (Versed)	Lorazepam 2 mg or 0.05 mg/kg IV May repeat to maximum 4 mg	Diazepam 5 mg IV Pediatric 0.1 mg/kg	**Adult and Pediatric Seizures** **Patient Procedure Sedation** **Excited Delirium**
Ondansetron (Zofran)	Promethazine 12.5 mg IM Pediatric 0.25 mg/kg IM	Compazine 10 mg Pediatric 0.1mg/ kg	**Nausea/Vomiting**
Diazepam (Valium)	Midazolam 5 mg IV Pediatrics 0.1 mg/kg	Lorazepam 2mg IV Pediatrics 0.1 mg/kg IV	**Adult Seizures**
Ketamine	Midazolam 5 mg IV Pediatrics 0.1 mg/kg	Fentanyl 1 mcg/kg	**Patient Sedation** **Excited Delirium**
Midazolam	Patient Sedation: Ketamine 0.2 mg/kg IV/IO slowly Excited Delirium Adults only 4 mg/kg IM	Lorazepam 2mg IV Pediatrics 0.1 mg/kg IV	**Patient Sedation** **Excited Delirium**
Epinephrine 1mg/10ml	**Epinephrine 1mg/1ml 30mL Vial** 1. Expel 1mL of normal saline from a 10mL syringe (pre-filled) 2. Instill 1mg(mL) of Epinephrine 1:1,000 from 30 mL vial in to pre-filled syringe 3. 30mL vials are to be single patient use only		

	Epinephrine 1mg/ml Ampule 1. Expel 1mL of normal saline from a 10mL syringe (pre-filled) 2. Instill 1mg(mL) of Epinephrine 1:1,000 from ampule in to pre-filled syringe

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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 MMS 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 MMS 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 MMS 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/MMS 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 the drug exchange coordinator, and receive 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. *(I.e. – Medication is typically in a carpuject but a vial is being substituted due to shortages of the carpuject version. An appropriately sized safety needle and syringe must be available within close proximity to the medication in order to facilitate administration. These supplies too may be removed when the proper medication concentration is returned to the bag/box.)*
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.

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)*
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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.***

Commented [KK(C1]: DW clarifying this language

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 MMS 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 MMS 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

Deleted: Each EMS Medication Management System (MMS),

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)
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E. A method for dissemination of information related to changes made to the MMS 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/MMS 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 the drug exchange coordinator, and receive 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. *(I.e. – Medication is typically in a carpuject but a vial is being substituted due to shortages of the carpuject version. An appropriately sized safety needle and syringe must be available within close proximity to the medication in order to facilitate administration. These supplies too may be removed when the proper medication concentration is returned to the bag/box.)*
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.

Intranasal Medication Administration (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.

Purpose: This optional procedure authorizes intranasal medication administration by paramedics (and other levels of licensure, for naloxone) using an FDA-approved atomizing device. This procedure authorizes the substitution of the intranasal route for other routes specified in individual protocols as approved for specific indications stated below by the local medical control authority.

Indications: In general, the intravenous route is preferred for medication administration. This procedure may be considered when IV access is unavailable and when a needleless delivery system is desired because of patient agitation, combativeness, or similar conditions that may pose a safety risk to personnel.

CHECK MCA APPROVED INDICATION
☐ Pain Management
☐ Altered Mental Status with Suspected Opiate Overdose
☐ Sedation
☐ Seizures

1. Select desired medication and determine dose (See Medication Table).
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.

Indication	Medication
Suspected Opiate Overdose	Naloxone (1mg/1mL)
Sedation/Seizures	Midazolam
Adult Pain Control	Fentanyl
Adult Pain Control/Sedation	Ketamine
Pediatric Pain Control	Fentanyl
Pediatric Sedation/Seizure	Midazolam
Pediatric Pain Control/Sedation	Ketamine

10. Dosing is outlined in each protocol.

Intranasal Medication Administration (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.

Purpose: This optional procedure authorizes intranasal medication administration by paramedics (and other levels of licensure, for naloxone) using an FDA-approved atomizing device. This procedure authorizes the substitution of the intranasal route for other routes specified in individual protocols as approved for specific indications stated below by the local medical control authority.

Indications: In general, the intravenous route is preferred for medication administration. This procedure may be considered when IV access is unavailable and when a needleless delivery system is desired because of patient agitation, combativeness, or similar conditions that may pose a safety risk to personnel.

CHECK MCA APPROVED INDICATION
☐ Pain Management
☐ Altered Mental Status with Suspected Opiate Overdose
☐ Sedation
☐ Seizures

1. Select desired medication and determine dose (See Medication Table).
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.
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Indication	Medication
Suspected Opiate Overdose	Naloxone (1mg/1mL)
Sedation/Seizures	Midazolam
Adult Pain Control	Fentanyl
Adult Pain Control/Sedation	Ketamine
Pediatric Pain Control	Fentanyl
Pediatric Sedation/Seizure	Midazolam
Pediatric Pain Control/Sedation	Ketamine

10. Dosing is outlined in each protocol.

Field Medication Box and IV Supplies

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

II. Medication boxes will be prepared by participating hospital pharmacies prior to each patient use. The pharmacy will manage the inventory for restocking medication boxes and IV kits or supplies. IV kits may be prepared and sealed by the pharmacy.

III. Medication boxes and IV kits (when prepared by the pharmacy) will be labeled with a pharmacy label which contains, at a minimum:
   A. The name of the re-stocking pharmacy
   B. The name or initials of the certifying pharmacist
   C. The expiration date of the box or kit (and ID of first expiring med)
   D. The date the box or kit was refilled
   E. The tag number of the locks assigned to the box.

IV. Licensed EMS personnel will assure that a proper seal is in place on any medication box or IV kit when it is provided by the participating pharmacy. The ambulance agency and licensed EMS personnel are responsible for the security of the medications and supplies.

V. Medication boxes and IV kits (supplies) shall be locked and secured in the EMS vehicle, except when required for patient care. Each agency will have a procedure in place to ensure controlled access to the drug box and IV kits (supplies).

VI. Licensed EMS personnel will document the medications used from the medication box and/or IV kit. A physician, PA or NP signature is required as part of the documentation when controlled substances are administered. The documentation will accompany the sealed medication box when returned to a secure location for pharmacy exchange.

VII. 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. This witness shall also sign their name on a patient care record, attesting to the disposal of the wasted medication.

VIII. 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.

IX. The pharmacy shall routinely inspect these medications and will verify the contents and replace the medications as necessary.

X. If a pharmacy or agency discovers a discrepancy in medication box contents, they shall contact the last pharmacy or agency which had possession of the box and mutually resolve the discrepancy. The pharmacy/agency, which discovered the discrepancy, shall submit a report to the medical control authority documenting the circumstances and the resolution. If the pharmacy and agency are not able to arrive at a mutually agreeable solution, the issue shall immediately be forwarded to the medical control authority for investigation and resolution.

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

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Pharmacy, Drug Box and IV Supply Exchange Procedure

1. Pharmacies operated within the member hospitals of the medical control authority in the medication exchange system established by this protocol are considered MCA participating pharmacies

2. The pharmacy is responsible for ensuring that re-stocked EMS drug boxes and IV supplies are available to EMS units who bring in a used 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".

    A. All medications in approved protocols must be supplied in correct dosages, concentrations and quantities.
    B. All medications carried must have a corresponding protocol for use.

3. The pharmacy is responsible for providing a secure environment for restocked drug boxes and IV supplies awaiting pickup by an EMS unit and used boxes brought back for restocking.

4. Upon receiving a used box from an EMS service, the pharmacy will check to assure that the box is properly sealed and contains documentation of medication use, signed by a physician for drug exchange, is in the box. The documentation will be checked, by the pharmacist, against the remaining contents of the box to assure accountability for all medications. The pharmacy will design a system whereby EMS units present appropriate documentation when replacing used IV supplies.

5. The pharmacy will replace the used contents of the drug box and IV supplies, and verify that all supplies and medications listed on the medical control authority drug box inventory form are present. The box will be sealed and secured.

    A. Each box will include either a standard usage log sheet or an inventory list.

6. The refilled drug box will then be relabeled with a pharmacy label which contains, at a minimum:
    A. The hospital name
    B. The name or initials of the pharmacist checking the box
    C. The date the box was restocked and checked.
    D. The expiration date of the first drug to expire in the box (this date must be at least three months from the date the box is being restocked and checked).
    E. The tag number of the locks assigned to the box.

F. Pharmacies must attach to the exterior of the box a notification regarding any changes to content of the drug box from the standard inventory contents.

7. Drug box contents remain the property of the participating pharmacy. The box itself is owned by the entity (EMS or hospital) that purchased it and entered it into the system. The medical control authority will maintain a listing of the drug box numbers currently "in service", and will assign new drug box numbers, as needed.

8. The Director of Pharmacy at each participating hospital is responsible for assuring compliance with this policy.

9. Unless addressed by approved protocol, all medications (including over the counter medications) must be obtained from an MCA recognized participating pharmacy.

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Naloxone Medication Kit Contents and Distribution Procedure

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.

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Epinephrine Auto-Injector Procedure

Aliases: Epi-Pen ®

Purpose: To allow use of epinephrine auto-injector/pediatric epinephrine auto-injector for life-threatening anaphylaxis by authorized prehospital providers licensed at or above the Emergency Medical Technician level. *If MCA selected, epinephrine auto-injectors are approved for Medical First Responder use.

MCA Approval of Epinephrine Auto-injector for Select MFR Agencies
(Provide List to BETP)
☐ YES ☐ NO

1. **Indications**
   A. Life-threatening allergic/anaphylactic reactions
   B. Use with Allergic Reaction/Anaphylaxis Protocol
2. **Contraindications**
   A. No absolute contraindications to life-threatening anaphylaxis
   B. Caution: Use with caution in patients with heart disease, high blood pressure, and stroke.
   C. Patient weight less than 10 kg.
3. **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: Epinephrine auto-injector (0.3 mg) is used for patients weighing over 32 kg. Pediatric epinephrine auto-injector (0.15 mg) is used for patients weighing at least 10 kg.
   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.
4. **Documentation**
   A. EMS providers will note any changes in the patient's condition and report those changes to on-line medical control and document changes on the run form and complete the Epinephrine Auto-injector Utilization Form.
5. **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 _____

Epinephrine Auto-Injector Procedure

Aliases: Epi-Pen ®

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Run Date _____

Patient Name _____

Physician _____

EMT or MFR _____

Receiving Hospital _____

Initial Date: 11/15/2012
Revised Date: 10/26/2018
2022 REVISIONS – PUBLIC COMMENT READY

Nebulized Bronchodilators

Indication

1. Patient with respiratory distress and wheezing.
2. When indicated under specific treatment protocol.

MCA Selection for Nebulizer

☐ EMT-B
☐ Specialist
☐ Paramedic

Procedure

1. Obtain vital signs and lung sounds.
2. Place the appropriate volume of medication in the lower half of the nebulizer unit. Then screw the upper half of the unit in place.
3. 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.
4. 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.
5. Set the oxygen liter flow at 6 L/min.
6. Instruct the patient to breathe normally through the mouthpiece, taking a deep inspiration every 4 or 5 breaths.
7. 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.
8. Obtain and record another complete set of vital signs and lung sounds after completion of the treatment.

Medication Dosage

1. Administer Albuterol 2.5 mg/3 mL NS nebulized, if available, repeat as indicated.
2. Administer treatment number one as Albuterol 2.5 mg/3 mL NS and Ipratropium 0.5 mg/3 mL NS nebulized if wheezing or airway constriction.
3. Per MCA selection administer additional bronchodilator treatments as Albuterol 2.5 mg/3 mL NS nebulized OR Albuterol 2.5 mg/3 mL NS and Ipratropium 0.5 mg/2.5 mL NS nebulized, as needed, if wheezing or airway constriction persists. For patients **age 5 or under**, Ipratropium 0.25 mg should be given in conjunction with albuterol.

ADDITIONAL BRONCHODILATOR TREATMENTS

☐ Albuterol 2.5 mg/ 3 mL NS
OR
☐ Albuterol 2.5 mg/3 mL NS and Ipratropium 0.5 mg/2.5 mL NS

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.

Initial Date: 11/15/2012
Revised Date: 10/26/2018
2022 REVISIONS – PUBLIC COMMENT READY

Nebulized Bronchodilators

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MCA Selection for Nebulizer

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☐ Paramedic

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ADDITIONAL BRONCHODILATOR TREATMENTS

☐ Albuterol 2.5 mg/ 3 mL NS
OR
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2-Pam Chloride/DuoDote

Protocols:
1. Nerve Agent Organophosphate exposure

Indications:
1. Exposure to organophosphate or nerve agents
2. Given in conjunction with atropine in DuoDote or Mark-1 kit

Contraindications:
1. None

Dosing:
1. Self-Rescue – 1 DuoDote (Mark-1) Injector
2. Mild Reaction
    a. Adults (8 years and over) – 1 DuoDote (Mark-1) Injector
    
    b. Pediatrics – Contact Medical Control
3. Moderate Reaction
    a. Adults (8 years and over) – 2 DuoDote (Mark-1) Injectors
    
    b. Pediatrics – Contact Medical Control
4. Severe Reaction
    a. Adults (8 years and over) – 3 DuoDote (Mark-1) Injector
    
    b. Pediatrics – 1 DuoDote (Mark-1) Injector, Contact Medical Control as needed

Expected Effects:
1. Decrease in symptoms

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

Acetaminophen

Protocols:
1. Pediatric Fever
2. Pain Management (per MCA selection)

Indications:
1. Fever
2. Mild pain

Contraindications:
1. Hypersensitivity
2. Known severe acute liver disease

Dosing:
1. Adults or pediatrics ≥ 50kg – 15 mg/kg PO/IV, maximum dose 1 gm
2. Pediatrics – 15 mg/kg PO/IV, maximum dose 500 mg

Expected effects:
1. Decrease temperature
2. Pain Relief

Side effects:
1. Nausea/vomiting

Acetaminophen

Protocols:
1. Pediatric Fever
2. Pain Management (per MCA selection)

Indications:
1. Fever
2. Mild pain

Contraindications:
1. Hypersensitivity
2. Known severe acute liver disease

Dosing:
1. Adults or pediatrics ≥ 50kg – 15 mg/kg PO/IV, maximum dose 1 gm
2. Pediatrics – 15 mg/kg PO/IV, maximum dose 500 mg

Expected effects:
1. Decrease temperature
2. Pain Relief

Side effects:
1. Nausea/vomiting

Adenosine (Adenocard)

Protocols:

1. Tachycardia (Adult and Pediatric)

Indications:

1. Specifically for treatment of Supraventricular Tachycardia.
2. Consider for regular or wide complex tachycardia.

Contraindications:

1. Sick sinus syndrome
2. Hypersensitivity to adenosine
3. 2nd or 3rd degree heart block

Dosing:

1. Adult
    a. 6 mg rapid IV/IO push over 1-3 seconds
    b. Repeat at 12 mg after 1-2 minutes, if no conversion
    c. Medication should be followed by a rapid 30 ml NS bolus
2. Pediatric
    a. 0.1 mg/kg IV/IO rapid bolus. (Max dose 6 mg)
    b. Repeat at 0.2 mg/kg after 2 minutes (Max dose 12 mg)
    c. Medication should be followed by rapid 5-10 ml NS flush

Expected Effects:

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

Side Effects:

1. Hypotension
2. Flushing
3. Dyspnea
4. Light-headedness
5. Nausea

Albuterol (Ventolin®)

Protocols:

1. Nebulized Bronchodilators
2. Crush Injury
3. Adult and Pediatric Respiratory Distress
4. Adult and Pediatric Allergic Reaction/Anaphylaxis

Indications:

1. Bronchospasm (wheezing)
2. Crush injury syndrome with evidence of hyperkalemia
3. Known or suspected hyperkalemia with medical direction

Contraindications:

1. Hypersensitivity to albuterol

Dosing:

1. Adults and pediatric
    a. 2.5 mg in 3 ml NS via nebulizer
    b. Larger doses and continuous albuterol in crush injury

Expected Effects:

1. Dilated bronchi
2. Improvement in capnographic waveform

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Expected Effects:

1. Dilated bronchi
2. Improvement in capnographic waveform

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Amiodarone (Cordarone)

Protocols:

1. General Cardiac Arrest – Adult and Pediatric
2. Tachycardia - Adult

Indications:

1. Recurrent ventricular fibrillation or recurrent pulseless ventricular tachycardia
2. Recurrent hemodynamically unstable ventricular tachycardia
3. Stable ventricular tachycardia in consultation with online medical control

Contraindications:

1. Hypersensitivity to Amiodarone

Dosing:

1. Adult
    a. Cardiac Arrest – persistent shockable rhythm
        i. 300 mg IV/IO
        ii. May repeat one time at 150 mg IV/IO
    b. Tachycardia
        i. Wide complex symptomatic but stable
        ii. 150 mg IV over 10 minutes
2. Pediatric – Persistent shockable rhythm in cardiac arrest
    a. 5 mg/kg IV/IO
    b. Max dose 300 mg
    c. May be repeated up to 2 more times (max total dose 15 mg/kg or 450 mg total)

Expected Effects:

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

Side Effects:

1. Prolonged QT
2. Vasodilation
3. Hypotension

Aspirin

Protocols:

1. Chest Pain/Acute Coronary Syndrome

Indications:

1. Suspected cardiac chest pain
2. Suspected Myocardial Infarction

Contraindications:

1. Hypersensitivity to aspirin or nonsteroidal anti-inflammatories

Dosing:

1. Adult Only Medication
    a. 324 (4x81mg) mg chewable tablet PO
    b. 325 mg tablet PO, chewed

Aspirin

Protocols:
1. Chest Pain/Acute Coronary Syndrome

Indications:
1. Suspected cardiac chest pain
2. Suspected Myocardial Infarction

Contraindications:
1. Hypersensitivity to aspirin or nonsteroidal anti-inflammatories

Dosing:
1. Adult Only Medication
   a. 324 (4x81mg) mg chewable tablet PO
   b. 325 mg tablet PO, chewed

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Atropine

Protocols:
1. Bradycardia (Adult and Pediatric)
2. Poisoning
3. Nerve Agents/Organophosphate exposure

Indications:
1. Symptomatic bradycardia with a suspected vagal origin
2. Exposure to organophosphates or other nerve agents

Contraindications:
1. Known hypersensitivity (no absolute contraindications)

Dosing:
1. Symptomatic Bradycardia
    a. Adult:
        i. Administer 1 mg IV/IO every 3-5 minutes
        ii. Max dose 3 mg
    b. Pediatric:
        i. Given ONLY if primary AV block, or if bradycardia is unresponsive to oxygenation, ventilation and epinephrine.
        ii. Administer 0.01-0.02 0.02 mg/kg IV/IO
        iii. Minimum single dose 0.1 mg
        iv. Maximum single dose 1 mg
        v. Repeat prn in 5 minutes, maximum total dose 3 mg
2. Organophosphate/Nerve Agent Exposures
    a. Adults
        i. 2-6 mg IV/IM per Mark 1 Kit Dosing Directive (each kit contains 2 mg of atropine)
        ii. If kit is not available administer 2-6 mg IV/IM as needed
    b. Pediatrics
        i. Infant 0.05-0.1 mg/kg IM/IV/IO (0.2-1 mg), Pediatric Atropen or Vial
        ii. Child 1-4 mg IM/IV/IO, Pediatric Atropen, Vial, or Mark 1

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

Atropine

Protocols:
1. Bradycardia (Adult and Pediatric)
2. Poisoning
3. Nerve Agents/Organophosphate exposure

Indications:
1. Symptomatic bradycardia with a suspected vagal origin
2. Exposure to organophosphates or other nerve agents

Contraindications:
1. Known hypersensitivity (no absolute contraindications)

Dosing:
1. Symptomatic Bradycardia
   a. Adult:
      i. Administer 1 mg IV/IO every 3-5 minutes
      ii. Max dose 3 mg
   b. Pediatric:
      i. Given ONLY if primary AV block, or if bradycardia is unresponsive to oxygenation, ventilation and epinephrine.
      ii. Administer 0.01-0.02 0.02 mg/kg IV/IO
      iii. Minimum single dose 0.1 mg
      iv. Maximum single dose 1 mg
      v. Repeat prn in 5 minutes, maximum total dose 3 mg
2. Organophosphate/Nerve Agent Exposures
   a. Adults
      i. 2-6 mg IV/IM per Mark 1 Kit Dosing Directive (each kit contains 2 mg of atropine)
      ii. If kit is not available administer 2-6 mg IV/IM as needed
   b. Pediatrics
      i. Infant 0.05-0.1 mg/kg IM/IV/IO (0.2-1 mg), Pediatric Atropen or Vial
      ii. Child 1-4 mg IM/IV/IO, Pediatric Atropen, Vial, or Mark 1

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

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Initial Date: 10/25/2017
Revised Date:

Calcium Chloride

Protocols:

1. Poisoning/Overdose
2. Crush Injury
3. Cardiac Arrest General – Adult

Indications:

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

Precautions:

1. May precipitate digitalis toxicity
2. Extremely important to flush IV line fully after administration

Dosing:

1. Cardiac Arrest
    a. Adult:
        i. 1 gm slow IV
2. Calcium channel blocker toxicity
    a. Adult: 0.5 – 1 gm IV
3. Crush Injury
    a. Adult: 1 gm slow IV over 5 minutes, after extrication

Expected Effects:

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

Dextrose

Protocols:

1. Adult and Pediatric Seizures
2. Adult and Pediatric Altered Mental Status

Indications:

1. Hypoglycemia
2. Altered mental status in the absence of a glucometer

Contraindications:

None

Concentration:

1. Dextrose 10% 25 gm in 250 ml
2. Dextrose 12.5% (for patients up to 2 months of age)
    a. Created by expelling 37.5 ml from Dextrose 50% 50 ml syringe and drawing up 37.5 ml of NS
    b. Creates 6.25 gm/ 50 ml concentration of 12.5%
3. Dextrose 25% (for patients between 2 months and 6 years of age)
    a. Created by expelling 25 ml from Dextrose 50% 50 ml syringe and drawing up 25 ml of NS
    b. Creates 12.5 gm/50 ml concentration of 25%
4. Dextrose 50% (prefilled syringe of 25 gm in 50 ml)

Dosing (ensure patent IV):

1. Pediatric (weight based)

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

2. Adult
    a. Dextrose 50%, 25 gm, 50 ml
    b. Dextrose 10%, 25 gm, 250 ml

Incompatibilities/Drug Interactions:

1. Sodium bicarbonate
2. Diazepam will precipitate if given concurrently without flushing

Dextrose

Protocols:
1. Adult and Pediatric Seizures
2. Adult and Pediatric Altered Mental Status

Indications:
1. Hypoglycemia
2. Altered mental status in the absence of a glucometer

Contraindications:
None

Concentration:
1. Dextrose 10% 25 gm in 250 ml
2. Dextrose 12.5% (for patients up to 2 months of age)
    a. Created by expelling 37.5 ml from Dextrose 50% 50 ml syringe and drawing up 37.5 ml of NS
    b. Creates 6.25 gm/ 50 ml concentration of 12.5%
3. Dextrose 25% (for patients between 2 months and 6 years of age)
    a. Created by expelling 25 ml from Dextrose 50% 50 ml syringe and drawing up 25 ml of NS
    b. Creates 12.5 gm/50 ml concentration of 25%
4. Dextrose 50% (prefilled syringe of 25 gm in 50 ml)

Dosing (ensure patent IV):
1. Pediatric (weight based)

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

2. Adult
    a. Dextrose 50%, 25 gm, 50 ml
    b. Dextrose 10%, 25 gm, 250 ml

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3-5 kg, Dextrose 12.5%, dose: 2.5g, Volume: 20mL or Dextrose 10%, 25 ml¶
6-7 kg, Dextrose 25%, dose: 3.25g, volume 13 mL or Dextrose 10%, 33 ml¶
8-9 kg, Dextrose 25%, dose: 4.25g, volume 17 mL or Dextrose 10%, 43 ml¶
10-11 kg, Dextrose 25%, dose: 5g, volume 20 mL or Dextrose 10%, 50 ml¶
12-14 kg, Dextrose 25%, dose 6.25g, volume 25 mL or Dextrose 10%, 63 ml¶
15-18 kg, Dextrose 25%, dose 8 g, volume 32 mL or Dextrose 10%, 80ml¶
19-23 kg, Dextrose 25%, dose 10g, volume 40 mL or Dextrose 10%, 100 ml¶
24-29 kg, Dextrose 50%, dose 12.5g, volume 25 mL or Dextrose 10%, 125 ml¶
30-36 kg, Dextrose 50%, dose 15g, volume 30 mL or Dextrose 10%, 150 ml¶

Incompatibilities/Drug Interactions:
1. Sodium bicarbonate
2. Diazepam will precipitate if given concurrently without flushing

Diazepam

Protocols:

1. As indicated in **Medication Substitution Protocol**

Indications:

1. Seizures when first line medications are not available

Precautions:

1. Respiratory depression
2. Hypotension

Dosing:

1. Adult: 5-10 mg IM/IV
2. Pediatric: 0.2 - 0.5 mg/kg IM/IV

Expected Effects:

1. Skeletal muscle relaxation
2. Ceasing of seizure activity

Initial Date: 10/25/2017
Revised Date:

Diphenhydramine (Benadryl ®) Ⓢ

Protocols:

1. Anaphylaxis/Allergic reaction
2. Poisoning/overdose

Indications:

1. Anaphylaxis
2. Mild or moderate allergic reaction
3. Urticaria

Contraindications:

1. Lower respiratory distress
2. Hypersensitivity to diphenhydramine

Dosing:

1. Adult: 50 mg IM or IV
2. Pediatric: 1-1.5 mg/kg IM or IV

Expected Effects:

1. Antihistamine, decreased urticarial, itching
2. Drowsiness

Fentanyl

Protocols:
1. Intranasal Medication Administration
2. Pain Management
3. Patient Sedation

Indications:
1. Pain management
2. Patient sedation

Contraindications:
1. Altered Mental Status
2. Hypotension
3. Respiratory Depression
4. Hypersensitivity to Fentanyl

Dosing:
1. Adult
    a. 1 mcg/kg
        i. Patients > 65 years old may receive 0.5 mcg/kg based on clinical considerations.
    b. Single dose up to 100 mcg
    c. May repeat, up to a max dose of 200 mcg
2. Pediatric
    a. 1 mcg/kg
    b. Single dose up to 40 mcg (otherwise dose as adult)
    c. May repeat, total dose up to 80 mcg

Expected Effects:
1. Decreased pain
2. Decreased agitation

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

Special Notes:
1. Naloxone will reverse the effect of Fentanyl
2. Administration with Ondansetron for nausea is encouraged

Fentanyl

Protocols:
1. Intranasal Medication Administration
2. Pain Management
3. Patient Sedation

Indications:
1. Pain management
2. Patient sedation

Contraindications:
1. Altered Mental Status
2. Hypotension
3. Respiratory Depression
4. Hypersensitivity to Fentanyl

Dosing:
1. Adult
    a. 1 mcg/kg
        i. Patients > 65 years old may receive 0.5 mcg/kg based on clinical considerations.
    b. Single dose up to 100 mcg
    c. May repeat, up to a max dose of 200 mcg
2. Pediatric
    a. 1 mcg/kg
    b. Single dose up to 40 mcg (otherwise dose as adult)
    c. May repeat, total dose up to 80 mcg

Expected Effects:
1. Decreased pain
2. Decreased agitation

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

Special Notes:
1. Naloxone will reverse the effect of Fentanyl
2. Administration with Ondansetron for nausea is encouraged

Glucagon

Protocols:
1. Altered Mental Status (Adult and Pediatric)
2. Seizures (Adult and Pediatric)

Indications:
1. Hypoglycemia with inability to obtain IV access

Contraindications:
1. Adrenal gland tumor
2. Hypersensitivity to glucagon

Dosing:
1. Adult: 1 mg IM/SQ
2. Pediatric = >20kg: 0.05 mg/kg up to 1 mg IM/SQ
3. Pediatric < 20kg: 0.03 mg/kg up to 1 mg IM/SQ

Expected Effects:
1. Increased blood glucose

Side Effects:
1. Nausea
2. Vomiting

Glucagon

Protocols:
1. Altered Mental Status (Adult and Pediatric)
2. Seizures (Adult and Pediatric)

Indications:
1. Hypoglycemia with inability to obtain IV access

Contraindications:
1. Adrenal gland tumor
2. Hypersensitivity to glucagon

Dosing:
1. Adult: 1 mg IM/SQ
2. Pediatric = >20kg: 0.05 mg/kg up to 1 mg IM/SQ
3. Pediatric < 20kg: 0.03 mg/kg up to 1 mg IM/SQ

Expected Effects:
1. Increased blood glucose

Side Effects:
1. Nausea
2. Vomiting

Hydromorphone

Protocols:
1. Pain Management (MCA Selection)

Indications:
1. Severe pain with extended transport time

Contraindications:
1. Hypersensitivity
2. Hypotension
3. Hypovolemia

Dosing:
1. Adults only 0.5 mg IV/IM
2. IV dose must be administered slowly, over 2 minutes
3. A single second dose of 0.25 mg IV/IM for a maximum total dose of 0.75 mg

Expected Effects:
1. Decreased pain

Side Effects:
1. Respiratory depression
2. Hypotension
3. Altered mental status

Hydromorphone

Protocols:
1. Pain Management (MCA Selection)

Indications:
1. Severe pain with extended transport time

Contraindications:
1. Hypersensitivity
2. Hypotension
3. Hypovolemia

Dosing:
1. Adults only 0.5 mg IV/IM
2. IV dose must be administered slowly, over 2 minutes
3. A single second dose of 0.25 mg IV/IM for a maximum total dose of 0.75 mg

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Expected Effects:
1. Decreased pain

Side Effects:
1. Respiratory depression
2. Hypotension
3. Altered mental status

Cyanokit ® (Hydroxocobalamin)

Note: This medication may not be in the formulary of an ALS medication box and may arrive on the scene through an alternate mechanism (MEDRUN or MCA approved responding apparatus).

Protocols:

1. Cyanide Exposure Supplement Protocol

Indications:

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

Contraindications:

1. Hypersensitivity to hydroxocobalamin or cyanocobalamin
2. Can NOT be administered in the same line as dopamine or fentanyl

Dosing:

1. A one vial kit with 5g of hydroxocobalamin powder must be reconstituted with 200mL of normal saline, be rotated or tipped for 60 seconds (not shaken) and administered through its own IV/IO line (not used with any other medication) over 15 minutes.

Color	Weight	Age	Cyanokit® Concentration	Cyanokit® Dose	Cyanokit® Volume
Grey	3-5 kg (6-11 lbs.)	0-2 months	70 mg/ml	250 mg	10 mL
Pink	6-7 kg (13-16 lbs.)	3-6 months	70 mg/ml	500 mg	20 mL
Red	8-9 kg (17-20 lbs.)	7-10 months	70 mg/ml	625 mg	25 mL
Purple	10-11 kg (21-25 lbs.)	11-18 months	70 mg/ml	750 mg	30 mL
Yellow	12-14 kg (26-31 lbs.)	19-35 months	70 mg/ml	900 mg	36 mL
White	15-18 kg (32-40 lbs.)	3-4 years	70 mg/ml	1100 mg	44 mL
Blue	19-23 kg (41-50 lbs.)	5-6 years	70 mg/ml	1400 mg	56 mL
Orange	24-29 kg (52-64 lbs.)	7-9 years	70 mg/ml	1750 mg	70 mL
Green	30-36 kg (65-79 lbs.)	10-14 years	70 mg/ml	2500 mg	100 mL (1/2 bottle)
ADULT		>14 years	70 mg/ml	5000 mg	200 mL (full bottle)

Expected Effects:

1. Increased blood glucose

Side Effects:

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

Cyanokit ® (Hydroxocobalamin)

Note: This medication may not be in the formulary of an ALS medication box and may arrive on the scene through an alternate mechanism (MEDRUN or MCA approved responding apparatus).

Protocols:

1. Cyanide Exposure Supplement Protocol

Indications:

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Dosing:

1. A one vial kit with 5g of hydroxocobalamin powder must be reconstituted with 200mL of normal saline, be rotated or tipped for 60 seconds (not shaken) and administered through its own IV/IO line (not used with any other medication) over 15 minutes.

Color	Weight	Age	Cyanokit® Concentration	Cyanokit® Dose	Cyanokit® Volume
Grey	3-5 kg (6-11 lbs.)	0-2 months	70 mg/ml	250 mg	10 mL
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Red	8-9 kg (17-20 lbs.)	7-10 months	70 mg/ml	625 mg	25 mL
Purple	10-11 kg (21-25 lbs.)	11-18 months	70 mg/ml	750 mg	30 mL
Yellow	12-14 kg (26-31 lbs.)	19-35 months	70 mg/ml	900 mg	36 mL
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Blue	19-23 kg (41-50 lbs.)	5-6 years	70 mg/ml	1400 mg	56 mL
Orange	24-29 kg (52-64 lbs.)	7-9 years	70 mg/ml	1750 mg	70 mL
Green	30-36 kg (65-79 lbs.)	10-14 years	70 mg/ml	2500 mg	100 mL (1/2 bottle)
ADULT		>14 years	70 mg/ml	5000 mg	200 mL (full bottle)

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Pediatrics:

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AGE GROUP ...

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ONE VIAL KIT (5G / 200ML)

Expected Effects:

1. Increased blood glucose

Side Effects:

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