Michigan MCI Burn Surge Plan Overview

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Establish systems that can provide triage treatment and initial stabilization for at least:

- 500 cases/million for patients with symptoms of acute infectious disease (especially smallpox, anthrax, plague, tularemia and influenza)
- 50 cases/million for patients with symptoms of acute botulinum intoxication or other acute chemical poisoning (especially from nerve agent exposure)
- 50 cases/million for patients suffering burn or trauma; and
- 50 cases/million for patients with symptoms of radiation-induced injury (especially bone marrow suppression)
Michigan Capacity (Lack of)

Michigan: 10 Million population  500 burn casualties
6 Michigan Burn Centers - 79 beds

- Bronson Medical Center - Region 5
- Children’s Hospital of Michigan – Region 2 South
- Detroit Receiving/Children’s Hospital of MI – Region 2 South
- Hurley Medical Center – Region 3
- Spectrum Health System – Region 6
- University of Michigan Health System- Region 2 South
Civilian/Natural Disasters Persist
Recent Near Miss
Just Imagine...
General Concepts Underlying the Michigan Plan

- Supplement (not replace) the ABA’s (American Burn Association) national preparedness efforts
- Build on and reinforce (but not re-invent) the infrastructure that has been built for disaster and emergency response
  - Utilize Healthcare Coalition Infrastructure including MCC
  - Healthcare Preparedness Program deliverables
  - National Incident Management System
- Prepare to be self-sufficient (local/regional) for the initial post-incident period
- Resuscitation, stabilization & wound care

[Michigan Public Health Preparedness Logo]
Purpose of MCI Burn Plan

- Augment local resources
- Stress associated with increased # of burn patients
- Guidance, Structure & Support
- Uniform treatment of burn patients
- Categorization of hospital resources
- Established surge resources deployed regionally
- Training and education
- Consistent communication pathway
Timeline

- 2008 Committee convened
- U of MI Health system - State Burn Coordinating Center
- Detroit Receiving Back Up to SBCC
- 2008-2010 Burn Surge Facilities (BSF) – Level 1 or 2
- 1 BSF per HCC with a Burn Center (6)
- Metro Detroit 3 Burn Centers (2 adult/1Pediatric) with 2 BSF’s (population – added later)
- 2 BSF per HCC without Burn Center (rural)
- Great Lakes Healthcare Preparedness Partnership (FEMA V)
- 2010 - 2013 MOU’s, Pharmaceuticals, Education, Training & Exercising
- 2014 – Completed revisions to MCI Burn Surge Plan – 21
- 2014 - Development of Pediatric Resources & EMS Practicum
Michigan’s Burn Centers
Roles, Responsibilities &
Expectations

Continue to provide great burn care
.... just to many more people.
State Burn Coordinating Center (SBCC)

Activation of SBCC in coordination with CHECC. Ongoing communications with Regional HCC MCC, Burn Centers, Burn Surge Facilities and Neighboring SBCC & ABA as necessary.
Real-time Support
SBCC Command Center in UM Burn Center

...separate from UMHS EOC
Burn Surge Facilities (BSFs)

Primary Mission:
Assist to collect, triage, resuscitate, stabilize and organize burn casualties prior to transport to definitive burn care

Burn Surge Facilities are NOT expected to deliver definitive burn care

TRAINING IS KEY
AND PROVIDED INITIALLY & ONGOING
ABLS Now On Line (Training)

- Allocated & Distributed through HCC’s
- ASPR FY 11, 12 & Budget Period 1 = 500 licenses
  - 100 unused (negotiated carryover)
- ASPR BP 2 – 5 = Purchase another 500
- Expand access
- Target Residents
- Target Paramedics
  - EMS focused hands on course in development
Identified in training and exercises - lack of pediatric expertise and resources to care for pediatric patients in a burn multi-casualty incident.
Deployable Burn Triage & Pediatric Team(s)

Team
- Flight nurse for acute and critical care expertise
- Burn nurse with special wound care expertise
- Surgeon with burn experience
  - General and plastic surgery chief residents
- Pilot/driver

Specialized Equipment/Supplies
- Burn care reference materials, critical supplies
- Video cameras and computers to record and report patient condition, enabling secondary triage at the State Burn Coordinating Center
Hands On Course Agenda

- Plan Overview
- Case Studies
- Fluid Resuscitation
- Burn Unit Tour (if in Ann Arbor)
- Stations
- Fluid Resuscitation & Database
  - Dressings
  - ABLS Practice
- ABLS Sign Off
Regional Supply Caches Pre-Positioned

Assumptions:

- There will be limited availability of essential supplies and personnel
- Transportation and deliveries will be difficult
- Adjusted standards of care will be provided during surge and crises situations
- Short term care will need to be managed by medical staff not traditionally trained in specialized burn wound care
- 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
- Maximize use of long-acting dressings – silver impregnated
Training and Reference Modules

Burn Care: Upper Extremities

Presented by:
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Assess the Wound

- Assess the web space and radius for an intact pulse
- Use doppler or pulse oximetry to assess circulation in fingers
- See the Burn Classification Module
- See the Emergency Procedure Module

Hand and Arm Burns
Multimedia On-Demand Support

Combined with video and narration into interactive modules – cookbook reference
Resuscitation Protocols

I. Burn Resuscitation Protocol
   A. Document patient’s TBSA burn using Lund-Browder diagram (Rule of Nines Diagram). Include only partial and full-thickness burns.
   B. Obtain weight or close estimate.

II. First 24 Hours Post Burn
   A. TBSA < 20%
      Maintenance IVF only until taking adequate oral intake.
   B. TBSA > 20% and Weight > 30kg
      1. Calculate estimated fluid needs:
         a) 2-4cc of LR X kg of body weight X %TBSA burned:
            - administer half of calculated amount over 8 hours
            - administer half of calculated amount over the next 16 hours
         b) If urine output < 0.5 cc/kg/hour (goal is 30-60 cc/hr):
            - increase LR infusion by 1/3 of the hourly dosage
         c) If urine output > 70 cc/hour:
            - dip urine to exclude glucosuria
            - decrease LR infusion by 1/3 of the hourly dosage
   C. TBSA > 20% and Weight < 30kg
      1. Calculate estimated fluid needs:

Burn MCI: Fluid Resuscitation

- Adult
- Pediatric
- Difficult to Resuscitate

Recommendations for the difficult fluid resuscitation:

At 12 hours after burn injury, calculate the PROJECTED 24-hour resuscitation if fluid rates are kept constant. If the projected 24-hour resuscitation requirement exceeds 6ml/kg/%TBSA, then the following steps are recommended:

1. Initiate 5% albumin (25gm/L) early as described previously in Emergency War Surgery Handbook.

2. Check bladder pressures every 4 hours.

3. If UOP <30ml/hr, strongly consider the placement of a PA catheter to guide resuscitation with specific PCWP and SvO2 goals. (Goal PCWP 10-12, SvO2 65-70%). If PA catheter placement is not practical then consider monitoring CVP from a subclavian or JI along with central venous saturations (goal CVP 8-10, ScvO2 60-65%).
   a. If CVP or PCWP not at goal then increase fluid rate.
   b. If CVP or PCWP at goal then consider levophed to augment mean arterial pressure (and thus UOP) or dobutamine 5mcg/kg/min (titrate until Svo2 or ScvO2 at goal). Max dose of dobutamine is 20mcg/kg/min.
   c. If both CVP or PCWP and SvO2 or ScvO2 at goal, then stop increasing fluids (even if UOP<30ml/hr). The patient should be considered hemodynamically optimized and the oliguria is likely a result of established renal insult. Some degree of renal failure should be tolerated and expected. Continued increases in fluid administration despite
Future Directions - Michigan

- Focus on Pre-Hospital Paramedic
  - ABLS
  - Modified Hands On Training
- Integrate Casualty Transport System Planning
- Focus on Pediatrics
  - Equipment & Supplies
  - Deployable Teams
- Expanded Exercises
  - Incorporate Non-BSF
Great Lakes Healthcare Partnership (GLHP)

- Coalition of healthcare preparedness planners from within the FEMA Region V states

- Work to develop strategies to promote multi-state and intra-regional cooperation in planning for disasters requiring a healthcare response
GLHPP Capacity (Lack Of)

- Indiana 6,589,802 = 325 patients
- Illinois 12,869,256 = 640 patients
- Michigan 9,876,187 = 500 patients
- Minnesota 5,403,925 = 270 patients
- Ohio 11,736,504 = 585 patients
- Wisconsin 5,726,986 = 285 patients

- Total U.S. burn beds = 2011 (20-30% available daily)
Lessons Learned

• Need a champion (expert) SBCC & dedicated committee
• Include Pre-Hospital (Paramedic level) early
• Roll out as important as planning
• Recruitment of BSF’s (partners) critical
• Establish MOU’s early
• Identify burn surge cache (rotation system)
• Keep routine communications
  • SBCC Newsletter & Annual Dinner Meeting
• Exercise, exercise, exercise
• Share positive outcomes for routine patient management
Lessons Learned

Education

- Initial key players identified.
- HCC responsible for maintaining #’s annually.
- BSF staff (on line & hands on) & Turnover.
- In person/Hands-On invaluable (rural).
- Taking the “show on the road” (rural).

BSF Cache Content Rotation

- Establish annual schedule with vendor.
- Communicate in advance to BSF’s.
- Establish procedure with BSF (staff turnover).

Never stop looking or listening – only get better!
Summary

- Burn disasters will occur and local burn center resources and personnel will be overwhelmed
- It will be challenging to immediately transport all burn casualties to definitive burn care facilities outside the impacted area (HCC)
- The immediate clinical need is for resuscitation, which can be rendered by non-burn facilities
- Burn care expected of the BSFs is simple (minimize wound care) and targeted to minimize the stress to local medical personnel (hopefully)
Chicago Department of Public Health

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Chicago HPP Burn Accomplishments

- Full representation in all Statewide Burn Surge Planning workgroups
- Updates/revisions to previously purchased Burn Cache to include recommendations developed by Burn Surge planning process
- Enhanced Burn Cache re-organized into “kits” to enhance delivery to affected hospitals in real time
Chicago HPP Burn Accomplishments

- Second year of Advanced Burn Life Support (ABLS) for Clinicians with #44 attendees
- ABLS in BP1 = #66 attendees
- ABLS Online (Didactic) + Simulation Lab (Innovative pre–hospital scenario based clinical portion) for #200 Chicago Fire Fighter Paramedics, Single role Paramedics and Private Provider Paramedics
Illinois Burn Surge Planning

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Illinois Burn Surge Planning

Statewide burn surge planning needed to address:

- Limited burn beds and resources in Illinois
  - Hospitals with burn capabilities = 5
    - Total burn beds = 79
    - Max surge capacity statewide = 116
- Small volume of specialized health care providers with skill set and knowledge needed to care for burn patients
- No formal collaboration/partnership among the 5 burn hospitals
Illinois Burn Surge Planning

- IDPH ESF–8 Plan: Burn Surge Annex
  - Finalized in 2014
  - Annex to state health and medical disaster plan
  - Statewide burn surge strategic/operational plan
  - Guides local/regional/statewide level response
  - Provides medical services guidance on the care of burn patients

- Development of a Burn Advisory Subcommittee
  - Assures a formal organizational structure
    - Reports to the State Trauma Advisory Council
  - Tasked with ongoing oversight to burn preparedness
Appropriate burn care for all patients in Illinois during a disaster.
MINNESOTA STATEWIDE BURN SURGE PLAN

Process Overview and Progress Update

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Snapshot of Minnesota

• There are TWO ABA accredited Burn Centers in Minnesota with a total of 35 beds.

Snapshot of Minnesota’s Hospitals

- The two Burn Centers, HCMC and Regions Hospital, are both located in the Twin Cities (Minneapolis/St. Paul) metro. They are only nine miles apart.

- 70% of hospitals in MN have fewer than 50 beds
- Over half of the hospitals in MN are designated as CAH
- To qualify for CAH, a hospital must be licensed and operating not-for-profit
  - Currently participating in the Medicare program
  - Located in a rural area (Located at least 35 miles from another hospital) or 15 if wilderness or secondary roads
  - Cannot maintain more than 25 inpatient beds
Potential Hazards in Minnesota
Conceptual Framework

The MDH/OEP Burn Surge Workgroup has designed the plan in such a manner that as it begins to fail, key components of the plan (the framework) can carry on until surge equilibrium can be achieved.
Current Status of the Burn Surge Plan

• Literature review and conference calls with SME’s in MN, as well as in other states/regions.
• Workgroup has worked closely with burn surgeons/burn nurses at the two burn centers to outline plan basics.
• An alerting and activation process for the burn surge plan has been identified, as well as identification of potential burn surge facilities
  • Level II Trauma Center
  • Interstate border issues
• A statewide process will commence in late November or early December to engage additional stakeholders in the Burn Surge Plan process.
Development of the Tool-Kit

• We are in the process of developing an accompanying “tool-kit” that will include various training and technical assistance methods (web-based, in-person training, flip-charts, videos, etc.).

• This “tool-kit” with will be customizable based on the healthcare center’s specific needs.
Next Steps

• Solidify operational framework applicability.
• Review transfer agreement MOU’s among the various health systems.
• Meet with key stakeholders and plan for late November/early December meetings.
• Identification of other essential partners.
• Training/Exercise plan and evaluation.