

ASPR TRACIE Technical Assistance Request

Requestor:

Requestor Phone:

Requestor Email:

Request Receipt Date (by ASPR TRACIE): 21 December 2015

Type of TTA Request: Standard

Request:

The requestor is asking for a formulary or list of drugs commonly used by pre-hospital emergency medical services (EMS) providers for trauma patients and specifically for those used during large scale events. The requestor is looking for the purposes of potentially stockpiling these drugs versus a desire to change protocols or add to the existing approved formulary. The specific request is quoted below.

“Recently a hospital emergency manager has asked our coalition a question regarding drugs/medication for trauma events that I request assistance with. The question is: is there a recommended list of specific disaster trauma drugs for use by first responders (Fire/EMS) during/following a mass casualty event such as an earthquake or mass shooting? Many of the drugs EMS carries on their rigs are for medical purposes such as chest pain. But are there recommend drugs for trauma events that are either specific to first responders or more general to hospitals and other providers?”

Response:

Methodology:

ASPR TRACIE conducted a review of commonly used medications on State EMS formularies, which is listed in Appendix A and organized by drug category. Appendix B lists only the most commonly used drug categories; those most appropriate to trauma care have been highlighted. Appendix C provides three resources that discuss pharmacy stockpiling for mass trauma events.

This list, along with the specific request, was sent to ASPR TRACIE Subject Matter Expert Cadre members with expertise in Emergency Department and Trauma Clinical Care, and EMS. Their recommendations are captured below. Additional Cadre member reviews are still pending and ASPR TRACIE will update this response when received.

Recommendations and comments from the SME Cadre

Medications

In a disaster, it is extremely difficult, with mass numbers of patients, to do much with medications pre-hospital. A lot of care reverts to basic life support (BLS) with IVs for fluid resuscitation or medication administration done en route, if at all. After time, it may be that the efforts concentrate on multiple trapped patients in which case the approach can change from limited care for the masses to more focused care on a smaller number of patients. There are also

issues with making the administration of these medications part of standing orders and keeping medics trained - if they don't use it routinely, they won't during a disaster/MCI.

Please note that the information below is a list of medications most needed during mass trauma events, not single patient trauma events. The medications do not include specific resuscitative drugs or vasopressors, consistent with Advanced Cardiac Life Support and Advanced Trauma Life Support protocols because, as mentioned above, in a triage situation, there will not be enough ALS resources to care for a large number of critically injured patients, therefore stockpiling those drugs would be unnecessary.

What to have extra of:

1. First and foremost - Analgesia – Morphine sulphate or Dilaudid, whatever is usually carried but with appropriate orders/supplies to give IM or intranasal.
 - a. A great crossover agent is ketamine - can be used for sedation as well as analgesia, quite safe, but not permitted in many jurisdictions for pre-hospital use.
 - b. Additionally, having oral narcotics can be a huge advantage - but these would need to be carried by a supervisor, probably, as the diversion risk is high and daily use not common unless the service uses oral analgesia on a regular basis - few do, but it's a good idea.
 - c. Again, bulking up stocks of narcotics carries challenges, but it's the single biggest thing that's needed.
 - d. Must develop protocols to prevent narcotics diversion in conjunction with supplying pharmacy and the DEA.*
2. Electrolyte - Sodium bicarbonate - can be life-saving for entrapped patients during their extrication to prevent complications of Rhabdomyolysis.
 - a. NOTE: The packaging is bulky and there have been issues recently with supply.
3. Anxiolytics – Consider Benzodiazepines - but best thing to use is analgesia which also helps with anxiolysis.
4. Blood / tranexamic acid - may have a role pre-hospital - needs to be sorted out prior to an event, but in the right situation, for entrapped patients, can make a big difference - not needed in bulk but need to figure out (prior to an event) how to get it to the scene, how to administer it, and when and how to train personnel on the procedure.
5. Anti-emetic/Anti-nausea - Zofran oral dissolving tablets and for IV use for nausea/vomiting - narcotics often can cause nausea and vomiting, as can the stress of the event.
6. Intravenous fluids - extra Lactated Ringers or Normal Saline, particularly for entrapped patients.
7. Oxygen – ensure surge capability for tanks*
8. Bronchodilators – chemical incidents or incidents with building collapse and dust can exacerbate existing lung conditions.*

9. Supplies for administration – needles, syringes, IV supplies to administer all the above interventions.

Further down the list would be injectable (ketorolac) or oral (ibuprofen) NSAIDs, as well as extra stocks of rapid sequence intubation (RSI) drugs, if/as permitted in the service area.

But again - the ***number one*** thing is to figure out how you can get additional narcotics stocked as well as cached for easy access, along with administration supplies - and consider nasal/IM/oral routes as it takes time to start IVs and access may be an issue.

Please note that these recommendations are based on most commonly used medications and this is not intended to supersede any local or state protocols or formularies. *

*Stockpiling**

When stockpiling consider the following:

1. Will these items be rotated through the hospitals to avoid waste due to expiration dates? Discuss with hospital pharmacies whether they can take back medication that has left the facility.
2. Develop protocols for accessing the stockpile. Who can access, how can they access, and under what circumstances, with what permissions?
3. Develop a plan to deliver the stockpiled items to the field and to track them.
4. Ensure hospitals are compliant with the Medication Management Chapter of the Joint Commission standard

Appendix A: A Review of State EMS Drug Formularies

Analgesic

Acetaminophen
Dilaudid
Fentanyl
Ketorolac
Meperidine
Morphine Sulfate
Nalbuphine
Stadol

Anesthetic (topical)

Proparacaine
Tetracaine

(ophthalmic)

Anti-Arrhythmic

Adenosine
Amiodarone
Atropine
Diltiazem
Lidocaine
Procainamide
Sotalol
Verapamil

Antidote

DuoDote
Naloxone
Hydroxobalamin
Flumazenil
Pralidoxime
Sodium Thiosulfate

Anti-Emetic

Dolasetron
Droperidol
Metoclopramide
Ondansetron

Anti-Emetic/Sedative

Prochlorperazine
Promethazine

Antihistamine

Diphenhydramine

Antihistamine/Antacid

Cimetidine
Famotidine
Ranitidine

Anti-Psychotic

Haloperidol
Ziprasidone

Benzodiazepine

Diazepam
Lorazepam
Midazolam

Beta-blocker

Labetalol
Metoprolol
Propranolol

Broad-spectrum Antibiotics

Bronchodilator

Albuterol
Ipratropium
Levalbuterol
Metaproterenol
Racemic Epi
Terbutaline
Aminophylline

Decongestant (topical)

Oxymetazoline

Diuretic

Bumetanide
Furosemide

Electrolyte

Calcium Chloride
Calcium Gluconate
Lactated Ringers
Magnesium Sulfate
Normal Saline
Sodium Bicarbonate

Emetic

Charcoal

Glucose Agent/Diabetic

Dextrose 10%
Dextrose 25%
Dextrose 50%
Glucagon
Glucose Oral
Insulin

Hormone

Oxytocin

NSAID

Aspirin
Ibuprofen

Oxygen

Oxygen

Depolarizing Paralytic

Succinylcholine

Non-Polarizing Paralytic

Pancuronium
Rocuronium

Bromide

Vecuronium

Sedative

Etomidate
Ketamine
Methohexital
Nitrous Oxide
Propofol

Steroid

Dexamethasone
Methylprednisolone
Prednisone

Sympathomimetic

Epinephrine 1:1000
Epinephrine 1:10000
Epinephrine Auto-

Injectors

Vasodilator

Amyl Nitrite
Nitroglycerin

Vasopressor

Dobutamine
Dopamine
Norepinephrine
Vasopressin

Vitamin

Pyridoxine HCL
Thiamine

Platelet Inhibitor/Blood

Thinner/Clot buster

Clopidogrel
High Dose Heparin
Tenecteplase

Appendix B: Drug Categories Most Frequently Carried by EMS Agencies

Medications contained within pre-hospital emergency medical services pharmaceutical formularies generally fall within the following categories:

- Analgesic
- Anesthetic (topical)
- Anti-Arrhythmic
- Antidote
- Anti-Emetic/Anti-Emetic- Sedative
- Antihistamine
- Antihistamine/Antacid
- Anti-Psychotic
- Benzodiazepine
- Beta-blocker
- Broad-spectrum antibiotics
- Bronchodilator
- Decongestant (topical)
- Diuretic
- Electrolyte
- Emetic
- Glucose Agent
- Hormone
- Non-steroidal anti-inflammatory
- Oxygen
- Depolarizing Paralytic
- Non-Polarizing Paralytic
- Sedative
- Steroid
- Sympathomimetic
- Vasodilator
- Vasopressor
- Vitamin
- Platelet Inhibitor/blood thinner/clot busters

There are certainly cases where other categories of drugs may be used on a trauma patient, but those highlighted in yellow are the most frequently used first-line drugs to treat the physiological effects of trauma in the pre-hospital setting.

Appendix C: Resources

Centers for Disease Control and Prevention. (2010). [Managing Surge Needs for Injuries: Drugs and Pharmaceutical Supplies.](#)

The CDC outlines the drugs needed to manage the patient influx following an explosive mass trauma event. They use the assumption that jurisdictions should stockpile the necessary medications to treat up to 300 patients, presenting within 4 hours of an explosion, and maintain treatment for up to 72 hours without assistance. Drugs are listed by category.

Goldschmitt, D, et al. (2009). [Medical Disaster Response: A Survival Guide for Hospitals in Mass Casualty Events.](#) Page 448.

The authors highlight the pharmacy needs during a mass casualty event and note which drugs a hospital pharmacy may need to stockpile.

Rubinson, L, et al. (2007). [Definitive Care for the Critically Ill During a Disaster: A Framework for Optimizing Critical Care Surge Capacity.](#) Task Force for Mass Critical Care Summit Meeting.

The authors discuss strategies and recommendations for emergency mass critical care. Pages 5-6 of the document describe pharmaceutical priorities in a mass trauma surge event.