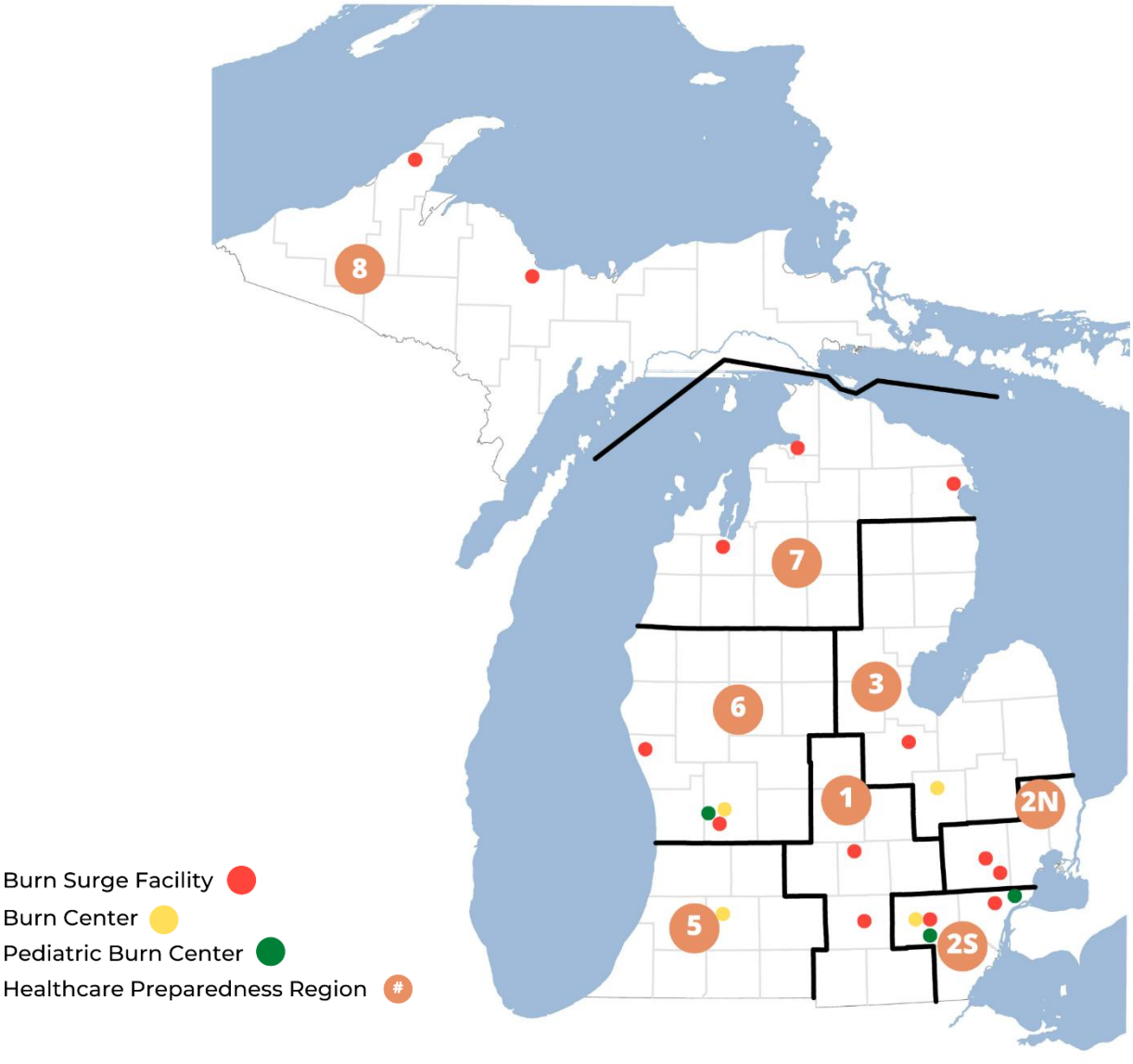
State of Michigan Burn Mass Casualty Incident Plan

Michigan Department of Health and Human Services
Bureau of Emergency Preparedness, EMS and Systems of Care

State Burn Coordinating Center

MDHHS Michigan Department of Health & Human Services | Bureau of Emergency Preparedness, EMS and Systems of Care



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Purpose

The Burn Mass Casualty Incident (BMCI) Surge Plan expands Michigan's capacity to provide stabilizing care to burn patients during large-scale incidents that exceed local or state resources. Recognizing that no single state can meet the needs of a significant burn event, this plan outlines how to safeguard and prioritize limited resources using non-traditional care environments and standardized treatment practices.

Facilities that do not typically provide definitive burn care may be called upon to deliver short-term stabilization. To support this effort, a standardized approach—agreed upon across Michigan—has been developed to ensure consistency in care and resource use, ultimately improving patient outcomes.

The plan introduces Burn Stages to describe incident scope. These stages are intended as planning tools, not rigid protocols. Even small-scale incidents may require assistance from partners to access necessary resources, given the limited national availability of burn beds. The document supports coordinated, regionally led responses but does not prescribe practices for Michigan's verified burn centers.

Silver-impregnated dressings are identified as the preferred wound care strategy due to their long-acting properties, which reduce the time and expertise needed for patient care. The specific brand of dressing remains at the discretion of facilities, but the use of silver dressings is critical to the plan's success in expanding surge capacity.

This plan strengthens burn surge capacity by integrating offsite triage and stabilization to protect definitive care centers from becoming overwhelmed. It is designed to assist local jurisdictions and Healthcare Coalitions (HCCs) in planning for a coordinated, uniform response once local resources are exceeded.

As a supplement to local efforts, this plan defines what constitutes a BMCI and offers regional guidance for assessing current burn care capacity and surge readiness.

Applicable across all levels of government—local, regional, state, and multi-state—it provides guidance for:

- Burn patient triage (see Appendix K)
- Categorization of hospital resources
- Allocation of burn surge supplies based on population and projected needs
- Staff and training readiness
- Communication structures for incident management

The Michigan Department of Health and Human Services (MDHHS) Division of Emergency Preparedness and Response (DEPR) continue to collaborate with HHS Region V partners through the Great Lakes Healthcare Partnership (GLHP) to align planning strategies and surge management approaches across state lines.

Patient injuries in a BMCI will vary in severity and treatment needs. As a planning baseline, MDHHS assumes that 60% of the Health Resources and Services Administration (HRSA) benchmark (50 patients per million population) will sustain ≥30% TBSA burns. This estimate informs surge capacity development.

Finally, it is recognized that federal support may be delayed. As such, Michigan's planning emphasizes both internal preparedness and coordination with regional partners to optimize patient outcomes.

Authority

The Hospital Preparedness Program (HPP) cooperative agreement, as authorized by section 319C-1 of the Public Health Service (PHS) act, as amended by the Pandemic and All-Hazards Preparedness Act (PAHPA)[2] (P.L. 109-417) and the Emergency Medical Services (EMS) and Trauma Systems Section under Part 209 of PA 368 of 1978. Pandemic and All-Hazards Preparedness Act (PAHPA), Public Law No. 109-417 [2,3].

PAHPRA is the Pandemic and All-Hazards Preparedness Reauthorization Act of 2013 (PAHPRA)[4] (Public Law 113-5).1 Bill H.R. 307 was signed into law to reauthorize the Pandemic and All-Hazards Preparedness Act of 2006 (PAHPA) (Public Law 109-417) and to develop new authorities to sustain and strengthen national preparedness for public health emergencies involving Chemical, Biological, Radiological, and Nuclear (CBRN) agents, including emerging infectious disease threats (e.g., pandemic influenza)[4]. Pandemic and All-Hazards Preparedness Reauthorization Act of 2013 (PAHPRA), Public Law 113-5.

PAHPAIA is the Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019 (Public Law 116-22)[5]. Bill H.R. 269/S1379 was signed into law reauthorizing the Pandemic and All-Hazards Preparedness Act of 2006 (PAHPA) (Public Law 109-417). This new law is comprehensive and provides programs with opportunities to improve preparedness and responses, strengthen the emergency response workforce and strengthen the National Health Security Strategy. Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019 (PAHPAIA), Public Law 1116-22

[2] http://www.phe.gov/preparedness/legal/pahpa/pages/default.aspx. Accessed July 3, 2023
[3] http://www.phe.gov/Preparedness/legal/pahpa/Pages/pahpra.aspx. Accessed July 3, 2023
[4] http://www.phe.gov/Preparedness/legal/pahpa/section201/Documents/section201-guidance.pdf. Accessed July 3, 2023
[5] https://www.phe.gov/Preparedness/legal/pahpa/Pages/pahpaia.aspx. Accessed Jule3, 2023

Definition of a Burn Mass Casualty Incident

For the purposes of this plan, qualitative factors that may cause a local jurisdiction to declare an emergency or disaster may include, but are not limited to mass casualties involving:

- Inhalation injuries
- Size, depth and location of the burn area
- Chemical or radiological contamination/exposure
- Presence of other trauma related injuries which compound the intensity of care and resources required for ongoing patient care
- Casualty transport resources
- Co-existence of other major Burn Mass Casualty Incidents in other areas of the State or multi-state region

A **Burn Mass Casualty Incident (BMCI)** is an event where the number and severity of burn injuries exceed the immediate capacity of local or regional healthcare systems to provide definitive burn care.

These incidents may involve:

- High numbers of casualties with ≥30% Total Body Surface Area (TBSA) burns
- Inhalation injuries or chemical/radiological exposures
- Combined trauma and burn injuries
- Limited or delayed access to burn center beds
- Situational impacts such as multiple concurrent MCIs or regional disasters

BMCI severity is classified into three **Burn Stages** (I–III), based on the number of patients, resource availability, and transport feasibility (see Table 1 for detailed definitions). These stages guide the activation of Burn Surge Facilities (BSFs), use of out-of-region resources, and coordination through the State Burn Coordinating Center (SBCC) and CHECC.

Table 1: Burn Mass Casualty Incident (BMCI) Stages

Mass Casualty	Definition	Plan
Stage I	**Any event in which local trauma/burn resources are overwhelmed with patients (example: 10-24 patients):** • Have ≥30% TBSA burn • Meet Burn Center Referral Criteria *(Appendix F).* • Qualitative or quantitative nature of injuries exceed local capacity to provide effective care.	• Individual health care facilities will manage the patients. • Regional MCC will communicate with MDHHS CHECC who contacts the SEOC with the SBCC. • The CHECC will communicate with the SBCC who provides consultation and coordinates bed availability for the impacted healthcare facilities. • State burn centers and burn centers in neighboring states near the incident will manage as many patients as resources permit. Burn patients are defined at those casualties that meet Burn Center Referral Criteria *(Appendix F).* • BSFs may be utilized as needed to briefly care for patients until transferred to a recognized burn center.
Stage II	**Any event in which regional trauma/burn resources are overwhelmed with patients (example: 25 – 100 patients):** • Have ≥ 30% TBSA burn • Qualitative or quantitative nature of injuries exceeds defined capacity of the region.	• Individual health care facilities will manage patients. • Regional MCC will communicate with MDHHS CHECC, who contacts the SEOC, with the SBCC. • The CHECC will communicate with the SBCC who provides consultation and coordinates bed availability for the impacted healthcare facilities. • State burn centers in neighboring states near the incident will manage as many patients as resources permit. Burn patients are defined at those casualties that meet Burn Center Referral Criteria *(Appendix F).* • BSFs may be utilized as needed to briefly care for patients until transferred to a recognized burn center. • If existing burn center resources are exhausted, patients will be referred utilizing process outlined in Burn Stage III (see below).
Stage III	**Any event in which state trauma/burn resources are overwhelmed with patients (example: > 100 patients or the potential to have > 100 patients exist):** • Have ≥ 30% TBSA burn • Qualitative or quantitative nature of injuries exceeds defined capacity of the state.	• Individual health care facilities will manage patients. • Regional MCC will communicate with MDHHS CHECC who contacts the SEOC, with the SBCC. • CHECC in coordination with SEOC supports local MCC and EOCs, respectively. • SBCC assists BSFs and works with MCCs and CHECC to facilitate coordination of other burn resources with Great Lakes Healthcare Partnership (GLHP) and the American Burn Association (ABA) national network of burn centers. • State burn centers will manage as many patients as resources permit who meet Burn Center Referral Criteria *(Appendix F) and* assist near-by BSFs as able. • If ABA is unavailable or transport is not feasible, BSFs will be utilized to house patients. BSFs will care for and house patients until transport to a more distant burn center can be achieved (preferably within 72 hours). If needed, patients may be transferred to more distant BSFs in Michigan and neighboring states.

Concept of Operations

During a Burn Mass Casualty Incident (BMCI), Michigan's 15 Burn Surge Facilities (BSFs) are expected to provide initial treatment and stabilization for patients requiring referral to a burn center. Capacity planning should assume 50 casualties per million population or a minimum of 25 patients. To support this, BSFs must prepare non-traditional burn care resources, including:

- Training in burn triage and injury categorization
- Patient care procedures
- Supply caches to support at least 72 hours of care

An effective statewide response depends on four core operational components:

1. Regional Medical Coordination Centers (MCCs), serving as Multi-Agency Coordination Systems (MACS)
2. A designated State Burn Coordinating Center (SBCC)
3. Full utilization of Michigan's six burn centers
4. Establishment and readiness of regional BSFs

These elements enable regions to manage patient care and transfers during a BMCI. Once an MCC assesses the incident scope and patient needs, it will contact the CHECC for coordination and assistance, including patient placement and burn resource support.

The Essential Elements of Information (EEI) submitted to CHECC (Appendix E) may include:

- Estimated number of impacted patients
- EMResource bed query status
- Communications from local EOCs on health needs
- MCC activation status, staffing, and relevant situational details

Upon notification of a potential BMCI, the CHECC will assess the incident's scale and statewide impact based on input from local and regional partners. If warranted, the CHECC will activate and coordinate with the State Burn Coordinating Center (SBCC) to evaluate burn bed availability and determine whether to activate the BMCI Surge Plan and notify the SEOC.

Once activated, the CHECC and SBCC formalize communications and coordinate statewide response. The SBCC uses Initial Casualty Reports (Appendix P) to assign a Burn Stage:

- Burn Stage I: Local trauma/burn resources overwhelmed (e.g., 10–24 patients)
- Burn Stage II: Regional trauma/burn resources overwhelmed (e.g., 25–100 patients)
- Burn Stage III: Statewide burn capacity exceeded (e.g., >100 patients)

Additional factors include incident location, patient acuity, transport time, and bed availability.

Activation of a BSF is guided by criteria outlined in this plan. The SBCC manages in-state and interstate resources and supports BSFs, burn centers, and transport coordination.

Following activation, SBCC responsibilities include:

- Deploying Michigan Medicine's internal disaster team
- Notifying the ABA to identify out-of-state burn center capacity
- Activating in-state BSFs in coordination with CHECC
- Coordinating triage and transfers to in-state, regional, or out-of-state burn centers and BSFs
- Supporting BSFs during the initial 72 hours of care
- Coordinating pediatric transfers to burn centers as beds become available
- Working with MCCs and CHECC to track and transfer patients to out-of-state centers
- Communicating with partner SBCCs within the GLHP for multi-state coordination

Organizations and Assignment of Responsibilities

Regional Medical Coordination Centers (MCC)

MCCs serve as the regional coordination hub for healthcare resource management during a BMCI. Their responsibilities include:

- Supporting local hospitals, EOCs with situational awareness and medical coordination
- Serving as the regional conduit for medical resource requests and communications with the CHECC
- Assisting in coordination of burn patient triage, placement, and transport

State Burn Coordinating Center (SBCC)

MDHHS Bureau of Emergency Preparedness, EMS and Systems of Care (BEPESoC) has contracted with one healthcare facility to act as the SBCC. Housed at the University of Michigan Health, it provides state-level support for burn coordination. Key duties include:

- Coordinating in-state and interstate burn bed availability
- Facilitating patient triage, transfers, and consultation with burn centers and BSFs
- Deploying telemedicine or in-person clinical support teams if needed
- Maintaining protocols, burn triage tools, and supply cache oversight
- Liaising with ABA and HHS Region V partners during multistate incidents

Both the SBCC and MCCs support BSFs in delivering 24–72 hours of burn stabilization care, pending transfer to a definitive burn center.

In considering a facility for selection as the SBCC the following capabilities are considered as criteria for designation:

- ABA verification as a burn center.
- Around-the-clock on call coverage by a burn surgeon and burn disaster response support team.
- Ability to serve in the role and continue to care for patients (under catastrophic conditions).
- Telemedicine capabilities.
- Interoperable communications that include State of Michigan 800 MHz radio.
- Michigan Health Alert Network (MIHAN) participation.
- The SBCC has web publication capabilities. This resulted in the *Emergency Burn Triage and Management* web page found at www.MichiganBurn.org. This resource is open to all but contains a restricted site for management of patient fluid resuscitation during a BMCI.

To further support Michigan's plan for a BMCI, the SBCC has duties outside of incident response including:

- Act as a liaison with coordinating burn centers from other states including the GLHP, on an ongoing basis, in support of inter-state planning activities.
- Assist in the development of training protocols for personnel at designated BSFs, burn centers and EMS.
- Assist with education, training and exercises.
- Develop and maintain a process for recording burn casualty reports associated with an MCI in which they are activated.
- Coordinate the maintenance and updating of burn related protocols at the BSF and regional HCCs.
- Coordinate the rotation and updating of burn supply caches located within BSFs or other central locations.
- Coordinate the procurement of critical burn surgery supplies, such as skin Allograft and wound care products. Maintain a database of supply sources and contacts.
- Work with suppliers outside the state and coordinate supply distribution to other in-state burn centers.
- Demonstrate proficiency in the utilization of the MIHAN as well as other web-based resources to facilitate distribution of documents, protocols and databases needed for BMCI preparedness.
- Demonstrate proficiency in the use of the 800 MHz radio.
- Maintain documentation for potential reimbursement.

Michigan Burn Centers

Michigan currently has five healthcare facilities recognized as burn centers *(Appendix N)* by the ABA. They routinely accept burn referrals and can provide definitive care for burn patients, as defined by the American Burn Association[9]. During a BMCI, these centers will continue to serve their primary role but will work in conjunction with the SBCC to manage the flow of burn surge patients and ensure optimal use of the state's definitive burn care capacity.

Burn Surge Facilities

The eight regional HCCs, working with the DEPR have established 15 hospitals to serve as a BSFs (Appendix M) strategically located throughout the eight regional HCCs (Appendix W).

Each regional HCCs with an ABA burn center has identified one BSF, with the exception of Region 2 South and Region 6. Region 2 South's population density requires the two BSFs in addition to the three burn centers. Region 6 has a growing population density that warrants two BSFs. The regions without a burn center identified at least two BSFs. The identification of these BSFs allowed for the development and education of staff within the HCO who may not typically treat burn patients beyond initial stabilization and transport, training them to provide care for the initial 24-72 hours post incident.

BSFs are hospitals that can care for burn patients based on the three defined Burn Stage (BS) responses:

Burn Stage I

- Any event in which local trauma/burn resources are overwhelmed with patients (example: 10-24 patients).

Burn Stage II

- Any event in which regional trauma/burn resources are overwhelmed with patients (example: 25-100 patients).

Burn Stage III

- Any event in which state trauma/burn resources are overwhelmed with patients (example: greater than 100 patients).

Each burn surge stage has been created based either on an analysis of existing burn resources currently in existence within each HCC or on the enhancement of the resources provided within this plan. The burn stages are linked to the HCC through the MCC's ability to respond to the burn stage with available resources. Assistance from other HCCs may be necessary and would be designated through collaboration between the SBCC and the CHECC.

[9] American Burn Association. (n.d.). *The burn center*. https://www.ameriburn.org/patients/the-burn-center

Given the expectation that established state burn centers may initially be overwhelmed and transportation limited, BSFs would be responsible for the initial evaluation and stabilization of burn patients during the initial 72 hours and preparation for transfer, if necessary. BSFs should have 24-hour coverage with at least 15 nurses and 5 physicians or Advanced Practice Providers trained at a minimum in American Burn Life Support (ABLS). Patients treated and discharged by BSFs should be referred to a burn center for complications and any needed long-term follow-up.
Michigan has supported the ABLS education statewide for Burn Surge Facilities, EMS, and other healthcare providers by offering ABLS Now on-line free of charge for those working in Michigan Healthcare Organizations. For more information on the ABLS Now On-line program go to: ABLS Now Course – American Burn Association (ameriburn.org).

BSF Basic Selection Criteria:

- BSFs are preferably Level I or II trauma centers. Telemedicine capabilities are desirable.
- In absence of a Level I or II trauma center, BSFs should, at a minimum, meet the general requirements of a Level III trauma center.
- BSFs must have 24-hour nursing care for burn patients. Enough nurses and physicians should be ABLS-trained such that an ABLS-trained nurse or physician should (at a minimum) be able to lead the care provided to patients.
- Each BSF should have at a minimum 15 nurses and 5 ABLS-trained physicians available during a BMCI.
- During a BMCI, BSFs will function as the initial triage, stabilization, resuscitation, and transport staging center with support of the region's MCC and the CHECC.

All eight HCCs have at least one ACS verified Level I or II trauma center that is not a burn center but is well suited to provide this level and complexity of patient care. The goal is a multilateral increase in short-term capabilities across the regions, state, and ultimately throughout the GLHP. It is expected that the BSFs will need to care for some burn patients during the initial 72 hours to ensure the Michigan burn center resources are identified for the highest acuity burn casualties. The BSF will receive distance consultation support from the SBCC during this phase. All BSFs in the state should be prepared to receive burn casualties as triaged by the SBCC (Appendix L).

Patient Treatment Recommendations within the BSF

A BMCI will stress all impacted hospitals. Care is focused on initial stabilization to include:

- Airway, Breathing, Circulation (ABCs)
- Determining the total body surface area (TBSA) burned (Appendix H)
- Fluid resuscitation (Appendix J)
- Pain management
- Wound care, with priority placed on minimizing patient pain and infection potential and decreasing time demands on healthcare staff until definitive burn care is available.
    - Wound care will typically be limited to the application of Mepilex Transfer Ag (a silver based long-acting dressing). This type of dressing can be applied to burn wounds and left on without having to change them for seven days (except facial burns).
    - Similar burn wounds as well as grossly contaminated wounds will require more frequent daily dressings with silver sulfadiazine cream (Silvadene) or other anti-microbial preparations.
    - Facial burns will be treated with the anti-bacterial ointment (Bacitracin/Neosporin) that the facility has on hand.
    - Scalp and facial hair should be shaved daily.
    - Scalp wounds should be covered with silver sulfadiazine (Silvadene) cream.

(For complete assessment and treatment recommendations, refer to *Appendix I)*

Patient Transport

A critical component of any MCI response is the availability of patient transport to definitive care facilities. Planning must include sufficient redundancy to manage multiple simultaneous transfers during a BMCI.

MDHHS DEPR and regional HCCs are developing Ambulance Strike Teams and other casualty transport systems (CTS) to support this need. In a Burn Stage I event, local EOCs may request deployment of regional Ambulance Strike Teams by their HCC Preparedness Plan. For Burn Stage II or III events, deployment should be coordinated through the MCC, CHECC, and SEOC.

Burn Stage II or III incidents may also require activation of the National Disaster Medical System (NDMS), which enables patient movement nationwide via military aircraft and supports care through deployed Disaster Medical Assistance Teams (DMATs). The CHECC, in collaboration with SEOC, leads NDMS coordination and works with MCCs and local EOCs to ensure a timely and effective response.

Documentation of Casualties

Accurate documentation is essential to avoid overwhelming BSFs and to guide patient care and post-incident review. The following forms and the BMCI database will be used:

- Essential Elements of Information (Appendix E)
- Initial Burn Casualty Report (Appendix P)
- Follow-up Burn Casualty Report (Appendix Q)
- BSF Casualty Census (Appendix R)

The SBCC reviews all documentation to support ongoing care coordination and after-action reporting. Transferred patients must have required paperwork as outlined in Appendix S.

For ground transport over two hours, EMS must use the MI-Burn EMS Inter-Facility Transfer Note (Appendix T). This form supports patient stability during transit, includes contact information for burn centers, and offers a medication/supply worksheet. It also provides a clinical summary for the receiving facility, including vitals, medications, airway and ventilator status, and intake/output details.

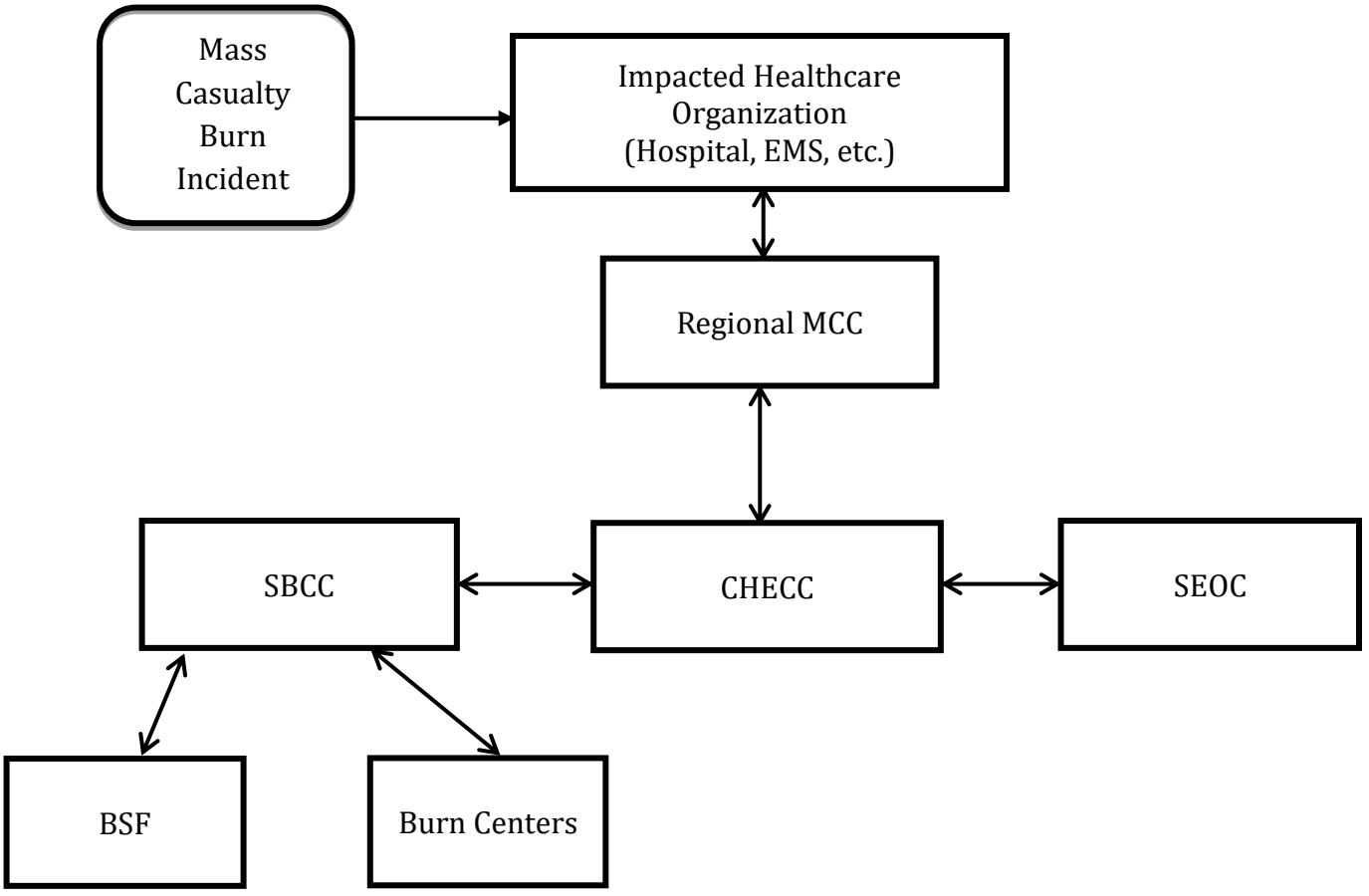
Summary

This revised State of Michigan BMCI Surge Plan and its appendices provide the framework and guidelines for a response to a burn mass casualty incident. This plan is reviewed on a routine cadence. It guides the user through the necessary steps to activate the SBCC, assess patients, and calculate TBSA, as well as provides resuscitation protocols for hospitals treating burn patients. Casualty information sheets are included in the appendices of this plan to provide the SBCC with data to determine transfers based on patient criticality. The EMS Inter-facility Transfer Sheets provide not only accurate and up to date information on a patients' condition and treatment, but also a helpful worksheet to assist in calculating transport times (greater than 1 ½ hours), fluid, oxygen and medication needs for the transport.

Appendices

Appendix A

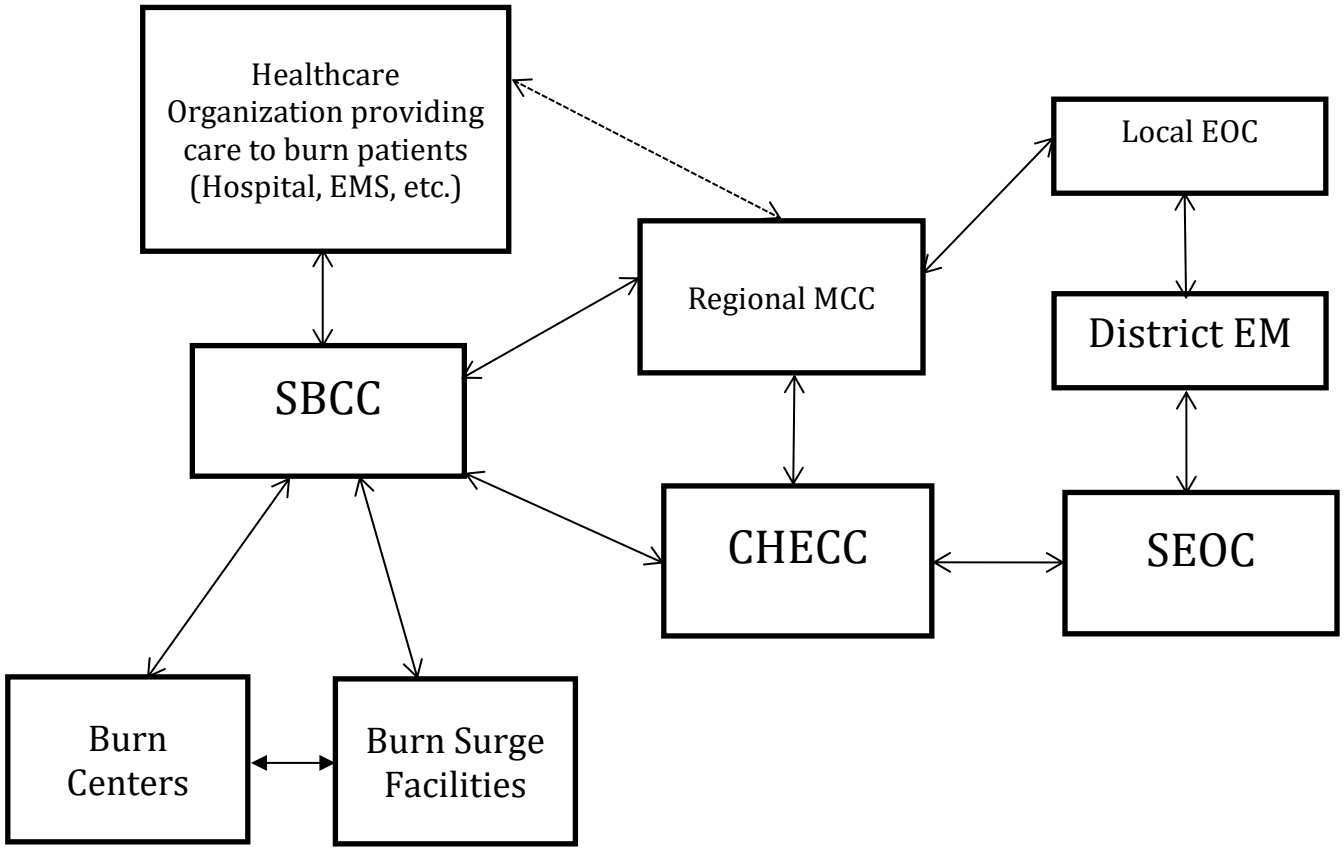
SBCC Activation Communications Pathway



BSF – Burn Surge Facility
CHECC – Community Health Emergency Coordination Center
EMS – Emergency Medical Services
MCC – Medical Coordination Center
SBCC – State Burn Coordinating Center
SEOC – State Emergency Operations Center

Appendix B

On-going Notification Communications Pathway

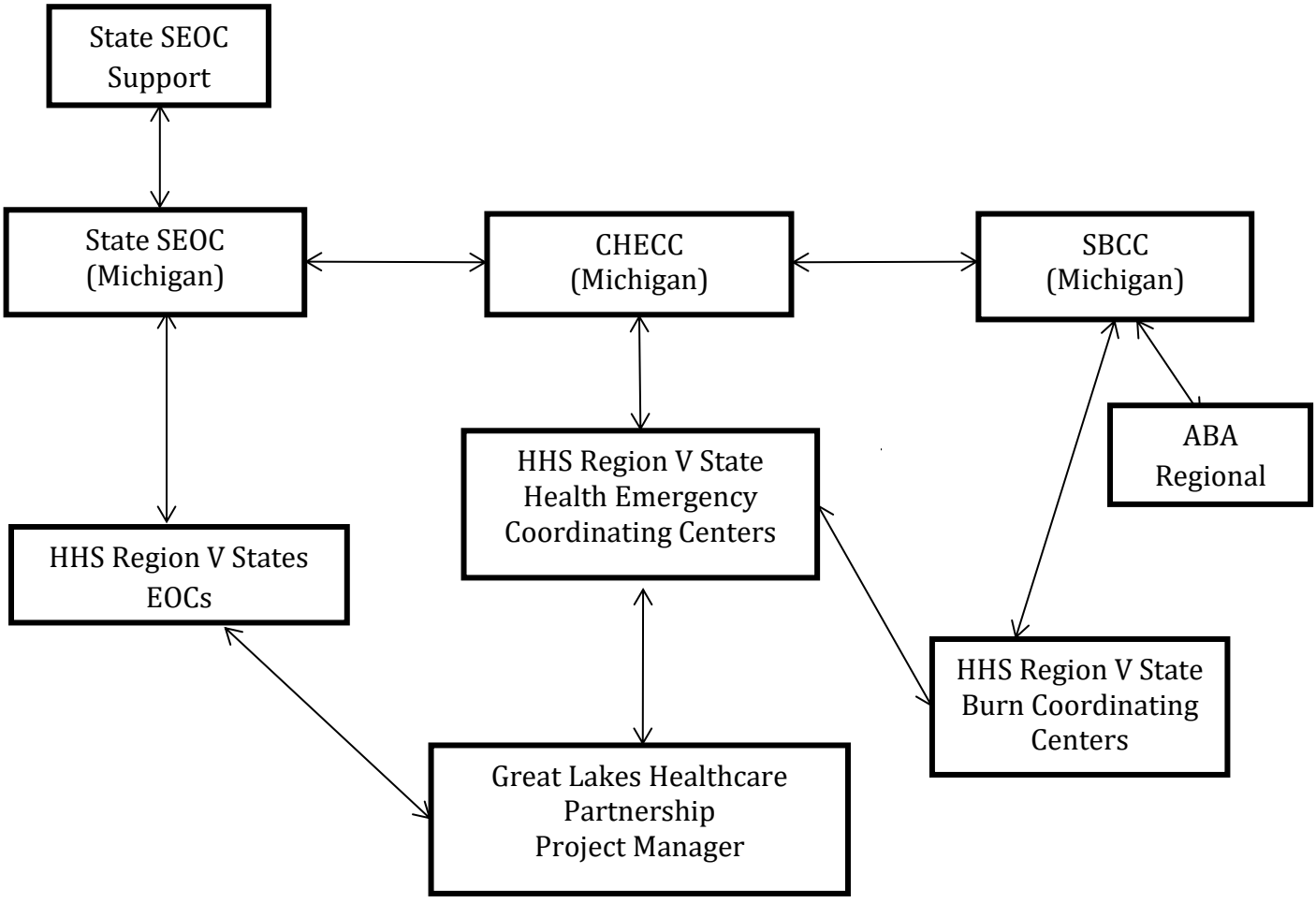


The dotted line ⟷ indicates communication between the impacted entity and the MCC

CHECC – Community Health Emergency Coordination Center
EM – Emergency Manager
EMS – Emergency Medical Services
EOC – Emergency Operations Center
MCC – Medical Coordination Center
SBCC – State Burn Coordination Center
SEOC – State Emergency Operations Center

Appendix C

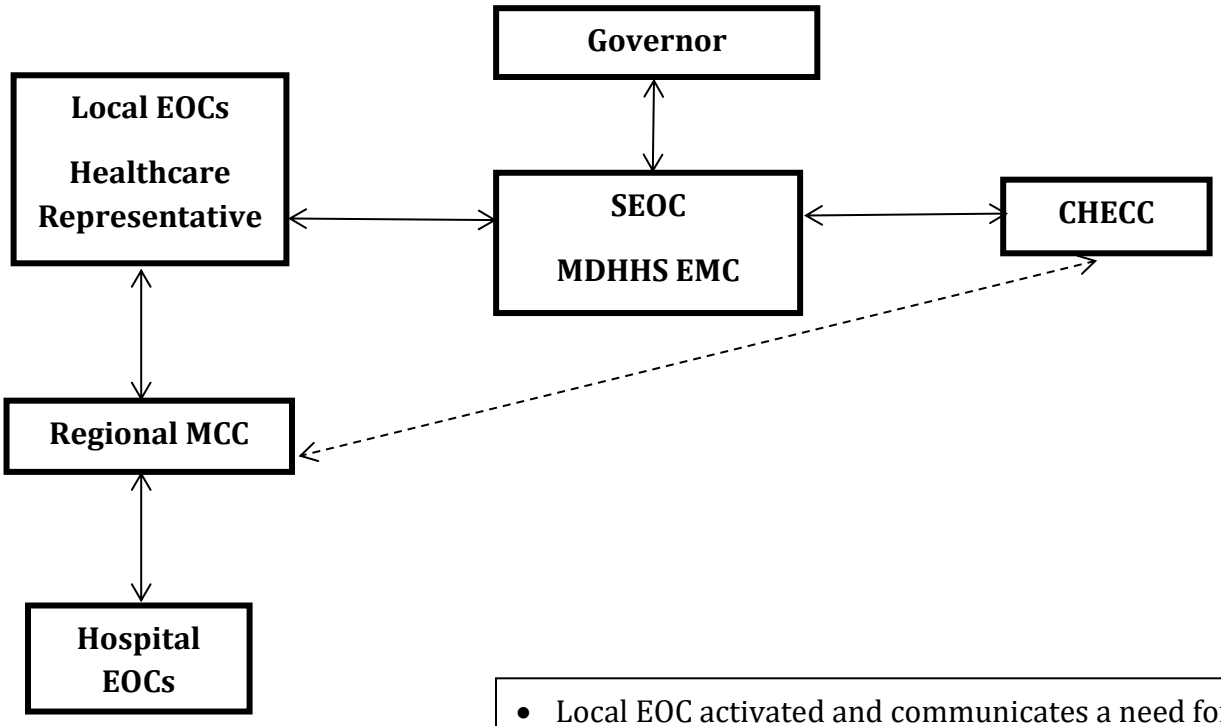
Communication Pathway with the Great Lakes Healthcare Partnership When Burn Capacity Exceeds Michigan Resources



CHECC – Community Health Emergency Coordination Center
HHS – Health and Human Services
SBCC – State Burn Coordinating Center
SEOC – State Emergency Operations Center

Appendix D

Medical Communications Pathway During Emergency Response



- Local EOC activated and communicates a need for medical/public health resources to SEOC
- MDHHS EMC communicates needs to CHECC
- CHECC communicates with medical/public health subject matter experts to obtain information. Must include local public health department and Regional MCC
- The hospital EOC communicates status of the hospital resources to the regional MCC
- Regional MCC provides this information as requested to the local EOC healthcare representative

CHECC – Community Health Emergency Coordination Center
EOC – Emergency Operations Center
EMC – Emergency Management Coordinator
MCC – Medical Coordination Center
MDHHS – Michigan Department of Health and Human Services

Appendix E

Elements of Essential Information (EEI) Report

Burn Mass Casualty Incident Surge Plan

***** URGENT ***** URGENT ***** URGENT ***** URGENT *******

Information necessary to provide to the MCC upon requesting assistance from the State Burn Coordinating Center

CHECC Duty Officer: 517-819-0391

Date: _____ Time of Call: _____ Deployed Agency Fax #_____

Essential Elements of Information Report	
1. Requesting Facility/Agency *Authorized Agencies:* • Hospitals Emergency Operations Center • Representative from BETP • Regional Healthcare Coalition Coordinator • Regional Healthcare Coalition Medical Director	Name: _____ Title: _____ Facility/Agency: _____ Call Back #(s): _____ Resource(s) Requested: □ **Burn Surge Supply Kit** □ **Pediatric Surge Supply Kit**
2. Physician / Officer in Charge of Medical Management at the Facility/Scene **(If different from "1." above)**	Facility: _____ Name: _____ Position/Title: _____ Telephone #(s): _____
3. Location of Incident (If applicable)	Jurisdiction Name: _____ Deployment Location: _____ Or Delivery Point: _____
4. Estimated Number of Casualties	Pediatric Infant Adult
5. Number Intubated	Pediatric Infant Adult
6. Types of Injuries	Fire Thermal Chemical Explosion
7. Hot zone/Environmental Hazards	No Yes (Description): _____ _____ Decontaminated: Yes No

Appendix F

Burn Center Referral Criteria Mass Casualty Incident

The criteria listed below should be viewed as guidance to medical staff in determining which patients should be considered for the cohort for transfer to a recognized burn center during a BMCI. *It should be noted that these criteria represent a departure from recommended considerations for situations that do not involve a BMCI.*

BURN CENTER REFERRAL CRITERIA (Stage II/III Mass Casualty)

1. Partial thickness burns greater than 40% of the total body surface area (TBSA).
2. Circumferential full-thickness burns involving an extremity.
3. Full thickness burns greater than 5% TBSA.
4. High voltage (>1000 volt) electrical burns.
5. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality.

Based on excerpts from Guidelines for Burn Patient Referral *(*Appendix G).

Note Regarding Inhalation Injury: It is expected during Stage III (and possibly stage II) incidents that Intensive Care Unit (ICU) bed capacity at burn centers and BSFs will be overwhelmed during the initial period. In the absence of cutaneous burns that meet referral criteria, casualties with only smoke inhalation can be managed at any ICU-equipped and ventilator capable medical facility.

Appendix G

American Burn Association Burn Unit Referral Criteria

Note: These criteria should be applied in situations where the incident does not result in a sufficient number of patients, based on either quantitative or qualitative measures, to be considered a BMCI.

BURN CENTER REFERRAL CRITERIA [10]

1. Partial thickness burns greater than 10% TBSA.
2. Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
3. Third-degree burns in any age group.
4. Electrical burns, including lightning injury.
5. Chemical burns.
6. Inhalation injury.
7. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality.
8. Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be initially stabilized in a trauma center before being transferred to a burn unit. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.
9. Burns in children. Children with burns should be transferred to a burn center specializing in pediatric burn care. In the absence of a regional pediatric burn center, an adult burn center may serve as a second option for the management of pediatric burns.

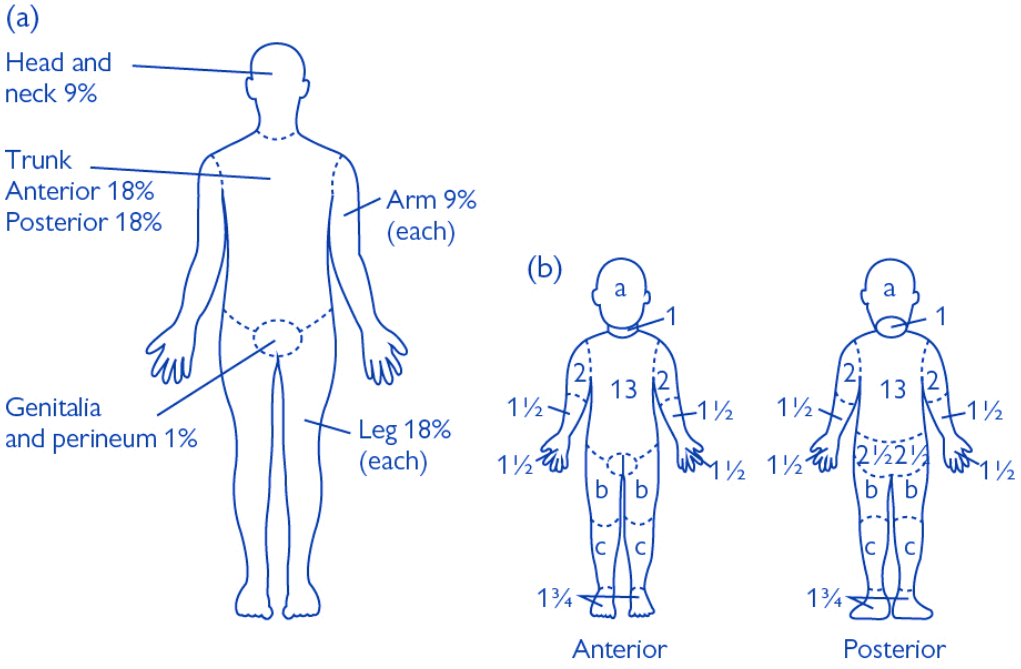
[10] Guidelines for Burn Patient Referral (https://www.ameriburn.org/burn-care-team/resources/guidelines-for-burn-patient-referral) Accessed March 10, 2026.

Appendix H

The Rule of Nines – Lund-Browder Charts

The Rule of Nines *(Panel A)* is often used to estimate the surface area of a burn in adults. However, this approach is less accurate in children. Lund-Browder charts *(Panel B)* use values for the legs and head that vary according to a patient's age.

Chemical Burns: Hydrofluoric acid burns should be treated with calcium gluconate.



Relative percentage of body surface area (% BSA) affected by growth

	Age				
Body part	0y	1y	5y	10y	15y
a = ½ of head	9½	8½	6½	5½	4½
b = ½ of one thigh	2¾	3¼	4	4¼	2½
c = ½ of one lower leg	2½	2½	2¾	3	3¼

Rule of the Palm (Palm = 1%)
(Palm of Patient's Hand)

1% =	

Appendix I

Burn Surge Facility Treatment Considerations: Responsibilities during a Burn Mass Casualty Incident

Provide Initial First Aid:

A. Stop the burning process.
B. Use standard precautions.
C. Remove clothing or jewelry.
D. Cool any burns that are warm to touch with tepid water and then pat dry.
E. Rinse liberally with tepid water if chemicals are suspected according to protocols, then dry.
F. Cover with clean DRY sheet or bedding to prevent hypothermia.

Perform Primary Survey

A. Airway Maintenance with Cervical Spine Protection:

1. Chin lift/jaw thrust with cervical spine precautions as needed.
2. Assess for signs of airway injury such as hypoxia, facial burns, carbonaceous sputum, stridor and nasal hair singeing.
3. Assess the history of a closed space fire.
4. Insert an oral pharyngeal airway or endotracheal tube (ETT) in the unconscious patient (intubate early).

B. Breathing and Ventilation:

1. Assess the appropriate rate and depth of respirations with adequate air exchange.
2. 100% (12-15 lpm) Fractured Inspired Oxygen (FiO2) non-rebreather face mask or endotracheal intubation until Arterial Blood Gas (ABG) result.
3. ABG with Carboxyhemoglobin (COHgb) level is required for suspected inhalation injury.
4. COHgb levels are decreased by ½ every 40 Minutes while on 100 % hi-flow FiO2. (COHgb level goal is <10 %.)
5. Mechanical ventilation as needed.
6. If extensive facial burns or greater than 40% TBSA, intubation for airway protection prior to expected facial swelling is indicated.
7. Monitor pulse oximetry while checking COHgb level (as needed). (***Note:** CO displaces O2 on the hemoglobin causing a false 100% pulse oximetry reading, until CO levels are normal.)
8. Head of bed (HOB) elevated.

C. Circulation with Hemorrhage Control:

1. Vital Signs
    a. Heart rate
    b. Blood pressure
    c. Capillary refill
    d. Temperature
    e. Skin color of unburned skin
2. Cardiac monitoring as needed
    a. May be needed if there is an electrical injury, concurrent trauma, or cardiac issues
3. Oral resuscitation can be used in the following patients:
    a. Patient is not intubated
    b. Injury is not electrical
    c. No other injuries
4. Heplock IV (as needed) if taking adequate fluids by mouth.
5. If patient is intubated:
    a. Start maintenance fluids – large bore peripheral IV in non-burned, upper extremities
    b. Place a soft feeding tube (preferably post-pyloric)
6. Initiate resuscitation fluids as soon as possible using ABA guidelines.
7. Pediatric patients with burns > 10% TBSA require resuscitative fluids and maintenance fluids.
8. Pediatric patients less than 10 kg require Dextrose 5% in Lactated Ringers (D5LR) at maintenance rate if not taking adequate by mouth (PO) or are intubated. Pediatric calculation for maintenance fluid formula:
    a. For the first 10 kg of body weight: 4 mL per kg per hour
    b. For the second 10 kg of body weight: 2 mL per kg per hour
    c. For the remaining kg of body weight up to 30kg: 1mL per kg per hour
9. Labs on admission and then as dictated by medical condition
    a. Arterial Blood Gas (ABG)
    b. Carboxyhemoglobin (COHb) level, always add this to a blood gas
    c. Electrolyte panel
    d. Complete Blood Count (CBC)
    e. Cardiac panel for electrical injuries
    f. Electrocardiogram (EKG) for electrical injury or cardiac history
    g. Chest X-Ray if intubated, inhalation injury suspected or underlying pulmonary condition
    h. Tetanus prophylaxis unless given in the last 5 years

D. Disability:

1. Neurologic checks every 4-8 hours and prn
    a. Goal is an alert and oriented patient
    b. If altered neurological status, consider the following:
        i. Associated injury

ii. CO poisoning
iii. Substance abuse
iv. Hypoxia
v. Pre-existing medical condition

2. Determine level of consciousness. Consider using the “AVPU” method:
    a. A- Alert
    b. V- Responds to verbal stimuli
    c. P- Responds to painful stimuli
    d. U- Unresponsive

E. Exposure:

1. Remove all clothing and jewelry
2. Initially place a clean, dry sheet over the wounds until a thorough cleaning is done
3. Keep patient normothermic, especially during wound care, by:
    a. Keeping patient covered
    b. Covering the patient’s head
    c. Warming the room
    d. Warming IV fluids
    e. Using bairhuggers or similar external warming devices

Secondary Survey

A. History:

1. Obtain circumstances of injury
2. Obtain medical history

A – Allergies
M – Medications
P – Previous illness, past medical history
L – Last meal or fluid intake
E – Events/environment related to the injury

B. Complete Physical Examination:

1. Head to toe exam
    a. If eye involvement or facial burns, consult an Ophthalmologist.

2. Determine extent/size of the burn by calculating the TBSA burn using one of the following methods:

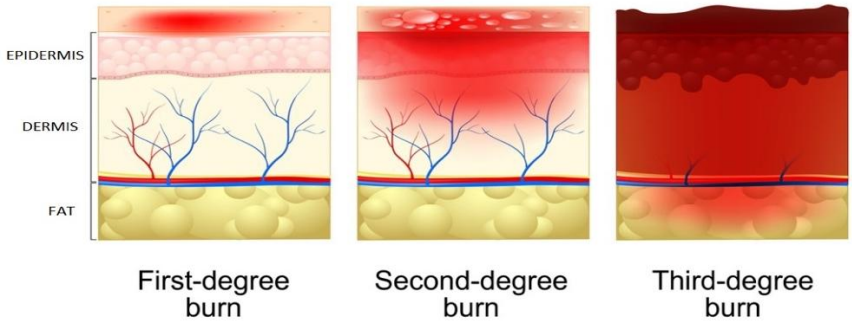
    a. Rule of Nines
    b. Lund- Browder chart

c. Rule of the Palm (Palm = 1%)

3. Determine the depth of the burn

a. DO NOT include Superficial (1st degree) burns when calculating TBSA
b. Superficial partial thickness (2nd degree)
    i. Involves the epidermis and a thin layer of dermis
    ii. Red, blistered, moist, blanches
c. Deep partial thickness (2nd degree)
    i. Involves the entire epidermis and variable portion of the dermis
    ii. Red, blistered and edematous
d. Full thickness (3rd degree)
    i. Involves the destruction of the entire epidermis and dermis
    ii. White, brown, dry, leathery with possible coagulated vessels

Degree of Burns



Fourth-degree burns

- Destruction of entire skin and subcutaneous fat with any underlying tendons

C. Assess Need for Escharotomies:

Monitor the following signs and symptoms in deep partial or full thickness, circumferential burn injuries which may indicate a circulation deficit requiring decompression by incision of burn wound:

1. Cyanosis of distal unburned skin on a limb
2. Unrelenting deep tissue pain
3. Progressive parathesis
4. Progressive decrease or absence of pulses
5. Inability to ventilate in patients with deep circumferential burns of the chest

D. Comfort:

1. Frequent pain/sedation assessment
    a. Every hour
    b. Before and after pain/sedation medications given
2. Use age-appropriate pain scales for pediatric patients

3. Give whatever pain medication is required and available (IV is the preferred route in TBSA >20%)
    a. Narcotic/Analgesic IV/PO
    b. Ativan/Versed IV/PO

E. Wound Care:

1. Assess and monitor the wound for:
    a. Change in wound appearance
    b. Change in size of wound
    c. Signs or symptoms of infection
2. Wound care should include:
    a. Washing the wounds with soap and warm tap water using a washcloth
    b. Remove water by patting dry
3. Wound care related to the face and scalp should be performed every day and use the following:
    a. Silver sulfadiazine (Silvadene) cream (scalp)
    b. Bacitracin (face)
    c. Scalp and facial hair should be shaved daily
4. All blisters should be debrided, except for the following:
    a. Intact blisters on hands and feet. The exception would be if the blister is impeding range of motion to the joints
5. Ears are poorly vascularized and at risk of chondritis
    a. Topical sulfamylon cream should be used; if unavailable, use Silvadene
    b. Make sure to plug the ear canal due to the toxicity of sulfamylon to the auditory canal
    c. Avoid external pressure including pillows and constrictive dressings to ears and nose
6. For extensive and severe burns to the face:
    a. Apply a thin layer of Silvadene cream, approximately a nickels thickness or enough to cover the wound, so that it doesn't dry out prior to the next dressing change. Cover with a fine mesh gauze dressing and finish the wrap with dry gauze dressing. The purpose of the gauze dressing is to keep the cream from rubbing off before the next dressing change
    b. Avoid creams near the eyes.
7. For moderate facial burns:
    a. Bacitracin or another antibiotic ointment without dressing can be used
8. If fingers and toes are burned:
    a. Dress and wrap separately to promote range of motion and prevent webbing of the digits
9. Genitalia and perineal burns require:
    a. A greasy gauze and/or lubricant between the labia and in the foreskin to prevent adhesions
    b. A foley is never indicated to maintain patency
    c. A foley should be used to monitor urine output in the severely injured

patients

10. Elevate burned extremities above the level of the heart to minimize edema
11. If applying a Mepilex Transfer Ag* dressing:
    a. Remove the film barrier from the surface of the Mepilex Transfer Ag.
    b. Place over wound bed. The piece should overlap the wound bed by at least 2 cm onto the surrounding intact skin. Apply the sticky side down. Do not stretch.
    c. If necessary, secure with wrap of Kerlix or ACE bandage
    d. Dressing does not need to be changed for 5-7 days
        i. The overlying gauze can be changed as necessary
        ii. If signs of infection appear, remove dressing to assess wound
    e. Record the date of the application

*Mepilex Transfer Ag can be used in the treatment of partial thickness burns. It is a soft and highly conformable anti-microbial foam dressing that absorbs exudates and maintains a moist wound environment. Mepilex Transfer Ag inactivates wound related pathogens within 30 minutes with sustained effects up to 7 days.

See https://michiganburn.org **for just-in-time training on how to dress a burn using Mepilex Transfer Ag.**

F. Ongoing Resuscitation (as needed):

1. Monitor urine output
    a. Adjust fluids to keep urine output between the following:
        i. Adults: 30-50 ml/hour
        ii. Pediatrics: 1- 2 ml/kg/hour
2. Additional fluid needs can occur with:
    a. Very deep burns
    b. Inhalation injury
    c. Associated injuries
    d. Electrical injury
    e. Delayed resuscitation
    f. Prior dehydration
    g. Alcohol or drug dependence
    h. Small children
3. Children, the elderly and patients with preexisting cardiac disease are particularly sensitive to fluid management
4. If Myoglobin in the urine (burgundy color):
    a. Maintain urine output of 100 ml/hour for adults and 4 mL/kg/hour for pediatrics
    b. Place a foley
    c. Increase fluid rate (Lactated Ringers) to achieve urine output as targeted in (a)
    d. Diuretics are not indicated with myoglobinuria
    e. Mannitol may be used as a last resort to maintain urine output.
    f. Intravenous sodium bicarbonate may be administered to maintain an alkaline urine (pH > 6)
5. For circumferential burns to extremities:
    a. Perform pulse checks every one-hour to determine need for emergent escharotomy.
    b. Monitor by palpation or Doppler exam for:
        i. Decreased sensation
        ii. Severe deep tissue pain
        iii. Diminished distal pulses
        iv. Slowed capillary refill
        v. After 24-48 hours, decrease frequency of pulse checks to every 2 hours if stable
        vi. Elevate extremities above the level of the heart

G. **Nutrition:**

1. Obtain dry weight on admission
2. Dietary consultation, as needed
3. Regular high calorie, high protein diet if able to take PO
4. If intubated, begin tube feeding at full strength increasing to goal rate.
    a. Soft feeding tubes are preferred over hard nasogastric tubes

b. Ensure stool softeners are ordered to prevent constipation due to pain medications

H. **Mobility:**
1. Physical Therapy/Occupational Therapy consult, as needed.
    a. In a disaster, therapists may just splint patients into functional positions as needed
2. HOB elevated at all times, as allowed by spinal clearance
3. Ear burns:
    a. No external pressure should be applied
    b. No pillows or blankets under the head
4. Neck burns:
    a. Maintain the head in a neutral position
    b. No pillows or blankets under the head flexing the neck forward
5. Axilla burns:
    a. Keep arms extended to decrease contractures
    b. Elevate burned extremities above the level of the heart to decrease swelling
6. If legs are burned, apply ace wraps when OOB (Out of Bed)
    a. Encourage active range of motion hourly, when awake
    b. Wrapping should be distal to proximal
7. Encourage activities of daily living
    a. Patients should have enough pain control to perform these activities.
8. Early mobility is encouraged as patient is able

I. **Infection Prevention and Control:**
1. Utilize universal precautions
2. If wounds are exposed:
    a. Apply gown, mask, surgical hat and gloves to protect patient
3. No prophylactic systemic antibiotics are required for the burn injuries

J. **Psychosocial:**
1. Explain any procedures
2. Involve patient and family
3. Consider Social Worker consultation
4. Offer Spiritual Care

Appendix J

BMCI: ADULT FLUID RESUSCITATION

I. Burn Resuscitation Protocol www.michiganburn.org

A. Document patient's TBSA burn using Rule of Nines and Lund and Browder diagram. Include only partial and full-thickness burns.
B. Obtain weight or close estimate.

II. First 24 Hours Post Burn

A. TBSA < 20%:
   Maintenance inter-venous fluids (IVF) only until taking adequate oral intake.
B. TBSA > 20% and Weight > 30kg:
   1. Calculate estimated fluid needs:
      a. 2 cc of LR X kg of body weight X %TBSA burned:
         i. administer half of calculated amount over the first 8 hours post burn
         ii. administer half of calculated amount over next 16 hours
      b. If urine output < ½ cc/kg/hour (goal is 30-50 cc/hour):
         i. increase LR infusion by 1/3 of the hourly calculated fluid requirement
      c. If urine output > 70 cc/hour:
         i. dip urine to exclude glucosuria
         ii. decrease LR infusion by 1/3 of the hourly calculated fluid requirement
C. TBSA > 20% and Weight < 30kg (Pediatric patients- Also see Pediatric Annex))
   2. Calculate estimated fluid needs:
      a. 3 cc of LR** X kg of body weight X % TBSA burned
         i. administer half of calculated amount over the first 8 hours post burn
         ii. administer half of calculated amount over next 16 hours
      b. In addition to burn fluid requirements, also infuse maintenance IVF (calculated total for 24 hours):
         i. 100 cc X first 10 kg of body weight
         ii. 50 cc X next 10 kg of body weight
         iii. 20 cc X next 10 kg of body weight
      c. If urine output < 1 cc/kg/hour:
         i. increase LR infusion by 1/3 of the hourly calculated fluid requirement
      d. If urine output >> 1 cc/kg/hour:
         i. decrease LR infusion y 1/3 of the hourly calculated fluid requirement
      **use D5LR if patient < 1 year old

D. Place enteral feeding tube as soon as possible for all burns > 20% TBSA.

E. Consider cardiac output monitoring device placement for intubated patients with TBSA > 30%, age > 50 years and/or inhalational injury.

III. Treatment of Low Urine Output

A. In adult patients with continued low urine output despite increased fluid rates:
    3. Place cardiac output monitoring device for monitoring
        a. If central pressures normal to high with low urine output:
            i. start low dose Dobutamine @ 5 mcg/kg/min
            ii. titrate to effect
        b. If central pressures are low with low urine output:
            i. continue fluid resuscitation at increased rate

IV. After 24 Hours Post Burn

Serum Na+ and K+ should be checked at least BID on the second burn day.

A. Adjust type of fluid by the serum Na+ level.
B. After 24 hours of crystalloid, if fluid requirements are high, consider 5% albumin infusion (discuss with Attending physician).
C. Goal is to decrease IVF rate to one half of rate infused over the previous 16 hours.
    1. If patient >30 kg, urine output goal of ½ cc/kg/hour (maximum 50 cc/hour)
    2. If patient <30 kg, urine output goal of 1 cc/kg/hour

Appendix K:

Triage Decision Table

Michigan BURN MASS CASUALTY

Predicted Survivability to Inform Triage [11]

AGE	***% Total Body Surface Area Burn + 10% for Inhalation Injury***									
	0 – 10%	**11 – 20%**	**21 – 30%**	**31 – 40%**	**41 – 50%**	**51 – 60%**	**61 – 70%**	**71 – 80%**	**81 – 90%**	**91% +**
<2	**Higher**	**Higher**	**Higher**	**High**	**Medium**	**Medium**	**Medium**	**Low**	**Low**	**Lower**
2 - 5	***Outpatient***	**Higher**	**Higher**	**High**	**High**	**High**	**Medium**	**Medium**	**Low**	**Low**
5 -19.9	***Outpatient***	**Higher**	**Higher**	**High**	**High**	**High**	**Medium**	**Medium**	**Low**	**Low**
20 - 29.9	***Outpatient***	**Higher**	**Higher**	**High**	**High**	**Medium**	**Medium**	**Low**	**Low**	**Lower**
30 - 39.9	***Outpatient***	**Higher**	**Higher**	**High**	**Medium**	**Medium**	**Medium**	**Low**	**Lower**	**Lower**
40 - 49.9	***Outpatient***	**Higher**	**Higher**	**Medium**	**Medium**	**Medium**	**Low**	**Lower**	**Lower**	**Expectant**
50 - 59.9	***Outpatient***	**Higher**	**Higher**	**Medium**	**Medium**	**Low**	**Lower**	**Lower**	**Expectant**	**Expectant**
60 - 69.9	**Higher**	**Higher**	**Medium**	**Medium**	**Low**	**Lower**	**Lower**	**Expectant**	**Expectant**	**Expectant**
70+	**Higher**	**Medium**	**Medium**	**Low**	**Lower**	**Expectant**	**Expectant**	**Expectant**	**Expectant**	**Expectant**

- **Triage colors are used to guide assessment and prioritization of patients.**
- **Significant associated trauma and/or co-existing medical conditions WILL worsen prognosis.**
- **Inhalation Injuries – consider admission for airway monitoring and respiratory support.**

Definitions:

Outpatient: Survival and good outcome expected without requiring initial admission.

Higher: Survival with good outcome highly expected.

High: Survival and good outcome expected with limited/short term initial admission and resource allocation (LOS less than or equal to 14 days, one-two surgical procedures)

Medium: Survival and good outcome expected with aggressive care and comprehensive resource allocation, including initial admission (greater than/equal to 14 days), resuscitation and multiple surgeries.

Low: Survival and good outcome low even with long-term, aggressive treatment and resource allocation.

Lower: Survival and outcome poor even with unlimited resources.

Expectant: Survival of less than 10% even with unlimited, aggressive treatment

[11] ABA Chart 2011 modified to fit Michigan MCI Burn Surge Plan 2023

Appendix L

Michigan Mass Casualty Burn Plan Resource Activation/Utilization Guidelines

Probable = Prepare for Activation
Possible = It could happen

Red = Definite
Yellow = Probable
Green = Possible
White = Unlikely

Agency / Entity	Burn Stage I (10-24 Casualties)	Burn Stage II (25-100 Casualties)	Burn Stage III (>100 Casualties)
Burn Centers			
Burn centers within incident region.	Utilization definite	Utilization definite	Utilization definite
Burn centers in neighboring MI regions	Utilization probable	Utilization definite	Utilization definite
Burn centers in distant MI regions	Utilization possible	Utilization probable	Utilization definite
Burn centers in neighboring states within 150 Miles	Utilization unlikely	Utilization probable	Utilization definite
Burn centers in neighboring states beyond 150 Miles	Utilization unlikely	Utilization possible	Utilization probable
Burn centers in non-FEMA V states	Utilization unlikely	Utilization unlikely	Utilization possible

Agency / Entity	Burn Stage I (10-24 Casualties)	Burn Stage II (25-100 Casualties)	Burn Stage III (>100 Casualties)
Burn Surge Facilities (BSF)			
BSF in neighboring MI regions	Brief utilization possible	Utilization probable	Utilization definite
BSF in distant MI regions	Utilization unlikely	Utilization unlikely	Utilization possible
BSF (or equivalent) in neighboring states within 150 Miles	Brief utilization possible	Utilization probable	Utilization probable
BSF (or equivalent) in neighboring states beyond 150 Miles	Utilization unlikely	Utilization unlikely	Utilization possible
BSF (or equivalent) in non-FEMA 5 states	Utilization unlikely	Utilization unlikely	Utilization unlikely
Community Hospitals			
Hospitals within 25 Miles	Utilization definite	Utilization definite	Utilization definite
Hospitals within 25-50 Miles	Utilization probable	Utilization probable	Utilization probable
Hospitals beyond 50 Miles	Utilization unlikely	Utilization unlikely	Utilization unlikely

Agency / Entity	Burn Stage I (10-24 Casualties)	Burn Stage II (25-100 Casualties)	Burn Stage III (>100 Casualties)
Multi-Agency Coordination Entities			
MI State Burn Coordination Center	Activation probable	Activation definite	Activation definite
SEOC	Activation possible	Activation definite	Activation definite
CHECC	Activation probable	Activation definite	Activation definite
Regional MCC serving incident	Activation definite	Activation definite	Activation definite
Neighboring MCC	Activation probable	Activation definite	Activation definite
Distant MCC	Activation possible	Activation possible	Activation probable
Local EOC serving incident	Activation definite	Activation definite	Activation definite
EOC in neighboring counties	Activation possible	Activation probable	Activation definite
EOC in distant counties	Activation unlikely	Activation possible	Activation possible

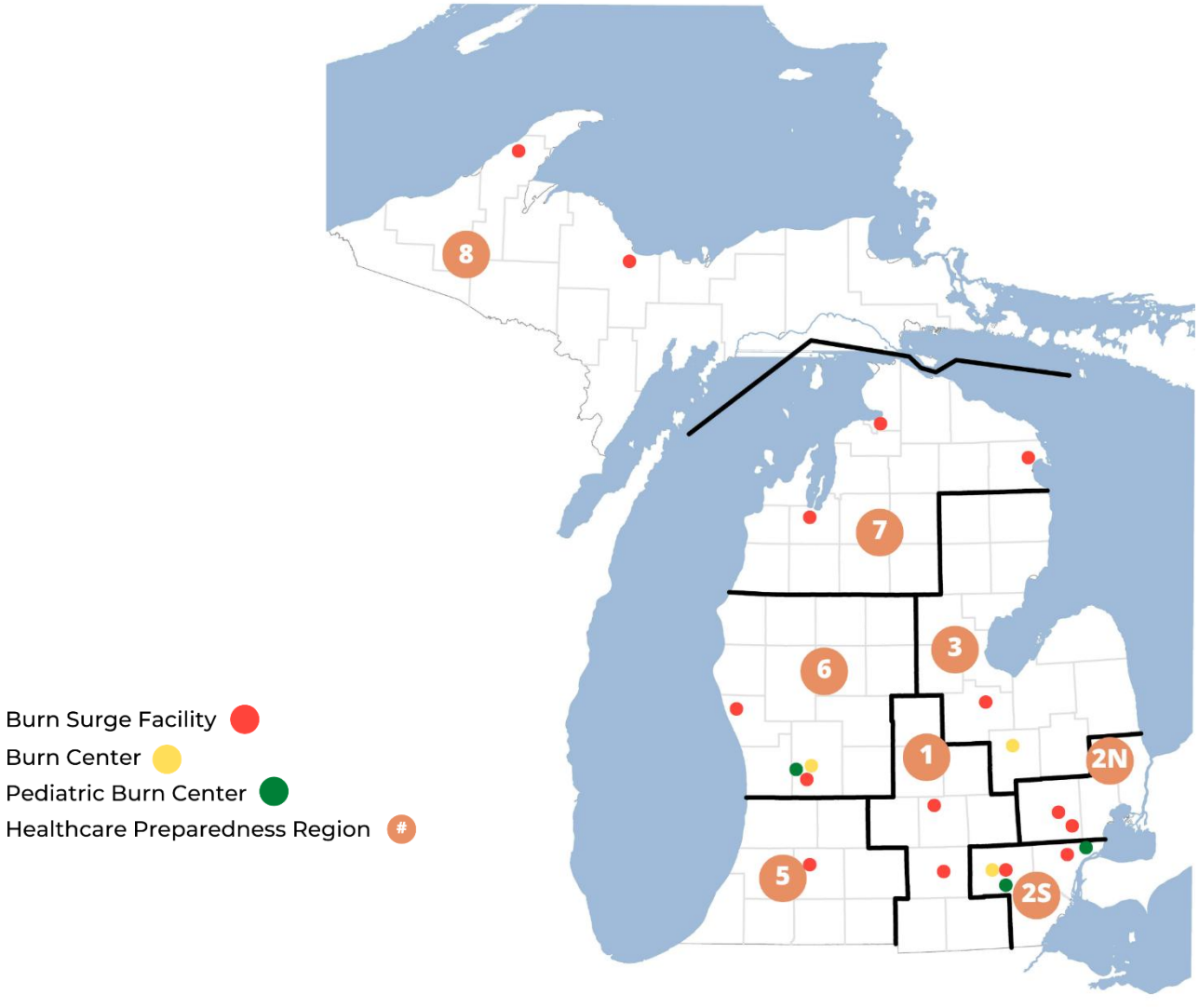
Appendix M
Michigan Burn Surge Facilities

Region	Facility Name	Contact
Region 1	**University of Michigan Health – Sparrow** 1215 E. Michigan Avenue, Lansing, MI 48909 **Henry Ford Jackson Hospital** 205 N. East Avenue, Jackson, MI 49201	517-364-1000 517-788-4800
Region 2N	**McLaren Oakland** 50 N. Perry Street, Pontiac, MI 48342 **Corewell Health William Beaumont University Hospital – Royal Oak** 3601 W. 13 Mile Road, Royal Oak, MI 48073	248-338-5000 248-898-5000
Region 2S	**Henry Ford Hospital** 2799 W. Grand Blvd #109, Detroit, MI 48202 **Trinity Health Ann Arbor Hospital** 5301 E. Huron River Drive PO Box 992, Ann Arbor, MI 48106	313-916-2600 734-712-3456
Region 3	**MyMichigan Medical Center Saginaw** 800 S Washington Ave, Saginaw, MI 48601	989-907-8000
Region 5	**Bronson Methodist Hospital** 601 St. John Street, Kalamazoo, MI 49007	269-341-6022
Region 6	**Trinity Health St. Mary's Grand Rapids** 200 Jefferson Street S.E.Grand Rapids, MI 49503 **Trinity Health Muskegon Hospital** 1500 E Sherman Blvd, Muskegon, MI	616-685-5000 231-672-3916
Region 7	**Munson Medical Center** 1105 Sixth Street, Traverse City, MI 49684 **McLaren Northern Michigan** 416 Connable Avenue, Petoskey, MI 49770 **MyMichigan Medical Center – Alpena** 1501 W. Chisholm Street, Alpena, MI 49707	231-935-5000 800-248-6777 800-556-8842
Region 8	**UP Health System - Marquette** 850 W. Baraga Ave, Marquette, MI 49855 **UP Health System – Portage** 500 Campus Drive, Hancock, MI 49930	906-228-9440 906-483-1000

Appendix N

Michigan Burn Centers

Facility Name	City	Region	Normal Capacity	Surge Capacity
University of Michigan Medical Center	Ann Arbor	2S	Adult/Pediatric 16 beds	35 Flex
Children's Hospital of Michigan	Detroit	2S	Pediatric 10 beds (2 ICU, 8 Floor)	3 ICU, 12 Floor
Detroit Receiving Hospital	Detroit	2S	Adult 12 beds	12 ICU, 18 Floor
Hurley Medical Center	Flint	3	Adult 14, Pediatric 10	15 Flex
Corewell Health Regional Burn Center	Grand Rapids	6	Adult: 8 Acute, 4 ICU Peds: 6 Acute, 2 PICU	Adult: 12 Acute, 8 ICU Peds: 12 Acute, 6 PICU



Appendix O

American College of Surgeons Verified Michigan Trauma Centers

Last updated: April 2026

REGION	VERIFIED INSTITUTION	CITY	LEVEL
1	Henry Ford Jackson Hospital	Jackson	III
1	The University of Michigan-Sparrow Hospital	Lansing	I
1	McLaren Greater Lansing	Lansing	III
2N	DMC Huron Valley-Sinai Hospital	Commerce	III
2N	Henry Ford Macomb Hospital	Clinton Township	II
2N	Henry Ford Rochester Hospital	Rochester	III
2N	Henry Ford Warren Hospital	Warren	III
2N	Henry Ford West Bloomfield	West Bloomfield	III
2N	Lake Huron Medical Center	Port Huron	III
2N	McLaren Port Huron	Port Huron	III
2N	McLaren Macomb Hospital	Mt Clemens	II
2N	McLaren Oakland Hospital	Pontiac	II
2N	Trinity Health Oakland Hospital	Pontiac	II
2N	Corewell Health Macomb Hospital	Farmington Hills	II
2N	Corewell Health Wm. Beaumont University Hospital	Royal Oak	I, II (Ped)
2N	Corewell Health Troy	Troy	II
2N	Ascension Providence Hospital	Southfield	II
2S	C. S. Mott Children's Hospital	Ann Arbor	I (Ped)
2S	Trinity Health Ann Arbor Hospital	Ann Arbor	I
2S	University of Michigan Health System	Ann Arbor	I
2S	Children's Hospital of Michigan	Detroit	I (Ped)
2S	Detroit Receiving Hospital	Detroit	I
2S	Henry Ford Hospital	Detroit	I
2S	Henry Ford Wyandotte Hospital	Wyandotte	III
2S	DMC Sinai-Grace Hospital	Detroit	II
2S	Ascension St. John Hospital	Detroit	II (Adult), II (Ped)
2S	Corewell Health Dearborn Hospital	Dearborn	II
2S	Corewell Health Trenton Hospital	Trenton	II
2S	Corewell Health Beaumont Grosse Pointe Hospital	Grosse Pointe	III
2S	Garden City Hospital	Garden City	III

3	Hurley Medical Center	Flint	I, II (Ped)
3	Henry Ford Genesys Hospital	Grand Blanc	III
3	McLaren Lapeer Region	Lapeer	II
3	McLaren Flint	Flint	III
3	McLaren Bay Region	Bay City	III
3	MyMichigan Medical Center Midland	Midland	II
3	Covenant Healthcare	Saginaw	II, II (Ped)
3	Ascension St. Mary's Hospital	Saginaw	II
5	Ascension Borgess Hospital	Kalamazoo	II
5	Bronson Methodist Hospital	Kalamazoo	I
5	Corewell Health Lakeland St. Joseph Hospital	St. Joseph	III
5	Oaklawn Hospital	Marshall	III
6	Trinity Health Grand Rapids Hospital	Grand Rapids	II
6	Corewell Health Butterworth Hospital	Grand Rapids	I
6	Corewell Health – Helen DeVos Children's	Grand Rapids	I (Ped)
6	Corewell Health Blodgett Hospital	Grand Rapids	III
6	Corewell Health Zeeland Hospital	Zeeland	III
6	Holland Hospital	Holland	III
6	Trinity Health Muskegon Hospital	Muskegon	II
7	Munson Medical Center	Traverse City	II
7	McLaren Northern Michigan	Petoskey	II
7	MyMichigan Medical Center Alpena	Alpena	III
8	UP Health System – Marquette	Marquette	II
8	UP Health System – Portage	Hancock	III

Appendix P

Initial Casualty Report Form

NAME:		
AGE:	**GENDER:** Male Female	
DATE and TIME OF INJURY:		
INJURY MECHANISM:		
INHALATION INJURY EXPOSURE:		
• Enclosed Space	Yes	No
• Toxic Chemical Exposure	Yes	No
• Facial Burns	Yes	No
• Intubation /Mechanical Ventilation	Yes	No
Total Body Surface Area Burned:		
• Partial Thickness %		
• Full Thickness %		
Body regions burned:		
• Circumferential torso burn	Yes	No
• Circumferential extremity burn	Yes	No
• Decreased peripheral perfusion	Yes	No
Concurrent Trauma	Yes	No
Injuries:		
Co-Morbidities/Past Medical History:		
Wound Management (Dressings):		
Institutional Location (BSF, ICU/Floor):		
Contact Information:		

Appendix Q

Follow-up Casualty Report Form

NAME:			
AGE:	**GENDER:** Male Female		
DATE and TIME OF INJURY:			
DATE and TIME OF CURRENT REPORT:			
INJURY MECHANISM:			
Total Body Surface Area Burned:			
• Partial Thickness %			
• Full Thickness %			
• Circumferential torso burn	Yes	No	
• Circumferential extremity burn	Yes	No	
• Decreased peripheral perfusion	Yes	No	
Date and Time of most recent wound evaluation:			
Current burn wound dressing/management			
Date and Time of last burn dressing change:			
Procedures performed? (Escharotomies, other emergent procedures)?			
RESUSCITATION RESPONSE:			
Total fluid volume received since initial injury:			
Total fluids over last 24 hours:			
Current fluid administration rate:			
Urine output over last 24 hours?		**Last 4 hours?**	
Current V/S: HR_____B/P_____ RR _____Temp C_____			
PULMONARY STATUS			
Current SaO2:	**Current FiO2:**		
Intubated:	Yes	No	
Ventilator Settings:			
COMPLICATIONS:			
Number of Casualties at your Location?			
Priority for transfer among your current Burn casualties?			
Institutional Location (BSF, ICU/Floor):			
Contact Information:			

Appendix R

Burn Surge Facility Casualty Census Form

Fax this from to the SBCC Fax # 734-232-4892

(Please complete this form in addition to report form for each individual casualty)

Date: _____

Time: _____

Date of Mass Casualty Incident: _____

Facility: _____

Contact Information: _____

	Name	Age	TBSA	Intubated (Y/N)	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Continued on/from additional form?Y / N **Page: _____ of _____**

Appendix S

Information That Needs to Transfer with a Burn Patient

A. Information/face sheet with patient name/identifier
B. Emergency Medical Treatment and Active Labor Act (EMTALA) paperwork (if applicable)
C. Hospital documentation (copies of physician, nursing, ancillary staff)
D. SBCC Report Form (copy)
    1. Initial casualty report form
    2. Follow-up casualty report form
E. CD with radiologic imaging completed
F. MI-Burn EMS Inter-facility Transfer Form

Appendix T:
EMS Transport Sheet

Sending Facility Name:				Phone #:		
Destination Facility Name:				Phone #:		
Patient Name/Identifier:				DOB:	M	F
Date:	Pick up time:			Drop off time:		
Calculated Fluid Needs:	Oxygen:			Medication:		
IV Fluids: 0.9%NS LR Other (Specify):						
Flow Rate ml/hr:	Location of IVs:					

Time	P	RR	B/P	SpO2	Medication/Procedure/Notes	Amt/Size

Vent Settings:	Airway Size: cm	Secured @

Time	Mode	Volume	Rate	PEEP	FiO2	ETCO2	Average Peak Pressure
Pickup:							
Destination:							

Total Intake	Total Output

Notes:

EMS Transporting Unit:	Paramedic Name:
Paramedic Signature:	Paramedic Cell Phone #:
Receiving RN/MD/DO/NP/PA Signature:	

QUICK TIPS:

- **Completion of Worksheet – Refer to back of form**
- **Keep patient warm**

- **Transport needs of fluids/medications/Oxygen**
- **Monitor urine output. Patient has a foley?**
- **Hourly updates given to receiving hospital**

Worksheet for Transport

Calculate Transport Time to Destination: consider road conditions, obstacles, weather.	
Calculate Amount of Fluid needed	
Calculate Oxygen needed	
Medications needed:	
Narcotics	
Sedation	
Paralytics	

Open Critical Care Cylinder Duration Calculator

Michigan Burn Centers		
University of Michigan Health Systems (*State Burn Coordinating Center)*	Adult & Pediatric	734-936-9631
Children's Hospital of Michigan	Pediatric	313-745-5678
Detroit Receiving Hospital	Adult	313-745-3078
Hurley Medical Center	Adult & Pediatric	810-262-9188
Bronson Methodist Hospital	Adult	269-341-6022
Corewell Health West	Adult & Pediatric	616-391-9025

Appendix U

Great Lakes Healthcare Partnership

The Great Lakes Healthcare Partnership (GLHP) represents a coalition of healthcare preparedness planners from the HHS Region V jurisdictions of: The City of Chicago, Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin, who are responsible for the Hospital Preparedness Program under the Administration for Strategic Preparedness and Response (ASPR) within the federal Department of Human Services (DHHS). This group works together to develop a series of initiatives aimed at promoting multi-state and HHS V cooperation in planning for disasters requiring a healthcare response.

This BMCI Plan represents an acknowledgement by the GLHP membership, that a response to a major MCI situation, especially one involving the need for the provision of highly specialized burn related care, redefines the concept of local preparedness in a disaster environment. While there is little argument against the conceptual case for all disasters being "local", the context of what "local" really means in today's environment is being challenged and redefined.

In more general terms, disaster responses occur when the available resources of a locality are, or have the potential to be, overwhelmed. Specialized medical care such as burn care involves a finite capacity for delivery. Therefore, the availability and provisions for delivering that care can easily be jeopardized due to limited resources.

The GLHP gives the opportunity to draw from out-state resources when in-state resources have been exhausted.

HSS Region V

Appendix V

Great Lakes Healthcare Partnership Resources

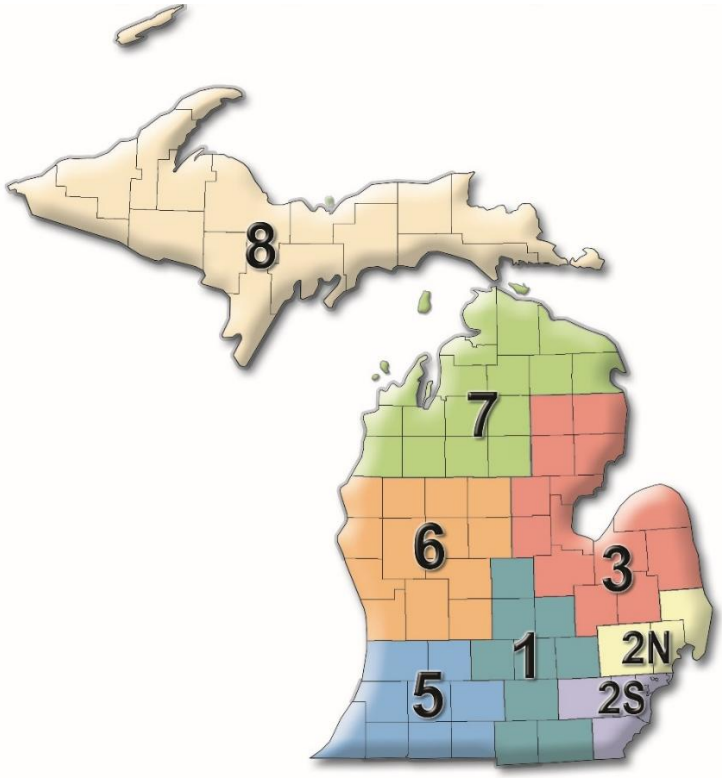
Last updated: April 2026

IL	Loyola University Medical Center Adult/Pediatrics	Maywood	10 ICU 11 Step Down
Chicago IL	Sumner L. Koch Burn Center Adult/Pediatrics	Chicago	6 ICU 12 Step Down
Chicago IL	University of Chicago Burn Center Adult/Pediatrics	Chicago	16 Beds
IL	Regional Burn Center Memorial Medical Center Adult	Springfield	10 Beds
IN	St. Joseph Medical Center Regional Burn Center	Fort Wayne	12 Beds
IN	Indiana University Medical Center Burn Center Eskenazi Memorial Hospital Adult	Indianapolis	15 Beds
IN	Riley Children's Hospital	Indianapolis	8 Beds
MN	Hennepin Healthcare Burn Center Adult/Pediatrics	Minneapolis	17 Beds
MN	Regions Hospital Burn Center Adult/Pediatrics	St. Paul	18 Beds
MN	Essentia Health – Duluth Burn Center	Duluth	15 Beds
OH	Premier Health (Miami Valley Hospital) Regional Adult Burn Unit	Dayton	10 Beds
OH	Ohio State University Hospital Adult Burn Center	Columbus	18 Beds
OH	Nationwide Children's Hospital	Columbus	14 Beds
OH	Children's Hospital Medical Center of Akron Pediatric/Adult	Akron	12 Beds
OH	The University of Cincinnati Medical Center Burn Center	Cincinnati	9 Beds
OH	Shriners Hospital for Children	Cincinnati	14 Beds
OH	MetroHealth Medical Center Adult/Pediatrics	Cleveland	14 Beds

OH	MercyHealth St. Vincent's Hospital Burn Center	Toledo	10 Beds
WI	UWHealth (University of Wisconsin Hospitals and Clinics) Adult/Pediatrics	Madison	12-16 Beds
WI	Ascension Columbia St. Mary's Hospital Regional Burn Center	Milwaukee	12 Beds

Appendix W

Michigan Regional Healthcare Coalition Medical Coordination Centers



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Region 8	Ed Unger	Ed.unger@region8.org	(906)-273-2125

Appendix X

Burn Surge Facility Training

It is essential to the success of this plan that nurses and physicians staffing BSFs are trained in basic burn care. At a minimum, it is expected that each BSF will have at least 15 nurses and five physicians on staff that have successfully completed the ABLS Now Online Course. This course covers essential fundamentals of emergency burn care and is felt to be an efficient and effective educational program.

BSFs should send, when available, the above noted personnel to an initial one-day support Burn Surge Facility Training. The cost for the actual training will be covered by federal preparedness funds through the State Burn Coordinating Center. The cost of travel, meals, and overnight accommodation, where appropriate will be covered at the discretion of the Regional Healthcare Coalition in which the Hospital resides based on funding availability.

Other opportunities for training could include rotating BSF nurses through regional burn centers to gather actual clinical experience in dealing with severe burns. These activities can be coordinated by the respective regional HCC.

Appendix Y

Roles, Responsibilities and Expectations of BSFs

Identification of the Burn Surge Facilities (BSFs) allows for the development and education of staff with a Healthcare Organization (HCO) that may not typically treat burn patients beyond initial stabilization and transport, enabling the HCO to provide care for the initial 24-72 hours post incident.

Roles and Responsibilities:

A. Regional BSFs should be responsible for the initial evaluation and stabilization of burn patients and preparation for transfer, if necessary, during the initial 72 hours.
B. Regional BSFs should have 24-hour coverage with ABLS-trained nurses and physicians or Advanced Care Practitioners.
C. Patients treated and discharged by Regional BSFs should be referred to a Burn Center for complications and any needed long-term follow-up.

Expectations:

A. BSFs are preferably Level I or II trauma centers. Telemedicine capability is desirable.
B. At a minimum BSFs should meet the general requirements of a Level III trauma center.
C. BSFs must have 24-hour nursing care for burn patients. Sufficient numbers of nurses and physicians should be ABLS-trained such that an ABLS-trained nurse or physician should (at a minimum) be able to lead the care provided to patients.
D. Each BSF should have sufficient numbers of ABLS-trained physicians to be available in-house during a burn MCI. A minimum of 15 nurses and 5 physicians or Advanced Care Practitioners should be maintained.
E. BSFs will function as the initial triage/stabilization/resuscitation/transport staging center with support of the region's Medical Coordination Center (MCC) and the CHECC if a BMCI occurs.
F. Initial stabilization:
    1. Assessment of airway, breathing, and circulation
    2. Fluid resuscitation by burn protocols
    3. Pain management
    4. Wound care
G. It is expected that the BSFs will need to care for some burn patients during the initial 3 days while burn centers triage care for all burn casualties.
H. Critically burned pediatric patients will be the first to be transferred to a Burn Center.
I. All BSFs in the state should be prepared to receive burn casualties as triaged by the SBCC (Appendix L).
J. All BSFs will perform a burn supply cache check, each quarter and send the appropriate form to the SBCC attention Aren Kurth (arenkurt@med.umich.edu). See Appendix CC.

Appendix Z

Exercising

At least every two years, MDHHS BETP will plan to conduct a tabletop exercise incorporating a BMCI scenario. The SBCC will participate in working with BETP to fill the designated role in the exercise. Each HCC will be expected to participate and may initiate additional exercises consistent with their respective regional exercise corrective action improvement plan. It is anticipated that regional participation should include the Regional Medical Director, Regional Healthcare Coordinator, Regional Epidemiologist, Michigan State Police Emergency Management and Homeland Security Division (EMHSD) District Coordinator, and representatives from regional hospitals (especially burn centers and BSFs), EMS, and local emergency management coordinators.

Additional functional and full-scale exercises will be considered as resources permit.

Appendix AA

Supplies

To determine supply caches, assumptions were made regarding the MCI patient population. Projections were calculated based on an average sized adult, with 60% of the MCI patient population sustaining a >15% TBSA burn injury. The total number of estimated patients is 30 patients per million populations (i.e., 60% of the federal benchmark 50 patients per million populations). The supplies per patient have been determined based on the number injured **as well as the hospitals already having a surplus on hand.**

Silver based long-acting dressing: 24 8 x 20-inch sheets per BSF
Silver sulfadiazine (Silvadene) Dressing – 12 jars per BSF

Recommendations regarding the purchase and stockpiling of burn supplies for the treatment of burn patients in the mass casualty environment are predicated on:

- There will be limited availability of essential supplies and bed space in burn centers.
- There will be constraints on human resources.
- The need for short-term care to be managed by medical staff who are not traditionally trained in specialized burn wound care.
- Adjusted standards of care will be provided during surge and crisis situations.

As a consequence, a conscious decision is being made to utilize supplies that will simplify patient care provided in a mass casualty environment, thus minimizing the staff training needed to care for burn injuries. This is especially critical in an environment where staff resources will already be stretched beyond capacity.

Supply Staging

Based on this model, using a silver-based long-acting dressing and silver sulfadiazine cream, MDHHS BETP will maintain a stock of 336 sheets (8 x 20 inch) of silver-based long-acting dressing and 192 jars of silver sulfadiazine (Silvadene) cream. To maintain a balance between ensuring supplies are readily available during a mass casualty incident (MCI) and allowing for stock rotation to minimize product expiration, the equivalent supplies for two Burn Surge Facilities (48 sheets of dressing and 24 jars of cream) will be maintained at the SBCC to facilitate rotation.

Burn Mass Casualty Incident Kits Located at the BSFs

Inventory and Stock Check

- The supplies in the Burn Mass Casualty kits are intended only for use during a mass casualty event and not for day-to-day clinical operations.
- Mepilex Transfer Ag must be kept in the original boxes and packaging.

- A stock check is taken once per quarter and recorded on the Supply Checklist form *(Appendix CC).*
- Any anomalies in stock volume should be reported to the SBCC for resolution and replacement immediately.

Receipt and Storage of Stock Orders.

- All deliveries must be acknowledged on the Stock Checklist.
- All stock received should be placed into the Burn Mass Casualty kit and managed as defined above.
- Good housekeeping principles must be applied to stock management so that items are kept in an orderly manner.
- BSFs that need to reorder supplies during a BMCI need to use *Appendix DD.*

Product Recalls

- The BETP and SBCC must be notified immediately (if they are not already aware) of product recalls. An assessment will be made of the criticality of the recall and appropriate action taken.
- For Stock Management purposes, all recalled products are removed from all areas and disposed of or returned to the manufacturer as instructed. Document on the Stock Management Worksheet the disposition of this product as ‘recalled product.’

Appendix BB

State of Michigan Burn Mass Casualty Incident Supply Kit

Date		**Checked by**			
		Institution			
Item	Supplied by	Expiration Date	Quantity	Date Ordered	Date Received
Silvadene • 1 boxes (12 jars)	SBCC				
Mepilex Transfer Ag • 2 cases (24 sheets)	Mölnlycke				
Training CDs (1)	SBCC				
Printed Training Manual	SBCC				
Fluid cards (20)	SBCC				
Triage Charts • Laminated (1) • Non-Lam. (10)	SBCC				
MI Regions Map (1)	SBCC				
Jump Drive (1)	SBCC				
Kit Management Protocol paper	SBCC				
Mölnlycke Insert	SBCC				
Patient Management Worksheet (2)	SBCC				
Database Tutorial (1)	SBCC				
BSF Casualty Census Form (2)	SBCC				
Initial Burn Casualty Report Form (2)	SBCC				
Follow up Burn Casualty Report Form (2)	SBCC				
EMS Inter-facility Transfer Forms (15)	SBCC				

Please complete the first week of each Month and return to:

Aren Kurth at arenkurt@med.umich.edu

Appendix CC

Supply Re-order Form

Date_____

Requisitioned by:

Name: _____

Hospital or Facility: _____

Address 1: _____

Address 2: _____

City, State, Zip code: _____

Phone: _____

Email: _____

To re-order stock, please complete this sheet and return it to Aren Kurth in the SBCC via fax (734-232-4892) or email (arenkurt@med.umich.edu).

Code/Ref No.	Description	Qty. Required	SBCC USE ONLY	
			Qty. Issued	Issued By

Acronyms

Acronym	Description
ABA	American Burn Association
ABC	Airway, Breathing, Circulation
ABG	Arterial Blood Gas
ABLS	American Burn Life Support
ACS	American College of Surgeons
Ag	Silver
ASPR	Administration for Strategic Preparedness and Response
BEPESoC	Bureau of Emergency Preparedness, EMS and Systems of Care
BSF	Burn Surge Facility
CBC	Complete blood count
CHECC	Community Health Emergency Coordination Center
CO	Carbon monoxide
COHb	Carboxyhemoglobin
D5LR	Dextrose 5% in lactated ringers
DEPR	Division of Emergency Preparedness and Response
DHHS	Department of Health and Human Services
DMAT	Disaster Medical Assistance Team
EEI	Elements of Essential Information
EKG	Electrocardiogram
EM	Emergency Manager
EMHSD	Emergency Management and Homeland Security Division
EMS	Emergency Medical Services
EMTALA	Emergency Medical Treatment and Active Labor Act
EOC	Emergency Operations Center
ESF #8	Emergency Support Function #8: Public Health and Medical Services Annex
ETT	Endo-tracheal tube
FEMA	Federal Emergency Management Agency
FiO2	Fractured Inspired Oxygen
GLHP	Great Lakes Healthcare Partnership
HCC	Healthcare Coalition
HCO	Healthcare Organization
HHS	Health and Human Services
HPP	Hospital Preparedness Program
ICS	Incident Command System
ICU	Intensive Care Unit
IV	Intravenous
Kg	Kilogram
lpm	Liters per minute
LR	Lactated ringers
LZ	Landing Zone

Acronym	Description
MACS	Multi-Agency Coordination System
MCA	Medical Control Authority
MCC	Medical Coordination Center
MCI	Mass Casualty Incident
MDHHS	Michigan Department of Health and Human Services
MIHAN	Michigan Health Alert Network
mL	Milliliter
MPSCS	Michigan Public Safety Communication System
MOU	Memorandum of Understanding
MSCC	Medical Surge Capacity and Capability
MSP	Michigan State Police
NDMS	National Disaster Medical System
NIMS	National Incident Management System
NPO	Nothing by mouth
O2	Oxygen
PAHPA	Pandemic and All-Hazards Preparedness Act
PAHPAIA	Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019
PAHPRA	Pandemic and All-Hazards Preparedness Reauthorization Act of 2013
PHS	Public Health Service
PL	Plain language
PO	By mouth
SBCC	State Burn Coordinating Center
SEOC	State Emergency Operating Center
TBSA	Total Body Surface Area

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