



Northeast Wisconsin Healthcare Emergency Readiness Coalition – Region 3 Burn Surge Plan



Northeast Wisconsin Healthcare Emergency Readiness Coalition Region 3

Annex 4 Burn Surge Plan

June 2022



Northeast Wisconsin Healthcare Emergency Readiness Coalition – Region 3
Burn Surge Plan

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Definitions

1. Local Hospital is defined as the hospital (with any level trauma center) closest to the incident. This hospital will receive patients directly from the incident scene and will stabilize prior to transfer to a Burn Surge Facility or Burn Center.
2. Primary Receiving Burn Centers are UW Health in Madison and Ascension Columbia St. Mary's in Milwaukee. These facilities support and coordinate the triage and transfer of patients at the incident scene and local hospital. The facility that handles the incident is determined either by on scene EMS or the Local Hospital based upon their transfer preferences. The State BMCI Plan is activated by the Primary Receiving Burn Center if they are unable to receive all burn patients from the scene/local hospital.
3. Burn Centers are final transfer locations of burn patients and include. The State BMCI plan outlines all regional burn centers, including those listed below:
 - a. University of Wisconsin Hospital, Madison, WI
 - b. Columbia/St. Mary's Hospital, Milwaukee, WI
 - c. Children's Hospital of Wisconsin, Milwaukee, WI
 - d. Hennepin County Medical Center, Minneapolis, MN
 - e. Mayo Clinic, Rochester, MN
 - f. Regions Hospital, St. Paul, MN
 - g. Loyola University Medical Center, Chicago, IL
 - h. University of Chicago Burn Center, Chicago, IL
 - i. University of Iowa, Iowa City, IA
 - j. University of Michigan Health System, Ann Arbor, MI
4. Burn Incident is any incident that involves:
 - Burn victims with severity of burns that cannot be managed by local hospital resources and/or
 - The number of burn victims is such that this number of burn victims cannot be managed by transfer to the Burn Center(s).

Note: EMS should be familiar with local hospital resources and should be able to identify a burn incident, based on its knowledge of local hospital resources to manage a Burn Incident.
5. Burn Surge Facilities is the name for a group of hospitals identified by the State Burn MCI Plan as the hospitals initially contacted by the Primary Receiving Burn Center to care for burn patients until they can be transferred to a Burn Center.



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Introduction

Purpose

The Northeast Wisconsin Hospital Emergency Readiness Coalition provides these guidelines to the region for the response to a burn mass casualty incident. This annex includes resources for first responders, local hospitals, and burn surge facilities. This annex has been developed to support healthcare agencies and facilities and increase the burn capabilities of the region and the state. Actions described here are intended to support, not replace, any existing facility or agency policy, standard work, or plan.

Scope

This annex provides support and guidance to supplement the HERC regional emergency response plans. Specifically, it is designed to address communications and resources available to regional partners during the activation of the state burn MCI plan. This annex also works to address relevant capabilities listed in the Hospital Preparedness Program (HPP) and Public Health and Emergency Preparedness (PHEP) grants, of which are listed in the state plan.

Background

The unique needs of burn patients and limited burn resources mandate specialized and appropriate planning for response to a burn mass casualty incident (BMCI). A BMCI is defined by the American Burn Association (ABA) as any catastrophic event in which the number of burn victims exceeds the capacity of the local burn center to provide optimal burn care. There are local risks across every region that could contribute to a burn-specific mass casualty event; including, but not limited to: pipelines, industrial zones, terrorist events, transportation accidents, rail accidents, factory accidents, and laboratory accidents.

The ability for a hospital facility to care for a burn patient depends on the capacity and capability which includes the availability of burn beds, burn surgeons, burn nurses, other support staff, operating rooms, equipment, supplies, and related sources. The activation of the state burn MCI plan depends on the capacity and capability of the primary receiving burn center (UW Health as the State Burn Coordinating Center or Ascension Columbia St. Mary's as the Lead Burn Surge Facility) at the time of the incident.

Planning Assumptions

The assumptions granted for this annex are as follows:

- In the State of Wisconsin, a BMCI is an incident that overwhelms the primary receiving burn center. The ability for the primary receiving burn center to take burn patients depends on the capacity and capability of the facility at the time of the incident.
- UW Health and Ascension Columbia St. Mary's, as the primary receiving burn centers, will serve as primary receiving facilities for their respective areas and will assist in the triage and coordination of patient transport as needed.
- Response to a burn event will begin on a local EMS and will expand out as necessary with the help of the primary receiving burn center. Hospitals at Level III and IV should be



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capable of stabilizing burn patients until the primary receiving burn center can determine transfer needs. However, one or two patients with severe burns may overwhelm the resources of these hospitals.

- Burn victims, as other patients, prefer to be treated locally. Local EMS and hospitals will communicate with their preferred primary receiving burn center (based on their normal transfer procedures) to coordinate patient transfer.
- UW Health and Columbia St. Mary's will determine the need to initiate the activation of Wisconsin's BMCI Plan. The activation of the BMCI Plan may happen without warning and could require the immediate re-allocation of hospital resources in the area where the initial event has occurred.
- In a BMCI, local partners within the state may activate their hospital plans and/or coalition plans to support patient treatment, transfer, and tracking. This includes this Regional Annex.
- Hospitals at Trauma Level I and II have the resources to stabilize and treat burn patients and will serve—on a voluntary basis—as Burn Surge Facilities. During a large-scale BMCI, BSFs throughout the State of Wisconsin may be called upon to provide burn care for up to 5 critical burn patients for 48-72 hours or less until the patient(s) can be transferred to a verified burn center.
- Federal resources from the Strategic National Stockpile or its Managed Inventory assets to support the primary receiving burn center and other hospitals will take at least 12 hours to arrive, once the Governor has made this request and the request has been approved by the federal government.
- National burn bed capacity is limited and coordination of patient transfers (destination and logistics) may take days to achieve when out-of-state capacity is required.
- Regional ABA plans will be followed and the primary receiving burn center will contact the Lead in Midwest Regional Interstate Response in the event of a BMCI that exceeds state capacity (See state plan for more contact information and links to inter-state regional plans).

Concept of Operations

Management of the Burn Incident by EMS and the Local Hospital

1. The first agency on scene (EMS, fire, law enforcement) establishes the field Incident Command Center (ICC) in response to the Burn Incident. Based on the nature of the incident and the number of victims involved, the field Incident Commander may request the activation of the local Emergency Operations Center (EOC).
 - a. If an Incident Command at the incident scene is set up, the primary receiving burn center should be called following the notification guidelines listed below and in the state BMCI plan.
2. EMS follows State of Wisconsin Trauma Field Triage Guidelines. If the State of Wisconsin Trauma Field Triage Guidelines cannot be followed because of the nature of the burn



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incident, then EMS in the field should triage the burn victims by the triage colors of RED, YELLOW, GREEN, and BLACK, according to standard triage procedures.

3. The field Incident Commander is to notify the local hospital that a burn incident has occurred and give an estimate of the number of victims involved.
4. If the local hospital decides that they can manage the incident, then no further hospitals, other than the primary receiving burn center, may need to be involved. The local hospital will activate, as necessary, its Emergency Operations Plan and Incident Command System, stabilize the burn victim(s), contact the appropriate Burn Center and then follow the instructions of the Burn Center for which patients should be transferred.
5. The local hospital will contact the primary receiving burn center following the notification guidelines listed below and in the state BMCI plan

Activation of the Regional Annex and State BMCI Plan

EMS, regional dispatch, healthcare facilities, or HERCs will notify the primary receiving burn center depending on the location of the incident when >2 critical burn patients are involved in a BMCI. Communications will occur via standard telephone, two-way radio, Wiscom or through other direct communication means. An EMResource activation should occur as well.

The regional HERC BMCI annex may be activated prior to or in reaction to the activation of the state plan. The activation of this annex is determined by the HERC Coordinator when reviewing the regional capabilities in either response to a local incident or due to the activation of a BSF for an incident in another region.

The state BMCI plan is activated when a burn incident overwhelms the capacity or capabilities of the primary receiving burn center (e.g., staff, bed availability, etc.) Each primary receiving burn center is responsible for identifying and outlining their resources and capabilities.

Activation of the State BMCI Plan

Prior to State Plan Activation

- EMS agencies, dispatch agencies, healthcare facilities and/or the HERC POC will contact UW Health Access Center or the Ascension Columbia St. Mary's Access Center depending on the location of the incident or facility.
 - **Columbia St. Mary's Access Center: 414-585-6683 or 414-272-2876**
 - **UW Health Access Center: 800-472-0111 or 608-263-3260**
- EMS will only call the Access Centers if an incident command has been set up at the scene. If an incident command is not set up on scene, all patients will be transferred to the closest appropriate facility (local hospital) following normal procedures



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- The receiving local hospital will contact the primary receiving burn center to coordination triage and transportation needs.
- EMS and hospital facilities will follow normal transport preferences and procedures when determining to call either UW Health or Columbia St. Mary's
- The UW and Columbia St. Mary's Access Centers will follow internal procedures to contact the attending on-call burn surgeon for triage and transport support (See state plan for more information).
- If the Primary Receiving Burn Center is unable to accept all burn patients, the burn surgeon will make the decision to initiate the state burn plan.

Upon the Activation of the State BMCI Plans

The notification process of the state BMCI plan starts upon the activation of the plan from the primary receiving burn center:

The notification process can be viewed in the below diagram:

- The primary receiving burn center sends an EMResource Alert to relevant partners (e.g., BSFs, OPEHC, HERC, etc.). The alert is sent to partners at the digression of the primary receiving burn center on who needs to be informed or involved in the response. For example, Children's Hospital does not need to be alerted if there are no pediatric patients.
- The BSFs and Children's Hospital respond to the EMResource Alert with the information requested by the primary receiving burn center (e.g., bed availability).
- The BSFs chosen to support the response receive information from the primary receiving burn center regarding incoming patients.
- If the incident exceeds state resources, the primary receiving burn center contacts the Midwest Burn Region to coordinate the transfer of burn patents to out-of-state facilities (See state plan for more information).

Communication Mechanisms

There are several communication methods used in the notification process of this plan:

- Phone: Communication to primary receiving burn center from EMS agency, dispatch center, hospital, or HERC.
- WISCOM radio: Communication between facilities
- Additional radio channels: EMS use on a local/regional basis
- EMResource: Alert drafted by the primary receiving burn center to alert healthcare facilities of an MCI incident. This is used to understand the real-time capacity of hospitals. Any member of EMResource has the ability to register an event and alerts can be sent to specific facilities, partners in a region, or all state partners.



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Transfer Agreements

The state burn MCI plan describes in details the transfer understanding and agreements that local EMS and hospitals will call either the primary receiving burn center when there are >2 burn patients for awareness and assistance in the triage and transport of burn patients.

Deactivation and Recovery

The deactivation of the state BMCI plan occurs when all burn patients have either been discharged from the BSF or transferred to a burn center. There may be continued information sharing and resource needs following the deactivation of the state plan.

Upon notification of the end of the incident from the primary receiving burn center, the HERC will cease its support operations in sharing information and resource coordination. At the request of membership or a decision of leadership, the HERC may choose to facilitate or support an after action process to identify areas of strength or improvement.

The deactivation of the regional annex is up to the digression of the HERC coordination for when regional support is no longer required.

HERC Roles and Responsibilities

Preparedness

- Provide and support regional training and exercises
- Communicate with the Burn Surge Facilities to verify their involvement in the BMCI plan and discuss resource needs
- Provide and support the creation of local burn plans (See Appendixes A through F for example information)
- Relay information from BSFs to OPEHC to update statewide plans

Response

- Provide support consistent with the response role during any large scale event: predominantly information sharing amongst membership, facilitation of resource support if any is available, and as a liaison to state and federal resources, if needed.
- For example, the HERC will work with the Wisconsin Department of Health Services and Wisconsin Emergency Management as needed to determine available local, state, and interstate resources. This includes access to subject matter experts at the local, state, and national level.
- When the HERC is notified of a burn event, the member organization experiencing the surge (EMS, local hospital, or BSF) may notify the HERC of any needs or requests. The HERC will then determine if such needs should be conveyed to the membership through information sharing channels (e.g., EM Resource, eICS, etc.) or conveyed to state partners for a wider dissemination.

Recovery



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- Continue to support information sharing and resource request needs
- Support mental health needs of first responders and other regional partners involved in the response
- Ensure involved EMS and Hospitals have provided debriefings
- Provide or participate in after-action reviews of the incident and response

Burn Training and Resources

EMS and First Responders

EMS should have plans for the management of Mass Casualty Incidents. EMS are encouraged to use the [Wisconsin EMS Mass Casualty Incident Response Planning Guide](#) to guide their Mass Casualty Incident Response Plan.

The Burn Centers have approved guidelines for EMS regarding the initial management and transport of patients with burns.

- EMS Medical Directors are encouraged to use these “Guidelines” and include them in their operational protocols.
- These “Guidelines” should be incorporated in the protocol books that are carried on each ambulance.
- EMS should carry the supplies on their ambulance as recommended by the “Guidelines.”

Paramedics and Advanced EMTs may take advantage of the Advanced Burn Life Support course, [ABLS Now](#)®.

UW Health offers quarterly courses on the initial management of burn incidents with a focus on pre-hospital EMS operations and preliminary ED activities. The information in the course is based off of and follows ABLS guidelines. These courses will be expanded and supported by Columbia St. Mary's and Children's Hospital to provide additional availability and pre-recorded classes (See State Burn Plan for additional information).

Hospitals

The Wisconsin Department of Health Services has funding for training available for hospital personnel. DHS works in conjunction with ABA to purchase training seats via grant funds. The following individuals are recommended to take an ABLS course offered by ABA:

1. Nurses: There should be 24-hour nursing care for any burn patient. Nurses should have successfully completed ABLS Now® from the American Burn Association. Multiple nurses should receive this training, so at least one ABLS trained nurse is available on each shift.



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2. Physicians: There should be 24/7 physician consultation available. Physicians should have ABLS Now© from the American Burn Association. It is recommended that at least one Emergency Department physician and one General Surgeon receive this training.

Other Staff that care for burn patients may also take advantage of the ABLS Now© (e.g. Respiratory Therapists, etc.) at the discretion of the hospital.

Appendix A: Additional Resources

Link	Resource
https://www.dhs.wisconsin.gov/publications/p02587.pdf	Contact information for HERC Regional Coordinators
Not Released as of 04-09-2021	Wisconsin State Burn Surge Plan
http://ameriburn.org/education/abls-program/?_sm_au_=iVVQS1nZR6pTMqjRBLQtvK7BJGKjp	Advanced Burn Life Support (ABLS) Training
http://ameriburn.org/education/	ABLS Now©
http://ameriburn.org/public-resources/burn-center-referral-criteria/	American Burn Association Burn Center Referral Criteria
http://ameriburn.org/public-resources/burn-center-regional-map/?location=cincinnati	Regional Burn Centers
https://www.dhs.wisconsin.gov/publications/p01098.pdf	Wisconsin EMS Mass Casualty Incident Response Planning Guide



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Appendix B: Advanced Burn Life Support (ABLS) Training

Advanced Burn Life Support (ABLS) programs provide knowledge for immediate care of the burn patient up to the first 24-hours post injury. ABLS programs also support emergency preparedness and mass casualty incidents focusing on triage, burn survivability, prioritizing transport of patients, and patient treatment. ABLS is available for a wide range of burn care professionals.

Each hospital may designate those staff persons that are to take ABLS Now© from the American Burn Association. Recommended participants at each hospital for this training are:

- Multiple Registered Nurses so that at least one ABLS trained nurse is available per shift
- 1 Emergency Department physician
- 1 General Surgeon
- Other staff involved in the treatment of burn patients
- EMS staff associated with the hospitals
- Paramedics or Advanced-level EMTs

There is no maximum number of staff that can be trained under this funding program.

ABLS Now© is designed to provide hospital staff treating burn victims with the ability to assess and stabilize patients with serious burns during the first critical hours following injury and to identify those patients requiring transfer to a burn center. The course is not designed to teach comprehensive burn care, but rather to provide information that will enable those who only rarely treat burn patients to provide the care needed by a burn patient in the first 24 hours after injury or, in a mass casualty incident, for up to 72 hours.

The certification for ABLS is valid for a 4-year period.

Please contact your Regional Hospital Emergency Readiness Coalition Coordinator for information about this course.



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Appendix C: American Burn Association Burn Center Referral Criteria

The following categories of burns are appropriate for referral and transfer to a Burn Center:

1. Partial thickness burns greater than 10% total body surface area (TBSA).
2. Third-degree burns in any age group.
3. Electrical burns, including lightning injury.
4. Chemical burns.
5. Inhalation injury.
6. Burn injury in a patient with pre-existing medical disorders that could complicate management, prolong recovery or affect mortality
7. Any patients 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 center. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.
8. Burned children in hospitals without qualified personnel or equipment for the care of children.
 - a. Note: It is the recommendation of Children's Hospital of Wisconsin that pediatric burn patients, who meet the above criteria be transferred to Children's Hospital of Wisconsin or to the University of Wisconsin or to a state adult Burn Center, or if this is not possible to a hospital with a Pediatric Intensive Care Unit.
9. Burn injury in patients, who will require special social, emotional, or rehabilitative intervention: burns that involve the face, hands, feet, genitalia, perineum, or major joints.



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Appendix D: Consensus Guidelines for the Initial Management of Burns by EMS

These Consensus Guidelines is intended to be used by EMS on a daily basis (also in disaster incidents) for ALL burn patients.

Signs & Symptoms:

1st degree burns (superficial): Reddened skin that blanches with pressure

2nd degree burns (partial thickness): Moist, red, weeping surface, intact or broken blisters, painful

3rd degree burns (full thickness): Dry, pale, dark red, white, brown or charred skin, may be painless

Airway compromise: Wheezing, dyspnea, hoarseness, stridor

Inhalation injury: Facial burns, singed nares, carbonaceous sputum, enclosed space fire, altered LOC

Obtain History of:

PMH/Meds/Allergies

Recent illness or trauma

History of event, mechanism of injury, other trauma (falls, loss of consciousness, etc), time of injury:

- Electrical contact (AC/DC, amps, volts or lightning)
- Enclosed or open space exposure
- Type of chemical or toxic exposure
- Duration & concentration of exposure
- Presence of fire, smoke, or distinctive odors

Notes:

1. Guidelines for children apply for children under age 12 or < 36 kg (Broselow)

- 2. TBSA = Total burn surface area • Stop the burning process (remove clothing)

General Guidelines

- Assess ABC's (airway, breathing, circulation)
- Establish IV access
- Treat pain
- Remove jewelry or other potentially constricting items
- Look for other trauma
- Keep environment warm
- Frequent vital signs & assessment of peripheral pulses: *BP can be taken on burn extremities*
- Electrical burns: EKG monitoring, look for contact wounds
- Chemical burns: Copious irrigation with warm water. *Brush dry chemicals off prior to irrigation, certain chemicals require special considerations (e.g. hydrofluoric acid)*
- Transport patients in clean, dry sheet (or burn sheet) – no ointments



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Consider transport to nearest burn center.

Airway Control/Inhalation Injury

- Titrate > 94%
- Look for signs of inhalation injury.
 - Consider potential for inhalation injury in all victims of closed-space injury.
 - Consider potential for inhalation injury in all those who inhaled fumes or steam.
 - Carbon monoxide & cyanide are commonly present in closed-space fires.
- Consider intubation.
 - Evidence of airway compromise
 - Significant decrease in mental status
 - Circumferential partial or full thickness chest burns
 - Extensive burns or facial burns

Assessment of Injury

- Lund-Browder diagram preferred (or Rule of 9's) for adults.
- Lund-Browder diagram preferred for children. (*Patient's* palm, including fingers = 1%, may also be used.)

Fluid Resuscitation – See Appendix E

Adults and children > 30 kg:

- Parkland formula: 2-4ml/kg/TBSA % with Lactated Ringers with burns ≥ 15% for partial or full thickness burns with half in the first 8 hours, and the second half over the next 16 hours.
- Normal saline is acceptable pre-hospital, but prefer use of LR (or balanced salt solution).

Children < 30 kg: Parkland formula + maintenance fluids

- Parkland formula: 3-4ml/kg/TBSA % with Lactated Ringers with burns ≥ 15% for partial or full thickness burns

Pain control

- Narcotics as needed:
- Call for ALS intercept if needed for pain control.
- Consider anti-anxiety medications in addition to pain meds.
- Monitor SaO₂ and ETCO₂

Monitoring Resuscitation

- Adjustments to fluid rate will be dependent upon patient response.
- Foley catheter: 15% TBSA or greater
- Goal urine output:
 - Children < 30 kg: 1-2 ml/kg/hr



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- Children > 30 kg: 1 ml/kg/hr
- Adults: 0.5 ml/kg/hr or 30-50 ml/hr

The Parkland formula is a guideline: Both over and under resuscitation causes problems.

These Consensus Guidelines were developed by:

- Children's Hospital of Wisconsin Burn Center (Milwaukee)
- Columbia St. Mary's Milwaukee Burn Center (Milwaukee)
- Regions Hospital Burn Center (St. Paul, Minnesota)
- University of Wisconsin Hospital & Clinics Burn Center (Madison)



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Courtesy of the

American Burn Association

Advanced Burn Life Support (ABLS)

Learn more about the ABA and ABLS at www.ameriburn.org

Burn Center Referral Criteria

A burn center may treat adults, children, or both.

Burn injuries that should be referred to a burn center include:

1. Partial thickness burns greater than 10% total body surface area (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. Burned children in hospitals without qualified personnel or equipment for the care of children.
10. Burn injury in patients who will require special social, emotional, or rehabilitative intervention.

*Excerpted from Guidelines for the Operation of Burn Centers (pp. 79-86).
Resources for Optimal Care of the Injured Patient 2006. Committee on
Trauma, American College of Surgeons*

Severity Determination

First Degree (Partial Thickness)

Superficial, red, sometimes painful.

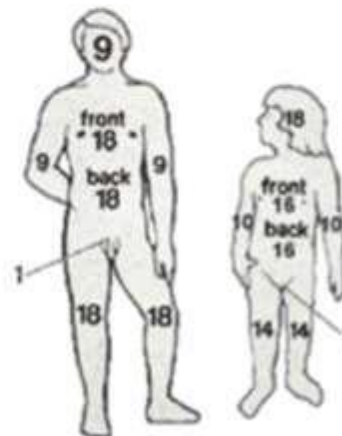
Second Degree (Partial Thickness)

Skin may be red, blistered, swollen. Very painful.

Third Degree (Full Thickness)

Whitish, charred or translucent, no pin prick sensation in burned area.

Percentage Total Body Surface Area (TBSA)





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Appendix E: Consensus Guidelines for the Initial Management of Burns by Hospitals

Hospitals are to use these Consensus Guidelines only in burn surge incidents

Signs & Symptoms:

1st degree burns (superficial): Reddened skin that blanches with pressure

2nd degree burns (partial thickness): Moist, red, weeping surface, intact or broken blisters,

painful 3rd degree burns (full thickness): Dry, pale, dark red, white, brown or charred skin, may be painless

Airway compromise: Wheezing, dyspnea, hoarseness, stridor

Inhalation injury: Facial burns, singed nares, carbonaceous sputum, enclosed space fire, altered LOC

Obtain History of:

PMH/Meds/Allergies

Recent illness or trauma

History of event, mechanism of injury, other trauma (falls, loss of consciousness, etc), time of injury:

- Electrical contact (AC/DC, amps, volts or lightning)
- Enclosed or open space exposure
- Type of chemical or toxic exposure
- Duration & concentration of exposure
- Presence of fire, smoke, or distinctive odors

Notes:

1. Guidelines for children apply for children under age 12 or < 36 kg (Broselow)

- 2. TBSA = Total burn surface area • Stop the burning process (remove clothing)

General Guidelines

- Stop the burning process (remove clothing)
- Assess ABC's (airway, breathing, circulation)
- Establish IV access
- Treat pain
- Remove jewelry or other potentially constricting items
- Look for other trauma
- Keep environment warm
- Frequent vital signs & assessment of peripheral pulses: *BP can be taken on burn extremities*
- Limit oral intake to ice chips sparingly
- Electrical burns: EKG monitoring, look for contact wounds Consider rhabdomyolysis.
- Chemical burns: Copious irrigation with warm water. *Brush dry chemicals off prior to irrigation, certain chemicals require special considerations (e.g. hydrofluoric acid)*
- Immunize against tetanus
- Refer to Burn Center based upon State BMCI Plan



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- Transport patients in clean, dry sheet, burn sheet, or saran wrap – no ointments
- Method of transport per collaborative agreement of sending/receiving facility

Airway Control/Inhalation Injury

- Titrate > 94%
- Look for signs of inhalation injury.
 - Consider potential for inhalation injury in all victims of closed-space injury.
 - Consider potential for inhalation injury in all those who inhaled fumes or steam.
 - Carbon monoxide & cyanide are commonly present in closed-space fires.
- Consider intubation.
 - Evidence of airway compromise
 - Significant decrease in mental status
 - Circumferential partial or full thickness chest burns
 - Extensive burns or facial burns
- ABG's & CO level is suspected inhalation injury

Assessment of Injury

- Lund-Browder diagram preferred (or Rule of 9's) for adults.
- Lund-Browder diagram preferred for children. (*Patient's* palm, including fingers = 1%, may also be used.)

Fluid Resuscitation

It is important to emphasize that the volume of fluid actually infused in practice is adjusted according to the individual patient's urinary output and clinical response. Although being able to estimate and predict how the 24-hour burn resuscitation might unfold is highly valuable, the actual 24-hour total resuscitative volumes patients receive are highly variable due to patient variability in the response to injury.

Adults and children > 30 kg:

- Parkland formula: 2-4ml/kg/TBSA % with Lactated Ringers with burns ≥ 15% for partial or full thickness burns
- Normal saline is acceptable pre-hospital, but prefer use of LR (or balanced salt solution) once at ED.
 - *Half given in first 8 hours; the remainder during the next 16 hours*

Children < 30 kg: Parkland formula + maintenance fluids

- Parkland formula: 3-4ml/kg/TBSA % with Lactated Ringers with burns ≥ 15% for partial or full thickness burns
 - *Half given in first 8 hours; the remainder during the next 16 hours*
- Maintenance fluid with D5LR or D5/0.2 NaCL with 20 KCL/liter (discretion of receiving facility)
 - 4 ml/kg/hr or 100 ml/kg/day for first 10 kg, plus
 - 2 ml/kg/hr or 50 ml/kg/day for second 10 kg, plus



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- 1 ml/kg/hr or 20 ml/kg/day for all further kg
 - *Important to administer maintenance fluid with 5% dextrose-containing solutions, along with resuscitation due to limited glycogen stores in young children*

Pain control

- Narcotics as needed:
- Consider anti-anxiety medications in addition to pain meds.

Monitoring Resuscitation

- Adjustments to fluid rate will be dependent upon patient response.
- Foley catheter: 15% TBSA or greater
- Goal urine output:
 - Children < 30 kg: 1-2 ml/kg/hr
 - Children > 30 kg: 1 ml/kg/hr
 - Adults: 0.5 ml/kg/hr or 30-50 ml/hr
- The Parkland formula is a guideline: Both over and under resuscitation causes problems. The rate should be adjusted up or down by (10% or by 1/3) to keep the urine output within the above goal range.
- Foley catheter is needed if Parkland formula is used.

Treatment Priorities for Delayed Transfer to a Burn Center (up to 24-48 hours)

Use treatment guidelines as above. *Consult burn center with questions (physician, nursing or therapy).*

Volume Resuscitation

- Resuscitation formula is a starting point for predicting resuscitation needs
- Volume resuscitation needs to be modified based upon patient response to ensure organ perfusion, but prevent volume overload.
- Monitor urine output according to guidelines, and adjust resuscitation as needed.
- Consult with Burn Center regarding ongoing fluid resuscitation needs.
- Circumferential burns
 - Assess circulation to extremities.
 - Consult with burn center physician about need for escharotomies.

Wound Care

- Wound care does not take precedence over life-threatening injuries or resuscitation.
- Assure appropriate pain control and ability to maintain airway.
- Gowns & gloves for all contact with wounds. Add a mask when wounds are open.
- Debride loose epidermis and blisters > 2 cm.
- Cleanse wounds with soap and warm water. Remove topical agents and provide gentle debridement.



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- Apply silver sulfadiazene, bacitracin or double antibiotic ointment (bacitracin/polymyxin) into gauze for burn dressings once or twice per day.
- After wound cleansing, use only bacitracin or double antibiotic ointment (bacitracin/polymyxin) for facial burns.
- No prophylactic antibiotics should be given.

Appendix

Age/TBSA Survival Grid

Provided by Jeffrey R. Saffle, MD
Director, Intermountain Burn Center
Salt Lake City, UT

CAVEAT: This grid is intended only for mass burn casualty disasters where responders are overwhelmed and transfer possibilities are insufficient to meet needs.

This table is based on national data on survival and length of stay.

Triage Decision Table of Benefit-to-Resource Ratio based on Patient Age and Total Burn Size

Age/ years	Burn Size (%TBSA)									
	0 – 10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91+%
0-1.99	High	High	Medium	Medium	Medium	Medium	Low	Low	Low	Expectant
2-4.99	Outpatient	High	High	Medium	Medium	Medium	Medium	Low	Low	Low
5-19.9	Outpatient	High	High	High	Medium	Medium	Medium	Medium	Medium	Low
20-29.9	Outpatient	High	High	High	Medium	Medium	Medium	Medium	Low	Low
30-39.9	Outpatient	High	High	Medium	Medium	Medium	Medium	Medium	Low	Low
40-49.9	Outpatient	High	High	Medium	Medium	Medium	Medium	Low	Low	Low
50-59.9	Outpatient	High	High	Medium	Medium	Medium	Low	Low	Expectant	Expectant
60-69.9	High	High	Medium	Medium	Medium	Low	Low	Low	Expectant	Expectant
70+	High	Medium	Medium	Low	Low	Expectant	Expectant	Expectant	Expectant	Expectant

These Consensus Guidelines were developed by:

- Children's Hospital of Wisconsin Burn Center (Milwaukee)
- Columbia St. Mary's Milwaukee Burn Center (Milwaukee)
- Regions Hospital Burn Center (St. Paul, Minnesota)
- University of Wisconsin Hospital & Clinics Burn Center (Madison)



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Appendix F: Summary of Treatment Algorithm for Burn Victims

Step 1: STOP the BURN and SECURE the SCENE.

Extinguish flames, cool scalds, flush chemicals, and complete decontamination to protect patient and health care providers from further injury. Ensure scene safety!

Step 2: COMPLETE a PRIMARY SURVEY.

- Airway: facial burns, facial swelling, singed nasal hair
- Breathing: wheezing, stridor, carbonaceous sputum
- Circulation: circumferential burns, diminished pulses
- Do NOT intubate for facial burns alone; use standard indications for intubation.

Step 3: COMPLETE A SECONDARY SURVEY. Evaluate carefully for non-burn injuries.

Most other injuries take priority over cutaneous burns. Use standard trauma management for other injuries: suture lacerations, splint fractures, etc. IVs placed through burns should be sutured in place. Be sure to rule out all other injuries. Patients who require immediate surgery should have burn resuscitation continued throughout. Burn wounds can be considered very clean for the first 12-24 hours following injury.

Step 4: DEBRIDE/DIAGRAM the BURNS. Debride all burn wounds and diagram/document extent and depth of burns.

BE METICULOUS: Much depends on accurate burn assessment. Use the Lund and Browder Chart if available; otherwise, use Rule of Nines. Remember that the patient's palm (with fingers) is 1% of total body surface. Create a diagram of wounds; consider digital photos.

Step 5: BEGIN RESUSCITATION. Fluid resuscitation is the most important step in initial burn treatment.

1. Formal fluid resuscitation is indicated for any patient with burns >10% TBSA and for patients with multiple traumas, inhalation injury or chemical or electrical burns.
2. Initial by EMS
 - a. 125 mL/hr < 5 yrs. of age
 - b. 250 mL/hr 6-13 years of age
 - c. 500 mL/hr adults > 14 years of age
3. On arrival to hospital, after TBSA is calculated
 - a. Calculate the 24 hour volume using the formula 2 mL/kg/%TBSA
 - i. calculates the 24-hour volume, give half of that in the first 8 hr
 - ii. Divide this number by 16 to give you the initial hourly rate
4. Fluid should be adjusted to maintain appropriate urine output:
 - a. Patients less than 10Kg
 - i. 2.0mL/Kg/hr
 - b. Patients 10-29 kg
 - i. 1.0mL/Kg/hr
 - c. Patients >30 kg



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i. 0.5mL/kg/hr

5. Add glucose for those less than 10kg: D5 1/2NS or D5LR at 4mL/kg
 - a. Do not adjust this fluid rate. Only discontinue when enteral feeding has started
6. Place a foley catheter. Keep NPO. Consider NG tube.
7. Use IV narcotics for pain control.

Step 6: Triage Disposition: These decisions should be made in consultation with Lead Burn Center



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Appendix: G: Initial Burn Assessment and Treatment guidelines

A PDF version can be requested from Ascension Columbia St. Mary's

Ascension Columbia St. Mary's Regional Burn Center INITIAL BURN ASSESSMENT & TREATMENT

Burn Center Referral Criteria

A burn center may treat adults, children, or both.

Burn injuries that should be referred to a burn center include:

1. Partial-thickness burns greater than 10% total body surface (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 judgement will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.
9. Burned children in hospitals without qualified personnel or equipment for the care of children.
10. Burn injury in patients who will require special social, emotional, or rehabilitative intervention.

Excerpted from guidelines for the Operation of Burn Centers (pp 79-86), Resources for Optimal Care of the Injured Patient 2006 Committee on Trauma, American College of Surgeons.

ASSESSMENT

1. Examine Patient

- Assess for other trauma
- Obtain circumstances surrounding burn injury and past medical history
- Burns do not alter LOC. If LOC is altered, look for another cause: smoke inhalation, anoxia, head injury, etc.

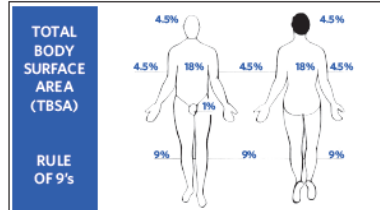
2. Determine Degree of Burn

- 1st degree: light to bright red, painful, sunburn-appearing
- 2nd degree (partial thickness): bright red, moist, painful
- 3rd degree (full thickness): white, brown or black, may appear dry, charred or leathery and no sensation

3. Estimating Extent of Burn: Use rule of 9's for adults

Scattered burns: Patient's hand and fingers = 1% TBSA
 Infants/Small Children: Head = 18%, each arm = 9%, each leg = 14%
 Chest = 18% and Back = 18% (Essentially taking 4% from each leg, and 1% from perineum to add to the head)

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TREATMENT

Minor Burns

- Cool for 3-5 minutes with tap water for pain relief if burn is ≤ 5% TBSA
- Gentle cleansing with mild soap and water
- Dressings per institutional protocol
- Follow-up care as needed

Severe Burns

Airway

- Maintain airway and use oxygen as needed
- Assess for inhalation injury

Fluid Resuscitation

- Secure veinway: large bore peripheral IVs
- Small frequent doses of IV narcotics as needed for pain control
- Use Lactated Ringers, Plasmalyte or Normosol
- IV rates during pre-hospital management and primary survey in the hospital
 - ≤ 5 years 125 mL/hr.
 - 6-13 years 250 mL/hr.
 - ≥ 14 years 500 mL/hr.

- IV rates during secondary survey after TBSA assessment

All burns (excluding electrical)

- Adults & Children ≤ 14 years = 2mL x kg x % TBSA
- Children < 14 years = 3mL x kg x % TBSA
- Infants and Children ≤ 30 kg = 3mL x kg x % TBSA

Electrical Injury

- All ages = 4mL x kg x % TBSA
- Plus DSLR at maintenance rate for infants and children ≤ 30 kg

Urine Output Goals

- Adults & children ≤ 14 yrs (> 30 kg.) 0.5 mL/kg/hr. (or 30-50 mL/hr.)
- Children ≤ 30 kg 1 mL/kg/hr.

Increase or decrease fluids by 1/3 to reach goals

Chemical Burns

- Brush dry chemicals off prior to irrigation
- Copious, continuous irrigations with water to the wound
- Call or use resources for specific treatment of chemical involved

Electrical Burns

- Cardiac monitoring
- Examine for electrical contact wounds
- IV rate to maintain urinary output at 1 mL/kg/hr. (75-100 mL/hr. for adults)
- Injury could be responsible for arrhythmias, hypertension, seizures, fractures and renal failure

Inhalation Injury

- Suspect if fire occurred in closed space (e.g. house fire)
- Maintain airway and supply 100% oxygen
- Intubate for evidence of, or risk for airway compromise
- If ET tube < 7.5 consider early exchange to larger tube
- Signs of elevated carboxyhemoglobin levels include: altered mental status or headache
- If inhalation injury is suspected and bicarb is < 16 consider cyanide toxicity and discuss need for treatment with burn surgeon
- Include ABGs and carbon monoxide level with labs

General Care

- Pulse, blood pressure and urine output hourly if stable, more frequently if necessary
- Small frequent doses of IV narcotics for pain control as needed
- Limit oral intake to ice chips sparingly
- Immunize against tetanus
- Check peripheral pulses; remove jewelry or other potentially constricting items

Hospital Transfer (Adults)

- Cover burns with clean, dry, sheet or dressing
- Maintain core body temperature by adding blankets as needed, warm room, etc.
- May place plastic wrap over wound to keep patient warm and help with pain control
- DO NOT wrap in wet sheets, blankets or apply ice
- DO NOT apply creams or ointments to burns

FOR BURN TRANSFERS CALL

MILWAUKEE METRO AREA (414) 272-BURN (2876)

OUTSIDE METRO AREA (800) 272-BURN (2876)

For additional burn education on care of burns or Advanced Burn Life Support courses (ABLS) call 414-585-1163.





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All NEW HERC Member organizations are provided an opportunity to provide input into the creation of this plan. This plan is reviewed annually and following major incidents or large-scale exercises as a means to ensure the Board and NEW HERC membership has knowledge of all NEW HERC plans and processes.

Board Member Position	Signature	Date
President	DocuSigned by: <i>Genny Willemson</i>	6/26/2022
Vice President	DocuSigned by: <i>Bill Manis</i>	8/3/2022
Secretary	DocuSigned by: <i>Stephanie Smith</i>	6/30/2022
Treasurer	DocuSigned by: <i>[Signature]</i>	6/24/2022
Hospital Rep	DocuSigned by: <i>Dave Kobielak</i>	7/25/2022
Public Health Rep	DocuSigned by: <i>Sara Lomson</i>	6/28/2022
LTC Rep	DocuSigned by: <i>Nancy Bohman</i>	6/27/2022
EMS Rep	DocuSigned by: <i>Deborah Holschbach</i>	6/29/2022
EM Rep	DocuSigned by: <i>Lauri Maki</i>	6/30/2022
Fire Rep	DocuSigned by: <i>Chris Holod</i>	6/27/2022
Oneida Rep	DocuSigned by: <i>Kaylann Gresham</i>	6/30/2022
Menominee Rep	Open Position	N/A
Law Enforcement Rep	DocuSigned by: <i>Brian Kohlmeier</i>	6/27/2022