Nonurban Missouri Healthcare Coalition Chemical Annex

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Name	Title	Date	Summary of Changes

INTRODUCTION

Purpose

This plan provides the framework to guide the NUMO HCC to respond to chemical incidents among diverse health and medical entities supporting ESF-8 functions within the coalition's boundaries.

The NUMO HCC's primary role in response is to represent member organizations through multi-agency coordination and to support organizational incident management through information and resource coordination. This requires coordination among a broad spectrum of health care providers including but not limited to hospitals, local public health agencies, emergency medical services and emergency management. NUMO HCC preparedness and response structures also incorporate representation from the 17 provider and supplier types outlined in the Centers for Medicare and Medicaid Conditions of Participation, mental/behavioral health providers, community, and faith-based partners, as well as state and local governments.

All emergencies require a coordinated approach in which multiple disciplines and organizations, both public and private, work together. The NUMO HCC serves as the body to coordinate the response among a diverse group of healthcare organizations. This role is essential given that disasters often necessitate public health and medical response.

Scope

This plan applies to all NUMO HCC members when an event occurs that is beyond an individual healthcare organization's ability to manage the response. This plan does not dictate organizational response, nor does it supersede or conflict with jurisdictional or agency responsibilities, applicable laws and statutes. The Nonurban Missouri Health Care Coalition facilitates information sharing and coordination, but not direction and control, as there is no statutory authority governing the NUMO HCC.

The Nonurban Missouri Health Care Coalition Response Plan will be managed and maintained by Missouri Hospital Association (MHA) on behalf of the NUMO HCC. MHA will update this plan following an exercise or real-world event, or at least once annually with guidance from the Nonurban Missouri Health Care Coalition Leadership Board. The plan will be reviewed and accepted by all NUMO HCC members. Participating members are responsible for updating their respective facility EOPs.

Overview/Background of HCC and Situation

Assumptions

- All hospitals with emergency departments are designated as "first Receiver" facilities for chemical and HAZMAT incidents and are equipped to respond to an initial incident.

- All frontline healthcare facilities, including any facility equipped for emergency care, such as hospital-based emergency departments and other emergency care settings including urgent care clinics and critical access hospitals, shall maintain procedures to respond to mass casualty incidents and coordinate local, regional, and state support through their individual Emergency Operations Plan.
- Fire and EMS Pre-hospital care providers will maintain Hazmat operational awareness within their own entity.
- Missouri partners will utilize the National Incident Management System (NIMS) and Incident Command System (ICS) to coordinate operations.
- As small scale and individual hazmat events are not a part of a HCC response, these are not addressed however the clinical care resources maybe used to support patient care activities.
- Patient movement plans are outlines in the Missouri Patient Movement Plan.

CONOPS

Activation and notifications, roles and responsibilities are consistent with the NUMO HCC Response plan. Logistics, including staffing, and special considerations are an imbedded component of the NUMO HCC response plan and should be requested, accessed and supported within the established methodologies of the NUMO HCC.

Operations Medical Care:

Response and medical direction is with the authority established by each entity. Operations and medical care is encouraged to be consistent with the HERT principles of operations and decontamination and OSHA's" Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances" guidance. Clinical care guidance for HCC providers in this annex are based primarily off TCCC MARCH and MARCH2 Guidance, HHS Chemical Hazards Emergency Management content and prolonged casualty care principles from the Joint Trauma system. As small scale and individual hazmat events are not a part of a HCC response, these are not addressed however the clinical care resources maybe used to support patient care activities.

Triage / Tracking

Casualty collection points both in the field and at the first receiver facility are encouraged. Patients should be triaged and/or re-triaged at the casualty collection points.

General Principles followed:

- Triage or re-triage all patients at field casualty collection points.

- Provide visual indicator of patients' triage status such as colored triage tape, triage bands, or triage tags.
- Keep minors and caregivers together whenever possible.
- A transport officer should be assigned at the casualty collection point to record and oversee transport to the appropriate initial hospital facility. The transport officer should maintain a HICS 254 – Disaster Victim/Patient Tracking Tool or equivalent process on the scene to support patient tracking.
- All patients should be triaged or re-triaged upon coming into the hospital casualty collection point or treatment area. IF triage cards are utilized, every effort should be made to keep their initial triage card with them to endpoint care (as defined in this circumstance as hospital admission or collected upon discharge).
- Hospitals will provide a medical screening exam and care for impacted patients within their own facilities protocols. Hospitals should provide a HICS 259- Hospital Casualty / Fatality Report; Hourly for the first 4 hours of the MCI event, then every 2 hours for the initial 8-hour response window. HICS 259s should be completed every 4 hours throughout the remaining initial 24 hours. HICS 259 should be completed every 8 hours until all patients have been appropriately cared for based upon the resources available.
- A transport officer at the hospital should be assigned to record and oversee the movement of patients to other treatment sites or funeral homes. The transport officer should maintain a HICS 255- Master Patient Evacuation Tracking form to support patient tracking.

The healthcare coalition may, if requested, assist with patient tracking and family connection. NUMO HCC partnerships with the American Red Cross can be used to support notification and reunification of patients. HCCs may be particularly helpful in collating information from various facilities and supporting incident response through situational awareness.

The Healthcare Coalition should work towards completing an ICS 209M Burn MCI Incident Status Summary at the end of each operational period to share with relevant partners, including EMS mutual Aid at the SEOC, and reported in the appropriate WEB EOC incident. Chemical patient numbers should be substituted for "burn" numbers. This form should be shared with the DHSS Emergency Response Center and in WEB EOC as an update.

Treatment:

Patient treatment protocols remain with the responding entity and entity providing patient care. Subject matter expert clinicians may be available through the HCC for consultation. Orders and clinical care remain the responsibility of the entity assuming primary patient care. To support just-in-time chemical incident patient care links to the HHS CHEMM tool and treatment guidelines, and The Joint Trauma System Clinical Care Guidelines have been provided as links here and in Appendix B.

> Identification of substance in question is primarily the responsibility of those on scene and that entity is expected to vary by local response processes agencies and will vary based upon local resources. Clinical providers including EMS and Emergency Departments that are unclear as to the chemical in question can use the CHEMM Intelligent Syndromes Tool (CHEMM-IST 2.0) to support initial treatment plans. In addition, the Missouri Poison Center (also known as MO Poison Control) should be consulted as toxicology experts are most readily available 24/7 at this location. This information should be shared widely through appropriate channels with other responding agencies, including the HCC for safety and situational awareness.

CHEMM Toxidrome Cards

- Acute Exposure to Solvents, Anesthetics, or Sedatives (SAS) Toxidrome (PDF - 573 KB)
- Anticholinergic Toxidrome (PDF - 534 KB)
- Anticoagulants Toxidrome (PDF - 574 KB)
- Cholinergic Toxidrome (also called Pesticide or Nerve Agent Syndrome) (PDF - 571 KB)
- Convulsant Toxidrome (PDF - 547 KB)
- Irritant/Corrosive Toxidrome, Ingestion (PDF - 552 KB)
- Irritant/Corrosive Toxidrome, Inhalation (PDF - 573 KB)
- Irritant/Corrosive Toxidrome, Topical (PDF - 560 KB)
- Knockdown Agent - Cellular Asphyxiant Toxidrome (PDF - 566 KB)
- Knockdown Agent - Simple Asphyxiant Toxidrome (PDF - 594 KB)
- Opioid Toxidrome (PDF - 181 KB)
- Stress-Response/Sympathomimetic Toxidrome (PDF - 551 KB)

ATSDR – Agency for Toxic Substances and Disease Registry also provides extensive treatment resources fir responders at all levels.

Initial Treatment:

(MARCHE)2

TCCC + CBRN = (MARCHE)^2			
	Hot Zone	**Warm Zone**	**Cold Zone**
Priorities	• Think Care Under Fire, sometimes agent is like effective fire • "What is killing the casualty now, is it the agent or trauma?" The answer to this question dictates your treatments • Triage • Treat only immediate life-threats • Expose only what is needed to save life. • CRESS assessment. Identify nerve agent exposure. • If chemical contamination of a wound is suspected, expose perform rapid spot decontamination as soon as possible • Protect yourself and the casualty from the threat: time, distance, shielding, upwind, uphill, upstream • Heat injury from operating in PPE is common and may be unrelated to the agent. • Getting to the warm zone may require prolonged movement of the casualty. • A medic caring for chemical casualties is contaminated (dirty medic) and cannot cross to cold zone with patient until decontaminated. • In conventional TCCC, only massive hemorrhage is addressed during CUF. However, some chemical agents are rapid killers. Nerve agent antidotes and rapid decontamination must be administered as early as possible.	• Think Tactical Field Care • "What is killing the casualty now, is it the agent or trauma?" The answer dictates your treatments • Triage • Provide only life-saving care, get them to the cold zone for definitive care. • Replace dirty tourniquets and decontaminate indwelling devices or replace as indicated. • Casualty may require advanced airway management and ventilator support • Perform cutout and thorough decontamination. • Perform treatments while decontamination is being conducted. "Expose to treat". • Assess circulation and administer resuscitation fluids per TCCC guidelines only if absent radial pulse • Countermeasures: administer specific treatments for life-threats as needed based on exposure and symptoms • Hypothermia is a threat due to exposure during decontamination. • Determine whether altered mental status is due to chemical agent or trauma	• Think Tactical Evacuation or Prolonged Field Care • "What is killing the casualty now, is it the agent or trauma?" The answer to this question dictates your treatments. • Triage • Anticipate and mitigate hypothermia. • Receiving medical personnel may have little to no experience with CBRN. Ensure effective patient handoff. • Clean Medic (remains on cold zone side of hot line and not exposed to contaminated casualties)
TCCC	M: Massive Hemorrhage	M.A.R.: reassessment	(MARCHE)^2 reassessment
	A: Airway, assess	C: Circulation and Shock Status	
	R: Respirations, assess	H: Hyperthermia, H: Head Wounds (altered mental status	
	E: Extraction	E: Evacuation	
CBRN	M: Don Mask, Mask check	M.A.R.: reassessment	(MARCHE)^2 reassessment
	A: Antidote (ATNAA/CANA)	C: Countermeasures (drips, nebulized medicines, etc.)	
	R: Rapid Shot Decontamination	H: Hyperthermia, H: Head Wounds (altered mental status	
	E: Extraction	E: Evacuation	

Terms: (MARCH)^2: Massive hemorrhage/Mask, Airway/Antidote, Respiration/Rapid spot decontamination, Circulation/Countermeasures, Head/Hypothermia, Extraction/Evacuation
TCCC: Tactical Combat Casualty Care; CBRN: chemical, biological, radiological, nuclear; CRESS: Consciousness, Respirations, Eyes, Secretions, Skin PAPR: Powered Air Purifying Respirator; SCBA: Self Contained Breathing Apparatus; ATNAA: Antidote Treatment Nerve Agent Auto-injector; CANA: Convulsant Antidote for Nerve Agent

Treatment Area Care (taken from chemm.hhs.gov)

Re-Triage

Post decontamination, patients should be re-triaged and appropriate treatment and supportive care provided consistent with patient needs and available resources.

Advanced Treatment

Severe Exposure

- Review Airway, Breathing, Circulation, Disability, and Exposure. Place patient in the Left Lateral Position, preferably with head lower than the feet, to reduce the risk of aspirating stomach contents. Provide high flow oxygen, if available. Intubate the patient if their airway or breathing is compromised. Treat complicating injuries.
- Obtain IV access and give 1-3 mg, (0.02 mg/kg for infants) of atropine†* as a bolus, depending on severity. Set up an infusion of 0.9 % normal saline; aim to keep the systolic BP >80 mmHg and urine output >0.5 ml/kg/hr.

- Atropine should not be given IV if at all possible, **in a hypoxic patient** exposed to nerve agent or organophosphates. IV Atropine has regularly produced ventricular fibrillation in test animals in these clinical situations. Give at least the initial dose IM via autoinjector. Regular IM dosing may take 20-25 minutes to have a therapeutic effect.
- Record pulse rate, blood pressure, pupil size, presence of sweat, and auscultatory findings at time of first atropine dose.
- Give pralidoxime chloride**†*** 1- 2 g IV over 20-30 mins (25-50 mg/kg) into a second cannula; follow with an infusion of pralidoxime 0.5-1 g/hr (10-20mg/kg) in 0.9 % normal saline. If drips are unavailable repeat 2PAM Cl dose hourly X 2 PRN, then repeat Q6-12 h PRN.
- Do not give the loading dose too rapidly as it causes vomiting, tachycardia, and diastolic hypertension.
- Five minutes after giving atropine, check pulse, blood pressure, pupil size, sweat and chest sounds. If there has been no improvement, give double the original dose of atropine.
- Continue to review every 5 mins - give doubling doses of atropine if there has been no response. Once parameters have begun to improve, there is no need to double each dose.
- Give atropine boluses until the heart rate is > 80 bpm, the systolic BP >80 mmHg, (See PEDIATRIC VITAL SIGN) values and the chest is clear (while appreciating that atropine will not clear focal areas of aspiration). Sweating usually also stops. A tachycardia is not a contraindication to atropine since it can be caused by many factors. The pupils will commonly dilate; however, this is not a useful endpoint for initial atropinization because there is a delay to maximum effect. However, very dilated pupils are commonly an indicator of atropine toxicity. Test visual acuity.
- Once the patient is stable, start an infusion of atropine giving per hour around 10-20 % of the dose used to initially atropinize the patient. Observe the patient often to see if too much or too little is being given. If too little, cholinergic features will reappear after a while. If too much, patients will become agitated and pyrexial and develop absent bowel sounds and urinary retention. If this occurs, stop the infusion and wait 30-60 minutes for these features to settle before starting again at a lower infusion rate.
- Continue the oxime infusion until atropine has not been required for 12-24 hrs and the patient extubated.

- Continue to review respiratory function. Intubate and ventilate patients when the tidal volume or vital capacity fall below 5 ml/kg or 15 ml/kg, respectively, have apneic spells, or PaO2 <8 kPa (60 mmHg) on FiO2 of >60 %.
  Link to Advanced Life Support reference
- Treatment of seizures - diazepam†* or midazolam‡* should be given to all patients having seizure activity, unconsciousness, diffuse muscle twitching, and if >1 organ is involved. The military gives diazepam as part of initial therapy for any seriously ill NA exposed patients. Utilized early, atropine may function as an anticonvulsant. The benzodiazepines are the most effective seizure medication for nerve agent toxicity. Once seizures are under control, may repeat doses of diazepam or midazolam Q2-4 h PRN. If one benzodiazepine doesn't work initially, try the other. Consider continuous infusion of midazolam, ketamine/anesthesia for non-responsive status. EEG monitoring on a PRN basis.
- Review flexor neck strength regularly in conscious patients by asking them to lift their head off the bed and keep it there when pressure is applied to their forehead. Any sign of weakness is a sign that the patient is at risk of developing peripheral respiratory failure (intermediate syndrome - seen occasionally with organophosphate toxicity/ not associated with nerve agent). The tidal volume should be checked in such patients every 4 hrs. Values less than 5 ml/kg are an indication for intubation and ventilation.
- Treat agitation by reviewing the dose of atropine being administered and giving adequate sedation with benzodiazepines. An antipsychotic, such as haloperidol, can be used but may be less effective for alcohol withdrawal, a frequent co-morbidity in self-poisoned patients. Physical restraint of agitated patients in warm conditions risks severe hyperthermia - this is exacerbated greatly by atropine which inhibits normal thermoregulatory responses, including sweating. Adequate sedation is therefore important.
- Respiratory - bronchospasm - clinically appears like status asthmaticus, pulmonary edema - utilize oxygen, bronchodilators (watch for increased vulnerability to arrhythmias) ventilator etc. - link to ALS
- Cardiac - monitor for arrhythmias - link to ALS
- Fluids, electrolytes, nutrition - children have lower reserves of fluid and are more vulnerable to GI loses, correct acidosis, nursing mothers should pump and discard breast milk until cleared medically.
- Eye care - treat eye pain, miosis (atropine will not reverse miosis).
- Monitor frequently for recurring cholinergic crises due to leaching of fat soluble OPs from fat stores. Such crises can occur for several days to weeks post-

ingestion of some OPs. Patients with recurring cholinergic features will need reloading with atropine.

- While this has not been demonstrated with nerve agent exposure, monitor for the potential development of intermediate syndrome (IMS). This is a syndrome of muscular paralysis occurring in conscious patients typically 24-96 hours (it may occur earlier or later) following ingestion of certain organophosphate agents (following the acute cholinergic syndrome which was treated with atropine). Muscle weakness affects predominantly the proximal limb muscles and those supplied by the cranial nerves. IMS is often associated with respiratory failure.
- Ingestion Exposure - **Do not induce emesis** because of the risk of pulmonary aspiration of gastric contents which may result from abrupt respiratory arrest, seizures, or vomiting. Consideration of decontamination should only be considered after the patient has been stabilized and treated with oxygen, atropine, and an oxime. If the patient is alert and charcoal has not been given previously, administer slurry of activated charcoal (questionable efficacy). If the patient's condition is evaluated within two hours after ingestion of a substantial amount of OP and the patient is fully alert or intubated, consider gastric lavage (some Chinese studies recommend multiple lavages) [Gastric contents should be considered potentially hazardous by skin contact or inhalation and should be quickly isolated].
- Link to Key Acute Care Adult Medications section
- Link to Key Acute Care Pediatric Medications section
- Link to Nerve Agent Treatment - Autoinjector Instructions

Lab Considerations

Discharge and Sample Follow up Instructions

Management of the Deceased

Medical Counter Measures

Missouri CHEMPACK Guidance

NUMO HCC Regional Chempack plans can be found in the EMResource Library.

Individual entities requesting a Chempack asset should notify the DHSS Emergency Response Center and the State Emergency Management Agency to coordinate rapid deliver of the needed resource. This request should be made and first indication of

possible need as for some providers a Chempack could remain a hour or further away. Requesting entities should also simultaneously notify the facility with the Chempack on site.

Mutual Aid agreements can be used for pharmacy resources until chempack and other medical countermeasures can be obtained.

Contingency Medical Countermeasures for Treating Nerve Agent Poisoning

Transportation:

Self-transport to the closest facility should be anticipated for individuals who are able to leave the scene of the incident.

EMS mutual aid will be immediately available, followed by the rostering of EMS strike teams from across the state and region. EMS coordination should be facilitated through the EMS Mutual Aid Coordinator and their established structure. EMS Mutual Aid Coordinators may utilize their own eICS incident and other tools to facilitate the management of EMS resources and share information to the HCC's eICS incident as appropriate.

Demobilization and Recovery:

Demobilization will occur at the direction of the leadership of the primarily impacted HCC entities. Demobilization of resources and entities should be recorded in all applicable eICS incidents as they leave the immediate response. Regional HCC leadership should update eICS event logs or other documentation with the date and time the resources are fully restocked and returned to a "ready to be deployed" status.

The Nonurban HCC and the Regional HCC will provide an opportunity for debriefing and collection of lessons learned to include in their respective HCC After Action Report (AAR) of the incident within 90 days of the initial event.

Prolonged Casualty Care

In any mass casualty situation, patients will need to be continually reassessed and managed according to available resources including space, staffing and medical countermeasures available. The Joint Trauma System offers guidance on the minimum, better and best key treatment aspects for patient care known as prolonged casualty care guidelines. This system provides a helpful framework for contingency and crisis standards of care applications.

The RDHRE 7 maintains a Chemical Response Annex that provides additional information, situational awareness resources and information on how to activate regional, state and federal response systems.

Training and Exercises

The Nonurban HCC will provide initial socialization of the plan and annual review with input and additions as recommended and supported by its HCC members. Efforts will be made to incorporate some components of chemical response care into future exercises and in any full-scale exercises. Hospitals choosing to exercise a facility HAZMAT or chemical response for their training can be supported by their Regional HCC based on the information available in this annex.