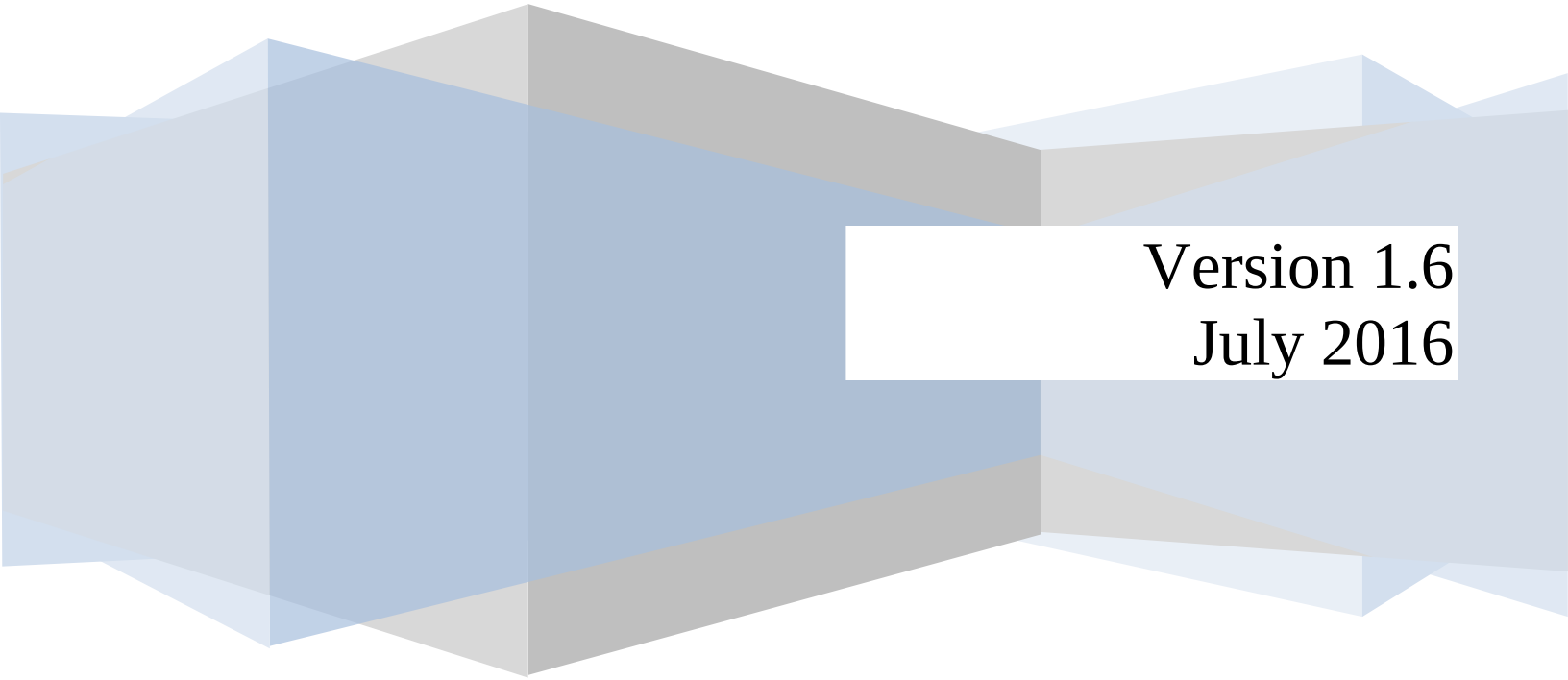
Guidance for the Ethical Allocation of Scarce Resources during a Community-Wide Public Health Emergency as Declared by the Governor of Tennessee

Developed by the Tennessee Altered Standards of Care Workgroup



Version 1.6
July 2016

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Guidance for the Ethical Allocation of Scarce Resources during a Community-Wide Public Health Emergency as Declared by the Governor of Tennessee

This guidance was prepared by the Altered Standards of Care workgroup, a partnership of the Tennessee Department of Health, the Tennessee Hospital Association, and other industry experts. The workgroup based its thinking on professional literature concerning ethics, emergency response, and public health in consultation with subject matter experts.

To develop Tennessee guidance for altered standards of care a workgroup formed in 2010. The 2010 workgroup reviewed literature on this topic along with the existing plans and guidance from a number of other states that had developed similar guidance to that point. Since that time, additional guidance and resources such as the Institute of Medicine's *Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response* was used to update this document. Our workgroup is grateful to the many other organizations and groups for their efforts to further this important work. A guidance document was vetted and released in 2015 from those efforts. In 2016, the guidance was presented to several stakeholder groups across the state and additional revisions were made to bring the plan up with the latest thinking.

It is anticipated that this document will serve as a basis for a great deal of additional discussion for best practices to care for the most people in a major public health crisis and those ideas will be incorporated into this guidance in future versions.

* * * * * * * *

The purpose of this guidance is to provide government leaders and healthcare professionals with an ethical framework to guide and support decisionmaking at the state, local and facility level during both preparation for and response to a community-wide emergency. By outlining and using these ethical values, the intent is to increase trust and solidarity among all stakeholders, including the general public. Governments, medical personnel, communities and individual citizens mayface ethical challenges as a result of scarce critical resources and overwhelming surges. This guidance is designed to implement measures rapidly to minimize illness and death, as well as the adverse impact on social order and economic stability.

The hope is that community leaders and healthcare professionals will use this information *before* public health emergencies as a basis for planning, tabletop exercises, preparatory drills and educational forums. Use of this guidance *during* a public health emergency will aid in critical decisionmaking. Catastrophic community-wide public health emergencies can raise ethical challenges for healthcare professionals and institutions at every level when the available resources cannot meet the need. In these contexts, the primary duty is to protect the health and welfare of the community, not simply that of the individual.

It is the greatest hope of the workgroup that a public health event of significant enough size to necessitate the use of this guidance never occurs in Tennessee.

Guiding Principles

The following values and principles establish an ethical framework to guide triage and the allocation of scarce resources during a situation resulting in a potential for, or high morbidity and mortality when sufficient resources are not available to meet every individual's need.

Principles to guide decision makers through community-wide public health emergency planning and response:

- **Duty to Plan**: Healthcare professionals acknowledge the responsibility to plan for allocation of limited resources during a community emergency with a high potential for morbidity and mortality because an absence of guidelines may leave allocation decisions to exhausted, over-taxed, front-line providers who typically bear a disproportionate burden in major disasters.

- **Duty to Care**: Healthcare professionals have unique responsibilities to provide care during a public health emergency with the potential to cause high morbidity and mortality. During a public health emergency, the primary duty of healthcare professionals and institutions is to the health of the public as a whole.

- **Reciprocity**: The duties owed to professional staff, non-professional staff and the community as a whole should be clearly established prior to a community-wide medical emergency, with clear lines of authority, fair allocation of schedules and worker protections.

- **Stewardship of Resources**: Due to an unavoidable scarcity of resources that may occur in public health emergencies, patients and physicians may not be able to provide every treatment as they typically would. When resources become scarce, healthcare professionals and institutions must leverage limited resources responsibly. Allocation guidelines and triage plans must reflect the goals of reducing morbidity and mortality. A responsible and appropriate stewardship of resources requires some discernment about whether or not use of a scarce resource will be effective for the community as a whole.

- **Respect for Human Dignity**: The most fundamental of these principles is the obligation to respect human dignity. For this reason, emergency operations plans and triage guidelines must be clear to everyone they affect. Every person has an inherent dignity and intrinsic moral worth, regardless of age, race, gender, creed, socioeconomic status, functional ability or any other characteristic. All people deserve equal respect as human beings. With this in mind, the allocation mechanism cannot discriminate based on anything that is not directly relevant to the eligibility of individuals to receive care as established through the triage system.

- **Communication**: Deliberations regarding triage and allocation must be participatory, community-values-based and transparent. Since these guidelines are an alteration from the normal standard of care, there is a responsibility to justify and explain these alterations to the public[1]. Moreover, public and professional cooperation are essential to an effective response. Communicating through forums, continuing education and seeking collaborative input in advance of a public health emergency is a prerequisite to implementation.

[1] See Childress et al, (2002). Public Health Ethics: Mapping the terra in. *Journal of Law, Medicine and Ethics*, 30(2), 173-5

It is recognized that during a significant public health event and the associated declared state of emergency, patients presenting to acute care hospitals may be suffering from conditions not related to the emergency event. **These guidelines should apply to ALL patients seeking care at acute care hospitals during the event. Social worth and other non-medical factors should not be used in the decision making process.**

Current State of the Hospitals in Tennessee

The influenza pandemic caused by the 2009 H1N1 virus underscores the critical need to prepare for a public health emergency of significant size and scope that could overwhelm the healthcare system. While the 2009 H1N1 pandemic was not a severe pandemic in terms of numbers of individuals critically ill, the state's healthcare resources were severely strained for several weeks. This highlights the relative fragility of the current healthcare system, given that many of Tennessee's hospitals currently operate at near capacity in "normal" times.

The 2009 event gives us a glimpse of a scenario in which thousands of people in a region suddenly seek and require medical care. This overwhelming surge on the healthcare system would dramatically strain medical resources and could compromise the ability of healthcare professionals to adhere to normal treatment procedures and conventional standards of care. Attachment B contains specific triage guidance for managing patients during an influenza surge. When limited laboratory resources are available, the Modified SOFA scale can be used (0-19 range), for triaging patients.

Architecture: IOM Report: Guidance for Establishing Crisis Standards of Care

Catastrophic events will have an impact on the entire healthcare delivery system and will affect delivery of care that occurs in the home, community, hospitals, primary care offices and long-term care facilities. A number of strategies can be implemented along this continuum of care to reduce the likelihood that standards of care will change in a disaster situation.

These include steps taken to substitute, conserve, adapt, and reuse critical resources, including the way staff are used in delivering care. All of these steps should be implemented *prior to* the reallocation of critical resources in short supply. Every attempt must be made to maintain the appropriate standards of care and patient safety until the use of altered standards is necessitated.

The Institutes of Medicine defines:

- **Conventional capacity** as the use of spaces, staff, and supplies that is consistent with daily practices within the institution. These alternate spaces and practices are used during a major mass casualty incident that triggers activation of facility emergency operations plans.

- **Contingency capacity** as the use of spaces, staff and supplies that is **not** consistent with daily practices, but provides care that is *functionally equivalent* to usual patient care practices. These spaces or practices may be used temporarily during a major casualty incident or on a more sustained basis during a disaster (when the demands of the incident exceed community resources). See: strategies section below.

- **Crisis capacity** as adaptive spaces, staff, and supplies that are not consistent with usual standards of care, but provide sufficiency of care in the setting of a catastrophic disaster (i.e., provide the best possible care to patients given the circumstances and resources available). Crisis capacity activation constitutes a *significant* adjustment to standards of care.

Table 1: Institute of Medicine matrix for treatment capacity and level of care

Incident demand/resource imbalance increases →

Risk of morbidity/mortality to patient increases →

	Conventional	**Contingency**	**Crisis**
Space	Usual patient care space fully utilized	Patient care areas repurposed (PACU, monitored units for ICU-level care)	Facility damaged/unsafe or nonpatient care areas (classrooms, etc.) used for patient care
Staff	Usual staff called in and utilized	Staff extension (brief deferrals of non-emergent service, supervision of broader group of patients, change in responsibilities, documentation, etc.)	Trained staff unavailable or unable to adequately care for volume of patients even with extension techniques
Supplies	Cached and usual supplies used	Conservation, adaptation, and substitution of supplies with occasional reuse of select supplies	Critical supplies lacking, possible reallocation of life-sustaining resources
Standard of Care	Usual care	Functionally equivalent care	**Crisis standards of care**

Usual Operating Conditions ↔ **Austere Operating Conditions**

← **Recovery**

Strategies for Scarce Resource Situations (Contingency Capacity)

A key principle of this guidance is the need to effectively manage increasingly scarce resources – including staff - in an effort to ultimately avoid the use of crisis standards (at best) and (at worst) prolong the time to crisis standards activation and/or the time crisis standards are in use. These strategies would be employed as the situation evolves from conventional to contingency as described above.

The Minnesota Department of Health has developed a set of strategies for scarce resource situations, including preparation, conservation, substitution, and adapting according to the severity of the scarcity/shortage. These include strategies for oxygen, staff, nutritional support, medication administration, hemodynamic support and IV fluids, mechanical ventilation/external oxygenation, and blood products. These Minnesota strategies along with others for scarce resource situations may be used once it is determined that an event is of significant enough size and/or duration. These strategies are included as Attachment D to this guidance.

Activation of Tennessee Guidelines for Ethical Allocation of Scarce Resources

Activation of Crisis Standards of Care (CSC) could occur suddenly as may be the case with an event like a large New Madrid earthquake or may result from a slow escalation as a result of a disease. The region of the state affected could also be either large or small. The Health Commissioner in consultation with the Governor's Office will make the declaration with the details for the particular situation. The public and health providers will be notified through Tennessee Emergency Management Agency and ESF 8 communications systems as well as other public communication channels.

The Tennessee Department of Health Mission Coordination Group (MCG) will provide expert advisory input for guidance implementation. The MCG is a standing core group composed of the Commissioner of Health, the Chief Medical Officer, the State Epidemiologist, the Emergency Preparedness Program and Medical Directors. Additionally, the Commissioner may appoint Subject Matter Experts (SMEs) appropriate to the situation to assist in determining policy, objectives, strategies, plans, and priorities for overseeing response activities for and recovery from a disaster that may cause this guidance to be initiated.

A local **decision to implement** the TN Guidance for Ethical Allocation of Scarce Resources guidelines should be based upon the degree of the public health emergency and available healthcare capacity. Specifically, Guidance for Ethical Allocation of Scarce Resources may be initiated only after all of the following conditions have been met:

- Surge capacity is fully employed within healthcare facilities and the healthcare coalition(s)
- Attempts at conservation, reutilization, adaption, and substitution have been performed maximally
- Critically limited resources have been identified (e.g., ventilators, antibiotics)
- Infrastructure resource needs have been identified (e.g., isolation, staff, electrical power)
- Resources and/or infrastructure needs cannot be met by local and regional health officials
- Requests for federal and state resources cannot be timely met.
- The appropriate institutional committee has reviewed and recommends initiation of the Guidance for Ethical Allocation of Scarce Resources

It is imperative that all healthcare coalitions and hospitals work together as much as possible to maximize all available resources. It is recognized that within individual regions and institutions, the criteria for implementation of these guidelines may occur at different times. As such, the decision to implement the guidelines will ultimately be made by individual institutional committees. The recommended committee of each institution should consist of (at a minimum):

i. The Chief of Staff (or designee)
ii. The Chief Medical Officer (or designee)
iii. The Chief Nursing Officer (or designee)
iv. The Infection Control and Prevention Nurse (or designee)
v. The Emergency Department Director (or designee)

Communication

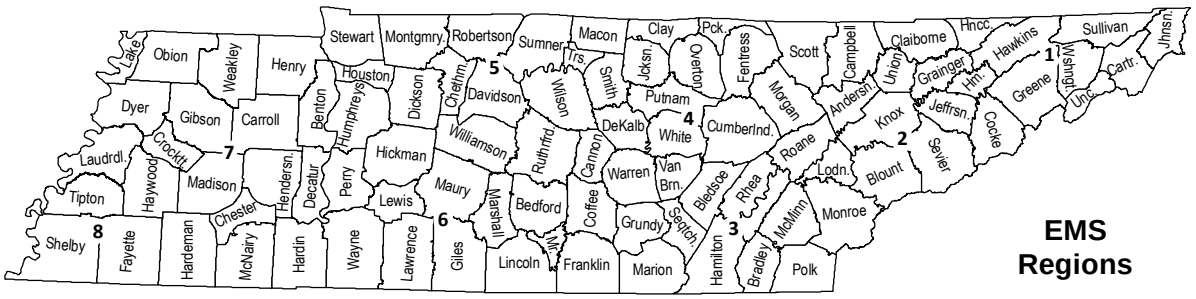
Tennessee has developed extensive preparedness and response plans and systems since the 9/11 attacks. The systems are used to actively monitor public health demands and hospital/health system capabilities and resources during major public health emergencies. These systems provide the capabilities for a common operating framework in real or near-real time, including:

- The HEALTHCARE Resource Tracking System (HRTS) which provides monitoring for hospital bed availability, facility status, resource levels/capacities, and other critical emergency response information.
- TDH Emergency Regional Coordinators (ERCs), Regional Hospital Coordinators (RHC) and state EMS consultants coordinating with Regional Health Operations Centers (RHOCs) in every major metro- and regional-area of the state
- Tennessee Health Alert Network (TNHAN) provides e-mail and telephone updates and alerts to key public health and hospital staff

- Regional Medical Communications Centers (RMCC) provide EMS with information on available medical resources

Activation of an event within HRTS engages applicable EMS Consultants, RHCs, ERCs, RMCCs, and hospitals in the affected area. In addition, applicable hospitals outside of Tennessee that are part of HRTS are notified.

The State of Tennessee Emergency Support Function (ESF) 8 response structure consists of 8 EMS regions. There is an RMCC and a Healthcare Coalition coordinating efforts in each one of the EMS regions.

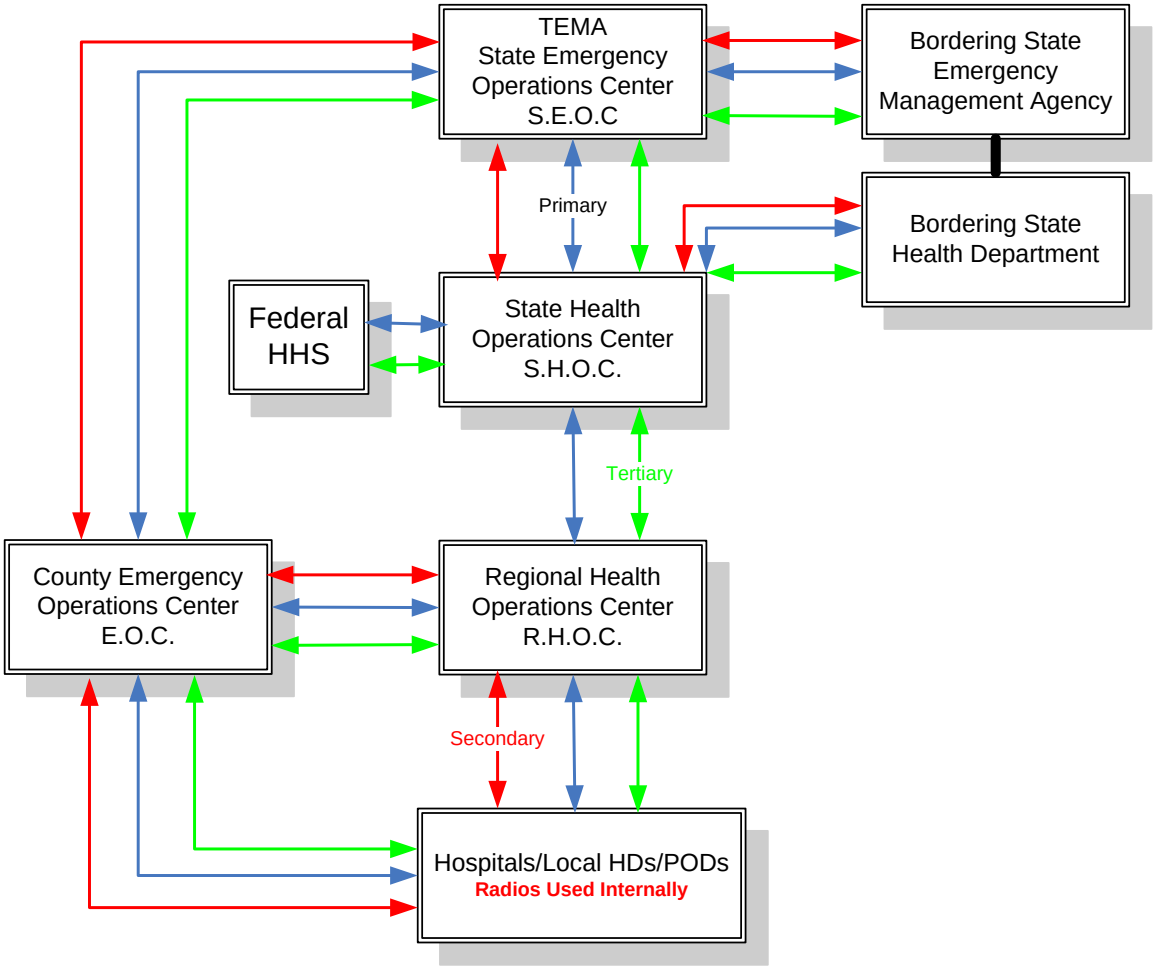


On-going monitoring of public demand and health system capabilities and resources provides the necessary information to instruct all affected hospitals in a region relative to the use of contingency and crisis standards of care. During activation of these guidelines, TDH would provide direction and coordination with 911 centers, RMCCs, and EMS agencies to assure that the altered standards of care where as widely known as appropriate. This coordinating action is key to ensuring that the most appropriate patients are transported to medical facilities while others receive the best care possible elsewhere with the current situation.

Open communication between healthcare facilities is key for an effective response during a public health emergency. Ongoing communication between hospitals should be coordinated through Regional Hospital Coordinators and Healthcare Coalitions as part of the TN ESF 8 Response Plan. Situational awareness will be ensured with frequent communication between each hospital regarding patient volume and acuity experienced by the facility, as well as resource status information. This information will be used to facilitate decision-making to determine when and how altered standards of care are implemented and deactivated. Hospitals will provide ongoing status information as requested by the State. Data will be reported using existing reporting systems. The Regional Hospital Coordinators will monitor data reports for potential trends across the affected areas.

Upon a decision to implement the Guidance for Ethical Allocation of Scarce Resources, the local emergency management agency, the county or regional state health office, and the applicable healthcare partners will be notified by the implementing institution. The communication structure for the activation and monitoring of the TN Guidance for Ethical Allocation of Scarce Resources is illustrated in Figure 1.

Figure 1: Communication Flowchart



Primary Communications:
Phone, Cell Phone, Email, and Fax

Secondary Communications:
800MHz, UHF, or VHF Radios

Tertiary Communications
Ham Radio and Satellite Phones

It is recognized that hospitals within the same affected region would likely reach the need for implementation of these guidelines at different times. However, recognizing the scope and size (and perhaps, duration) of the event, hospitals still in the contingency phase will not be expected to share their remaining limited resources. As such, the decision to implement the crisis guidelines will be made by the individual institution, after the above conditions are met and consensus has been reached by hospital leadership that no other options exist.

Upon decision for implementation of crisis standards of care, the hospital will notify the Department of Health, which will immediately notify the other hospitals in the region.

It is anticipated that the Tennessee readiness and response system noted above will also function to communicate with the hospitals in the affected region to determine when the crisis standards of care can be lifted.

Hospital and ICU Exclusions

The Altered Standards of Care Workgroup reviewed in great detail the hospital admission exclusions included in many other state plans in the context of the assumptions and scenarios presented previously in this document. Many experts from outside the workgroup were also asked to lend their perspectives.

Given our charge to do the best for the most - saving as many lives as possible with a marked scarcity of resources - there are certain medical conditions or situations where maximally aggressive care will not be able to be provided to every individual. These individuals would include:

- Those who are too ill to likely survive the acute illness (as evidenced by the Sequential Organ Failure Assessment – SOFA - score).
- Those whose underlying medical issues make their one year mortality probability so high that it is not reasonable to allocate critical care resources to them in a crisis situation (for example, end-stage ALS, metastatic carcinoma refractory to treatment, end stage organ failure.)
- Those who require such a large amount of resources that it is not feasible to accommodate their hospitalization in a prolonged mass-casualty situation.

All of the medical states or long-term conditions excluded from hospital care in this guidance meet at least one of the above criteria. In these cases, comfort care will be the priority.

The workgroup had ongoing discussion and at times disagreement regarding several possible exclusion groups. Those with known DNR status do not necessarily meet any of the three criteria above. Those with known severe dementia have a relatively high mortality and may require more care resources than may be available, but there is wide variance in the severity of the disease between individuals. The same could be said of those over 85 years old. Certainly as a group this older population is less likely to survive an acute illness, has a relatively high one year mortality rate and may very well require more resources than will be available for both acute care as well as convalescence. Again, however, there may be a wide variation in individual functional status.

There are multiple exclusion criteria from other state plans that were **not** included in the Tennessee plan as they did not particularly fall into any of the above categories. These include pregnancy, asthma, congenital heart disease that is hemodynamically significant but not NYHA Class III or IV, HIV with CD4+ < 200, severe autoimmune/rheumatologic disease and severe anemia (including but not limited to hemoglobinopathies).

The Utah Model

As noted before, the Tennessee Altered Standards of Care workgroup reviewed several other state programs and ultimately felt that the system developed by the Utah Department of Health was the best fit for our state. The final set of hospital exclusions and ICU inclusions developed by the Tennessee workgroup was inserted into the Utah plan format to create the *Tennessee Hospital and ICU Triage Guidelines for Adults, Version 1.3*, which is included as Attachment C to this document.

This guidance is built around a model that gives priority to patients for whom treatment would most likely be lifesaving and whose functional outcome would most likely improve with treatment. This priority is given over those who would likely die even with treatment and those who would likely survive without treatment.

It utilizes a list of specific diseases and conditions that would exclude patients from admission to a hospital based on the reduced survivability of their disease or condition as well as the disproportionate amount of healthcare

services and resources necessary to care for them. Care for these patients would be palliative versus curative. The model utilizes a similar set of criteria to evaluate patient admission to an Intensive Care Unit (ICU).

The disease/condition criteria are used by an establish a peer-based team of at least three individuals, including an intensivist and other hospital leaders such as the hospital medical director, a nursing supervisor, a board member, an ethicist, a pastoral care representative, and one or more independent physicians. This team provides ongoing evaluation of patients for hospital admission, intensive care admission, and termination of life-sustaining treatment.

Care Models for People Who are Not Admitted to a Hospital

When crisis standards of care are activated, certain hospital admission criteria will also be activated. Communities should consider and plan for palliative care models for those people who do not meet hospital admission criteria or who no longer meet criteria to remain in the hospital.

Home health and hospice providers will likely be overwhelmed with the event as hospitals discharge patients to be able to provide for others. However, if home health and hospice staff are available, hospitals should consider planning for these staff to support the overall community efforts, including:

- Admit to home health and hospice services. If capacity is there, this is a natural option.

- Hospice units in the hospitals. Hospices could potentially admit additional patients to existing hospice units and/or staff a unit in available hospital space.

- Directly support hospital staff with palliative care expertise.

- Support for the “atrium” model of care in the hospital by providing medical/palliative care to groups of people who choose or are forced to remain at the hospital but not in a patient care area.

Comfort packs. Many hospices currently provide “comfort packs” for families caring for loved ones at home. In a crisis situation a physician could be on site to write an order for a comfort pack to be sent home (or another location) with the patient/family. Protocol would be established specific to what is to be included in the packs.

Public Dispensing. The current Tennessee emergency Point of Dispensing (POD) system could also be used to dispense the comfort packs. The POD network that has been identified has at least one site in each of the 95 counties in Tennessee. The network currently has over 150 sites established across the state that could also be used to dispense comfort packs or other resources to the public. In addition, TDH has contracted with over 500 pharmacies in the state to provide emergency medical countermeasures. These contracts can be activated to respond to public health emergencies.

Teaching sheets. Comfort care teaching sheets could also be provided to patients and their families. This written information would provide useful ideas for caring for a loved one at home, including information about those diseases not directly related to the event.

These efforts would be in conjunction with an on-going, regularly-updated, disease/event-specific education of the public by experts and public health officials. The public should be provided information about:

- Informational phone hot-lines and other communication channels. When and how to access limited services

- When and why to stay home

- How to care for yourself

- How to care for others

- How to stop the spread of the disease or harmful agents
- Creating a family plan (provided in good times)
- Advance directives

Pediatrics

Attachment D developed by Minnesota Department of Health contains many recommendations in section 10 for the conservation and allocations of scare pediatric resources during major emergencies. The Tennessee Committee on Pediatric Emergency Care is also developing an annex to the TN ESF 8 emergency plan for the care of children during emergencies. This annex outlines measures to be taken during emergencies to respond to the needs of children.

Emergency Credentialing

In a significant public health event, hospitals may experience severe staff shortages in critical areas. At the same time, hospitals are likely to experience physician and other healthcare volunteers presenting to assist who are not members of the hospital/health system staff. Hospitals should do everything possible to adhere to existing credentialing protocols. However the circumstances of the situation may require the use of an emergency credentialing system. *Reference: Memorial Health Care System policy.*

Patient Tracking

Hospitals and other care providers will also be expected to maintain a tracking system for all those sick or injured who present for help, including those who are not admitted to the hospital. At best, this will tie into regional or state tracking efforts utilizing interoperable systems for hospitals and other providers. At a minimum, hospitals should use the HICS 254 disaster victim/patient tracking form, which is included as Attachment A.

Procedure for activating an emergency patient tracking event activation notice:

- The activation of the emergency patient tracking system will occur through HRTS messaging and/or TNHAN.
- Specific instruction based on the event will be included in the message(s).
- Receiving facilities for the emergency patient transports will generally have the initial responsibility to be sure all patients for the event are registered into a tracking system to establish a common operating picture.
- Affected regional Health Operations Centers will coordinate the collection and exchange of patient tracking information.

Under these activations, electronic patient tracking should be implemented where possible as follows:

- Each patient should be assigned a unique patient identifying number.
- Patient identifying numbers can be assigned with an armband, use of an identification card, use of a coded triage tag, registration in a web-based patient tracking system which generates a unique identification number, etc. **The assignment of a unique identification number is critical for tracking patients.**
- The unique identifying number should be used or cross-referenced in all disparate systems to ensure continuity of emergency patient tracking.
- **All attempts should be made to keep patient ID bands from previous facilities on the patient.** If ID band(s) need to be removed, attach the removed band(s) to the patient's records when transporting.

Deactivation of Tennessee Guidelines for Ethical Allocation of Scarce Resources

The Health Commissioner, in consultation with the Governor's Office, will deactivate CSC when healthcare resources are no longer at a crisis level. Messages with the deactivation details will be sent out through Tennessee Emergency Management Agency and ESF 8 communications systems. Other emergency operations may remain activated even if a state-declared CSC activation is cancelled.

Legal Environment

Emergency management powers of the governor. TCA 58-2-107

Section (e)1 states that the Governor can:

Suspend the provisions of any law, order, rule or regulation prescribing the procedures for conduct of state business or the orders or rules or regulations of any state agency, if strict compliance with the provisions of any such law, order, rule, or regulation would in any way prevent, hinder, or delay necessary action in coping with the emergency;

Section (l)(2):

If additional medical resources are required, the governor, by executive order, may provide limited liability protection to health care providers, including hospitals and community mental health care centers and those licensed, certified or authorized under titles 33, 63 or 68, and who render services within the limits of their license, certification or authorization to victims or evacuees of such emergencies; provided, however, that this protection may not include any act or omission caused by gross negligence or willful misconduct.

EMTALA: § 489.24(a)(2) (including Interpretive Guidelines for a federal waiver)

EMTALA provisions may be waived by the Secretary of Health Human Services during a declared public emergency and under the Stafford act. The Secretary can issue the Section 1135 Waiver to waive sanctions for the "transfer of an individual who has not stabilized for both transfers and redirection for a medical screening examination. Waivers are generally limited to a 72-hour period beginning upon implementation of a hospital disaster protocol, unless the Waiver arises out of a public health emergency involving a pandemic. If related to a pandemic, the Waiver terminates upon the first to occur of either the termination of the underlying declaration of a public health emergency or 60 days after being first published. If the waiver terminates because of the latter, the Secretary may extend it for subsequent 60-day periods.

https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/som107ap_v_emerg.pdf

Altered Standards of Care Workgroup

The Tennessee Altered Standards of Care workgroup led the original development of this guidance:

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Julia Morris, JD, Vanderbilt
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Winston Shields, Memorial Healthcare System, Chattanooga

Additional Resources

- Office of the Assistant Secretary for Preparedness and Response (ASPR) Communities of Interest (COI) for Crisis Standards of Care and the Allocation of Scarce Resources - http://www.phe.gov/coi

  About the COI - In response to a 2008 Government Accountability Office (GAO) recommendation, the Department of Health and Human Services (HHS), Office of the Assistant Secretary for Preparedness and Response (ASPR) developed a Communities of Interest (COI) SharePoint site (i.e., a clearinghouse) to better disseminate information and manage documents; share promising practices and ideas; and provide a workspace where users from inside and outside HHS/ASPR can come together to share documents and ideas regarding the crisis standards of care (CSC) and allocation of scarce resources (ASR). HHS/ASPR uses the term "communities of interest" to describe and include all of the interested parties involved in CSC and ASR planning.

- Agency for Healthcare Research and Quality (AHRQ) Altered Standards of Care in Mass Casualty Events - http://archive.ahrq.gov/research/altstand/

Attachment A

HICS 254 - DISASTER VICTIM/PATIENT TRACKING FORM

1. INCIDENT NAME	2. DATE/TIME PREPARED	3. OPERATIONAL PERIOD DATE/TIME

4. TRIAGE AREAS (Immediate, Delayed, Expectant, Minor, Morgue)

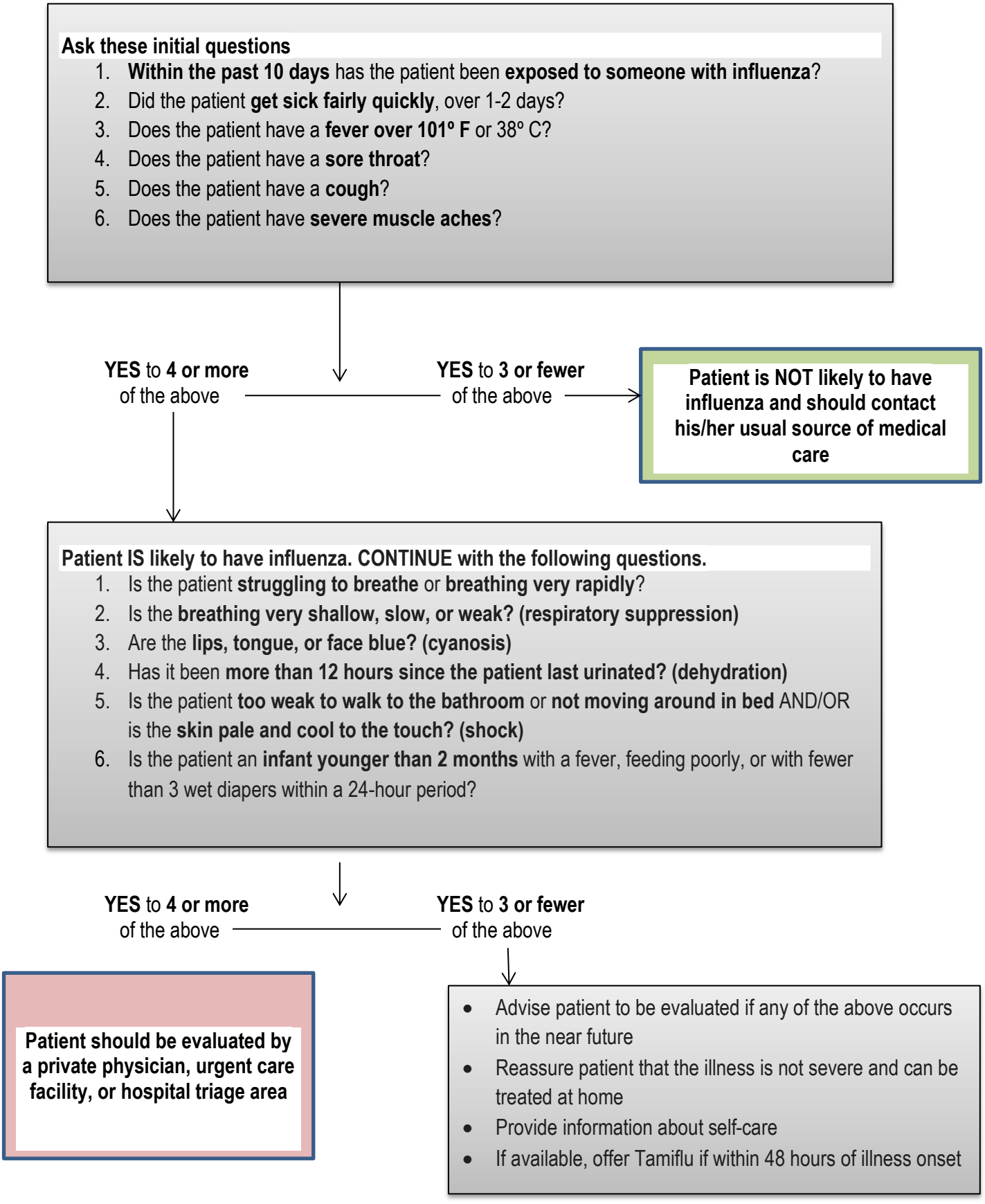
MR#/ Triage #	Name	Sex	DOB/ Age	Area Triaged to	Location/Time of Diagnostic Procedures (x-ray, angio, CT, etc.)	Time sent to Surgery	Disposition (home, admit, morgue, transfer)	Time of Disposition

5. SUBMITTED BY	6. AREA ASSIGNED TO	7. DATE/TIME SUBMITTED

8. FACILITY NAME

Attachment B: Initial Triage for Pandemic Influenza

Purpose: Initial triage is intended to help patients who are concerned about influenza determine whether or not they should seek medical help.



Tennessee Hospital and ICU Triage Guidelines for Adults During Crisis Standards of Care

Version 1.4, July 2016

Purpose

These guidelines were originally developed by the Utah Hospitals and Health Systems Association (UHA) Triage Guidelines Workgroup and adapted for use in Tennessee. The purpose is to guide the allocation of patient care resources during an influenza pandemic or other public health emergency, when demand for services dramatically exceeds supply. **Application of these guidelines will require physician judgment at the point of patient care.**

Basic Premises

- **Graded guidelines** should be used to control resources more tightly as the severity of a pandemic increases.
- **Priority should be given to patients for whom treatment would most likely be lifesaving** and whose functional outcome would most likely improve with treatment. Such patients should be given priority over those who would likely die even with treatment and those who would likely survive without treatment.

Scope

- **These triage guidelines apply to all healthcare professionals, clinics, and facilities in the state of Tennessee.**
- **The guidelines apply to all patients 14 years and older.**

Hospital and Medical Staff Planning

- **Each hospital should:**
  - **Establish a peer-based structure** for the review of hospital admission, Intensive Care Unit (ICU) admission, and termination of life-sustaining treatment. Consider a team of at least 3 individuals, including an intensivist and 2 or more of the following: the hospital medical director, a nursing supervisor, a board member, an ethicist, a pastoral care representative, and one or more independent physicians.
  - **Institute an action team** to provide counseling and care coordination and to work with the families of loved ones who have been denied life-sustaining treatment.
- **Medical staff** should establish a method of providing peer support and expert consultation to physicians making these decisions.

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Overview of Pandemic Triage Levels

Triage Level 1 Early in the pandemic	Triage Level 2 Worsening Pandemic	Triage Level 3 Worst –case scenario
• Hospitals recognize the need to surge bed capacities • Emergency departments are experiencing increased numbers • Note: In the event of a severe and rapidly progressing pandemic, start with Triage Level 2.	• Hospitals have surged to maximum bed capacity, and emergency departments are overwhelmed. • There are not enough beds to accommodate all patients needing hospital admission, and not enough ventilators to accommodate all patients with respiratory failure. • Hospital staff absenteeism is 20% to 30%.	• Hospitals have already implemented altered standards of care regarding nurse/patient ratios and have already expanded capacity by adding patients to already occupied hospital rooms. • Hospital staff absenteeism is 30% to 40%.

Pre-Hospital Settings

1. **Initial Triage**

   Applies to: Patients who appear for care in physician offices or clinics, or in pre-evaluation spaces for emergency departments;

   Implemented by: Physicians, clinic staff, pre-screening staff

   Other uses: Publish in newspapers, place in websites, etc. for self-use by public.

   ALL Triage Levels: Use INITIAL TRIAGE TOOL (Appendix A) to provide initial triage screening, as well as instructions and directions for patients who need additional care or medical screening.

2. **EMS, Physician Offices, and Clinics**

   Applies to**:** Patients who present for care or call for guidance for where to go or how to care for ill family members;

   Implemented by**:** Primary care staff, hospital help lines, community help lines, and health department help lines

   Triage Level 1**:** Use INITIAL TRIAGE TOOL (Appendix A) to evaluate patients before sending to hospital ED or treating in an outpatient facility.

   Triage Levels 2 and 3: Continue to use INITIAL TRIAGE TOOL (Appendix A) and Initiate EXCLUSION CRITERIA for Hospital Admission (page 5) to evaluate patients. Do not send patients meeting EXCLUSION CRITERIA to the hospital for treatment. Send home with care instructions (Appendices pending).

3. **Home Care, Long-Term Care facilities, and Other Institutional Facilities (mental health, corrections, handicapped)**

   Applies to: Patients in institutional facilities

   Implemented by: Institutional facility staff

   ALL Triage Levels: Ensure that all liquid oxygen tanks are full. Limit visitation to control infection.

   Triage Levels 2 and 3: Use EXCLUSION CRITERIA for Hospital Admission (page 5) to evaluate patients. Do not transfer patients meeting exclusion criteria to the hospital for treatment. Give palliative and supportive care in place.

HOSPITAL SETTINGS

Hospital Administrative Roles – General *(refer to Minnesota guidance in Attachment D for more detail)*		
Triage Level 1	**Triage Level 2**	**Triage Level 3**
1) Preserve bed capacity by: • Canceling all category 2 and 3 • elective surgeries, and advising all category 1 elective surgery patients of the risk of infection. • Canceling any elective surgery • that would require postoperative hospitalization. **Note:** Use standard operation and triage decision for admission to ICU since there are still adequate resources to accommodate the most critically ill patients. **2) Preserve oxygen capacity by:** • Phasing out all hyperbaric medicine treatments. • Ensuring that all liquid oxygen tanks are full. **3) Improve patient care capacity** by transitioning space in ICUs to accommodate more patients with respiratory failure. **4) Control infection** by limiting visitation (follow hospital infection control plan).	**1) Preserve bed capacity** by: Canceling all elective surgeries unless • necessary to facilitate hospital discharge. Evaluating hospitalized category 1 elective surgery patients for discharge using same criteria as medical patients. **2) Preserve oxygen capacity** by stopping all hyperbaric treatments. **3) Improve patient care capacity** by implementing altered standards of care regarding nurse/patient ratios and expanding capacity by adding patients to already occupied hospital rooms. **4) Provide emotional support** by initiating pre-established action team to provide counseling and care coordination and to work with the families of loved ones who have been denied life-sustaining treatment.	**1) Preserve bed capacity** by limiting surgeries to patients whose clinical conditions are a serious threat to life or limb, or to patients for whom surgery may be needed to facilitate discharge from the hospital.

Emergency Department, Hospital, and ICU - Clinical Triage

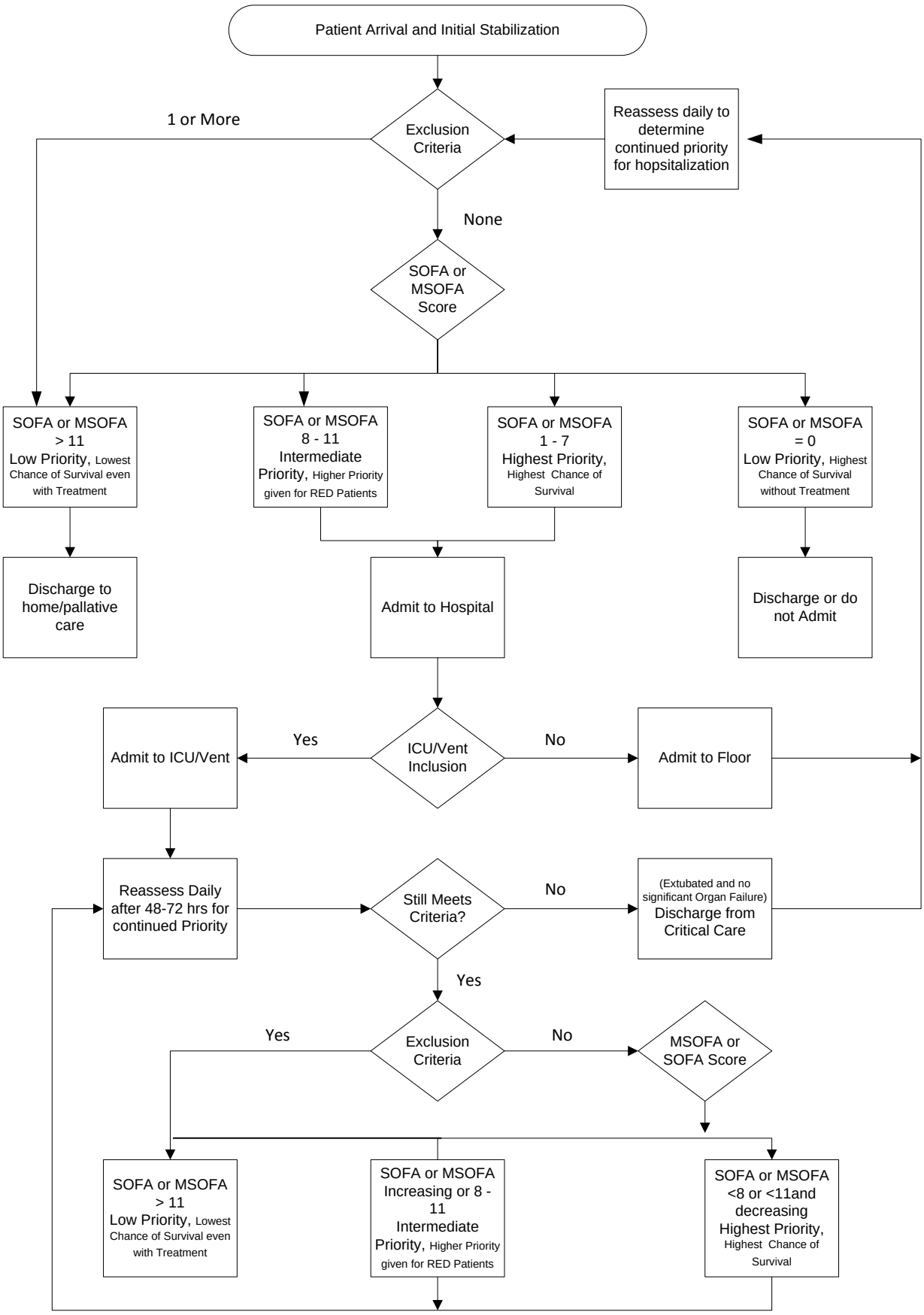
Use **HOSPITAL AND ICU/VENTILATOR ADMISSION TRIAGE** algorithm and tools (pages 4 and 5) to determine which patients to send home for palliative care or medical management and which patients to admit or keep in hospital or ICU. Note that the lowest priority for admission is given to patients with the lowest chance of survival with or without treatment, and to patients with the highest chance of survival without treatment. The Sequential Organ Failure Assessment (SOFA) Score or the Modified-SOFA (MSOFA) can be used. Utilization of SOFA requires additional blood tests. Modified SOFA only requires creatinine measurement. The cutoffs remain the same using either score, and the prediction for both is essentially the same.

Physician judgment should be used in applying these guidelines.

Triage Level 2**:** Initiate **HOSPITAL AND ICU/VENTILATOR ADMISSION TRIAGE** algorithm (page 4) to determine priority for ICU admission, intubation, and/or mechanical ventilation. Reassess need for ICU/ventilator treatment daily after 48-72 hours of ICU care.

Triage Level 3**:** Continue to use **HOSPITAL AND ICU/VENTILATOR ADMISSION TRIAGE** algorithm (page 4) to determine priority for ICU, intubation, and/or mechanical ventilation. Triage more yellow patients to floor on oxygen or CPAP. Triage more red patients who are intubated and on CPAP to floor.

ALGORITHM: Hospital and ICU/Ventilator Admission Triage



Triage Tools and Tables

(a) EXCLUSION CRITERIA for Hospital Admission:

The patient is excluded from admission or transfer to critical care if ANY of the following is present:

1. **Severe and irreversible chronic neurologic disease** with persistent coma or vegetative state
2. **Acute severe neurologic event with minimal chance of functional neurologic recovery (physician judgment).** Includes traumatic brain injury, severe hemorrhagic stroke, hypoxic ischemic brain injury, and intracranial hemorrhage.
3. **Severe acute trauma** with a **REVISED TRAUMA SCORE <2** (see **(d)** and **(e)**) GCS: _____ SBP:_ RR:_____ Revised trauma score: _____
4. **Severe burns** with **<50% anticipated survival** (body surface >40%, severe inhalation injury)
5. **Cardiac arrest not responsive to ACLS intervention at 20 minutes**, includes unwitnessed, recurrent, or trauma-related arrest
6. **Known, severe, end-stage dementia**, medically treated and requiring assistance with ADLs.
7. **Advanced untreatable neuromuscular disease** (such as ALS, end-stage MS, spinal muscular atrophy) requiring assistance with activities of daily living or requiring chronic ventilatory support.
8. **Incurable metastatic malignant disease.**
9. **End-stage organ failure** meeting the following criteria:
   - **Heart: NEW YORK HEART ASSOCIATION (NYHA) FUNCTIONAL CLASSIFICATION SYSTEM Class III or IV (g).** Class: ____
   - **Lung** (any of the following):
     - Chronic Obstructive Pulmonary Disease (COPD) with Forced Expiratory Volume in one second (FEV1) < 25% predicted baseline, Pa02 <55 mm Hg, or severe secondary pulmonary hypertension.
     - Cystic fibrosis with post-bronchodilator FEV1 <30% or baseline Pa02 <55 mm Hg.
     - Pulmonary fibrosis with VC or TLC < 60% predicted, baseline Pa02 <55 mm Hg, or severe secondary pulmonary hypertension.
     - Primary pulmonary hypertension with NYHA class III or IV heart failure **(g)**, right atrial pressure >10 mm Hg, or mean pulmonary arterial pressure >50 mm Hg.
   - **Liver: PUGH SCORE >7 (h)**, when available. Includes bili, albumin, INR, ascites, encephalopathy. Total score: ____
   - **Renal:** Irreversible, dialysis dependent
10. **Known chromosomal disease,** uniformly fatal in the first 2 years of life

(b) Modified Sequential Organ Failure Assessment (MSOFA)

	MSOFA				Score each row
Variable	**1**	**2**	**3**	**4**	
Respiratory PaO2/FiO2 (mmHg)	< 400	< 300	< 200 and mechanically ventilated	<100 and mechanically ventilated	
Nervous Glascow Coma Scale	13-14	10-12	6-9	<6	
Cardio Vascular	MAP <70mm/Hg	dop<=5 or dob (any dose)	dop>5 or epi<=0.1 or nor<=0.1	dop>15 or epi>0.1 or nor>0.1	
Liver Bilirubin (mg/dl)	1.2 - 1.9	2.0-5.9	6.0-11.9	>12.0	
Coagulation Plateletsx10-3/µl	<150	<100	<50	<20	
Renal Creatinine (mg/dl)	1.2-1.9	2.0-3.4	3.5-4.9	>5.0	
	Total MSOFA score = add score from all				

dop= dopamine in micrograms/kg/min
epi = epinephrine in micrograms/kg/min
nor = norepinephrine in micrograms/kg/min

(c) ICU/Ventilator INCLUSION CRITERIA

Patient must have **NO EXCLUSION CRITERIA** (a) and **at least one of the following INCLUSION CRITERIA:**

1. **Requirement for invasive ventilatory support**
   - Refractory hypoxemia (Sp02 <90% on non-rebreather mask or FIO2 >0.85)
   - Respiratory acidosis (pH <7.2)
   - Clinical evidence of impending respiratory failure
   - Inability to protect or maintain airway
2. **Hypotension* with clinical evidence of uncompensated shock** refractory to volume resuscitation, and requiring vasopressor or inotrope support that cannot be managed in a ward setting.**

- ***Hypotension** = Systolic BP <90 mm Hg or relative hypotension
- ****Clinical evidence of shock** = altered level of consciousness, decreased urine output, or other evidence of end-stage organ failure

PATIENT CARE
STRATEGIES FOR SCARCE RESOURCE SITUATIONS

MINNESOTA MDH DEPARTMENT OF HEALTH

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Resource Reference and Triage Cards Resource cards address the unique system response issues required by specific patient groups during a major incident. Some of this information is specific to the State of Minnesota's resources and processes.		
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PATIENT CARE
STRATEGIES FOR SCARCE RESOURCE SITUATIONS

Summary Card

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Potential trigger events:	•Mass Casualty Incident (MCI) •Infrastructure damage/loss •Pandemic/Epidemic	•Supplier shortage •Recall/contamination of product •Isolation of facility due to access problems (flooding, etc)

How to use this card set:

1. Recognize or anticipate resource shortfall
2. Implement appropriate incident management system and plans; assign subject matter experts (technical specialists) to problem
3. Determine degree of shortfall, expected demand, and duration; assess ability to obtain needed resources via local, regional, or national vendors or partners
4. Find category of resource on index
5. Refer to specific recommendations on card
6. Decide which strategies to implement and/or develop additional strategies appropriate for the facility and situation
7. Assure consistent regional approach by informing public health authorities and other facilities if contingency or crisis strategies will continue beyond 24h and no regional options exist for re-supply or patient transfer; activate regional scarce resource coordination plans as appropriate
8. Review strategies every operational period or as availability (supply/demand) changes

Core strategies to be employed (generally in order of preference) during, or in anticipation of a scarce resource situation are:

Prepare - pre-event actions taken to minimize resource scarcity (e.g., stockpiling of medications)
Substitute - use an essentially equivalent device, drug, or personnel for one that would usually be available (e.g., morphine for fentanyl)
Adapt – use a device, drug, or personnel that are not equivalent but that will provide sufficient care (e.g., anesthesia machine for mechanical ventilation)
Conserve – use less of a resource by lowering dosage or changing utilization practices (e.g., minimizing use of oxygen driven nebulizers to conserve oxygen)
Re-use – re-use (after appropriate disinfection / sterilization) items that would normally be single-use items
Re-allocate – restrict or prioritize use of resources to those patients with a better prognosis or greater need

Capacity Definitions:

Conventional capacity – The spaces, staff, and supplies used are *consistent with daily practices* within the institution. These spaces and practices are used during a major mass casualty incident that triggers activation of the facility emergency operations plan.

Contingency capacity – The spaces, staff, and supplies used are not consistent with daily practices, but provide care to a standard that is *functionally equivalent* to usual patient care practices. These spaces or practices may be used temporarily during a major mass casualty incident or on a more sustained basis during a disaster (when the demands of the incident exceed community resources).

Crisis capacity – Adaptive spaces, staff, and supplies are not consistent with usual standards of care, but provide *sufficiency* of care in the setting of a catastrophic disaster (i.e., provide the best possible care to patients given the circumstances and resources available). Crisis capacity activation constitutes a significant adjustment to standards of care (Hick et al, 2009).

This card set is designed to facilitate a structured approach to resource shortfalls at a healthcare facility. It is a decision support tool and assumes that incident management is implemented and that key personnel are familiar with ethical frameworks and processes that underlie these decisions (for more information see Institute of Medicine 2012 Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response http://www.iom.edu/Reports/2012/Crisis-Standards-of-Care-A-Systems-Framework-for-Catastrophic-Disaster-Response.aspx and the Minnesota Pandemic Ethics Project - http://www.health.state.mn.us/divs/idepc/ethics/). Each facility will have to determine the most appropriate steps to take to address specific shortages. Pre-event familiarization with the contents of this card set is recommended to aid with event preparedness and anticipation of specific resource shortfalls. The cards do not provide comprehensive guidance, addressing only basic common categories of medical care. Facility personnel may determine additional coping mechanisms for the specific situation in addition to those outlined on these cards.

The content of this card set was developed by the Minnesota Department of Health (MDH) Science Advisory Team in conjunction with many subject matter experts whose input is greatly appreciated. This guidance does not represent the policy of MDH. Facilities and personnel implementing these strategies in crisis situations should assure communication of this to their healthcare and public health partners to assure the invocation of appropriate legal and regulatory protections in accord with State and Federal laws. This guidance may be updated or changed during an incident by the Science Advisory Team and MDH. The weblinks and resources listed are examples, and may not be the best sources of information available. Their listing does not imply endorsement by MDH. This guidance does not replace the judgement of the clinical staff and consideration of other relevant variables and options during an event.

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OXYGEN

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

RECOMMENDATIONS	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Inhaled Medications • Restrict the use of Small Volume Nebulizers when inhaler substitutes are available. • Restrict continuous nebulization therapy. • Minimize frequency through medication substitution that results in fewer treatments (6h-12h instead of 4h-6h applications).	*Substitute & Conserve*			
High-Flow Applications • Restrict the use of high-flow cannula systems as these can demand 12 to 40 LPM flows. • Restrict the use of simple and partial rebreathing masks to 10 LPM maximum. • Restrict use of Gas Injection Nebulizers as they generally require oxygen flows between 10 LPM and 75 LPM. • Eliminate the use of oxygen-powered venturi suction systems as they may consume 15 to 50 LPM.	*Conserve*			
Air-Oxygen Blenders • Eliminate the low-flow reference bleed occurring with any low-flow metered oxygen blender use. This can amount to an additional 12 LPM. Reserve air-oxygen blender use for mechanical ventilators using high-flow non-metered outlets. (These do not utilize reference bleeds). • Disconnect blenders when not in use.	*Conserve*			
Oxygen Conservation Devices • Use reservoir cannulas at 1/2 the flow setting of standard cannulas. • Replace simple and partial rebreather mask use with reservoir cannulas at flowrates of 6-10 LPM.	*Substitute & Adapt*			
Oxygen Concentrators if Electrical Power Is Present • Use hospital-based or independent home medical equipment supplier oxygen concentrators if available to provide low-flow cannula oxygen for patients and preserve the primary oxygen supply for more critical applications.	*Substitute & Conserve*			
Monitor Use and Revise Clinical Targets • Employ oxygen titration protocols to optimize flow or % to match targets for SPO2 or PaO2. • Minimize overall oxygen use by optimization of flow. • Discontinue oxygen at earliest possible time. **Starting Example** / **Initiate O2** / **O2 Target** Normal Lung Adults: SPO2 <90% / SPO2 90% Infants & Peds: SPO2 <90% / SPO2 90-95% Severe COPD History: SPO2 <85% / SPO2 90% **Note**: Targets may be adjusted further downward depending on resources available, the patient's clinical presentation, or measured PaO2 determination.	*Conserve*			
Expendable Oxygen Appliances • Use terminal sterilization or high-level disinfection procedures for oxygen appliances, small & large-bore tubing, and ventilator circuits. Bleach concentrations of 1:10, high-level chemical disinfection, or irradiation may be suitable. Ethylene oxide gas sterilization is optimal, but requires a 12-hour aeration cycle to prevent ethylene chlorohydrin formation with polyvinyl chloride plastics.	*Re-use*			
Oxygen Re-Allocation • Prioritize patients for oxygen administration during severe resource limitations.	*Re-Allocate*			

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STAFFING

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Staff and Supply Planning • Assure facility has process and supporting policies for disaster credentialling and privileging - including degree of supervision required, clinical scope of practice, mentoring and orientation, and verification of credentials • Encourage employee preparedness planning (www.ready.gov and other resources). • Cache adequate personal protective equipment (PPE) and support supplies. • Educate staff on institutional disaster response. • Educate staff on community, regional and state disaster plans and resources. • Develop facility plans addressing staff's family / pets or staff shelter needs.	*Prepare*			
Focus Staff *Time* on Core Clinical Duties • Minimize meetings and relieve administrative responsibilities not related to event. • Reduce documentation requirements. • Cohort patients to conserve PPE and reduce staff PPE donning/doffing time and frequency. • Restrict elective appointments and procedures.	*Conserve*			
Use Supplemental Staff • Bring in equally trained staff (burn or critical care nurses, Disaster Medical Assistance Team [DMAT], other health system or Federal sources). • Equally trained staff from administrative positions (nurse managers).	*Substitute*			
• Adjust personnel work schedules (longer but less frequent shifts, etc.) if this will not result in skill / PPE compliance deterioration. • Use family members/lay volunteers to provide basic patient hygiene and feeding – releasing staff for other duties.	*Adapt*			
Focus Staff *Expertise* on Core Clinical Needs • Personnel with specific critical skills (ventilator, burn management) should concentrate on those skills; specify job duties that can be safely performed by other medical professionals. • Have specialty staff oversee larger numbers of less-specialized staff and patients (for example, a critical care nurse oversees the intensive care issues of 9 patients while 3 medical/surgical nurses provide basic nursing care to 3 patients each). • Limit use of laboratory, radiographic, and other studies, to allow staff reassignment and resource conservation. • Reduce availability of non-critical laboratory, radiographic, and other studies.	*Conserve*			
Use Alternative Personnel to Minimize Changes to Standard of Care • Use less trained personnel with appropriate mentoring and just-in-time education (e.g., healthcare trainees or other health care workers, Minnesota Responds Medical Reserve Corps, retirees). • Use less trained personnel to take over portions of skilled staff workload for which they have been trained. • Provide just-in-time training for specific skills. • Cancel most sub-specialty appointments, endoscopies, etc. and divert staff to emergency duties including in-hospital or assisting public health at external clinics/screening/dispensing sites.	*Adapt*			

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NUTRITIONAL SUPPORT

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

RECOMMENDATIONS	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Food • Maintain hospital supply of inexpensive, simple to prepare, long-shelf life foodstuffs as contingency for at least 96 hours without resupply, with additional supplies according to hazard vulnerability analysis (e.g., grains, beans, powdered milk, powdered protein products, pasta, and rice). Access existing or devise new emergency/disaster menu plans. • Maintain hospital supply of at least 30 days of enteral and parenteral nutrition components and consider additional supplies based on institution-specific needs. Review vendor agreements and their contingencies for delivery and production, including alternate vendors. Note: A 30-day supply based on usual use may be significantly shortened by the demand of a disaster.	*Prepare*			
Water • Stock bottled water sufficient for drinking needs for at least 96 hours if feasible (for staff, patients and family/visitors), or assure access to drinking water apart from usual supply. Potential water sources include food and beverage distributors. • Ensure there is a mechanism in place to verify tap water is safe to drink. • Infants: assure adequate stocks of formula and encourage breastfeeding.	*Prepare*			
Staff/Family • Plan to feed additional staff, patients, and family members of staff/patients in select situations (ice storm as an example of a short-term incident, an epidemic as an example of a long-term incident).	*Prepare*			
Planning • Work with stakeholders to encourage home users of enteral and parenteral nutrition to have contingency plans and alternate delivery options. Home users of enteral nutrition typically receive delivery of 30 days supply and home users of parenteral nutrition typically receive a weekly supply. Anticipate receiving supply requests from home users during periods of shortage. Work with vendors regarding their plans for continuity of services and delivery. • Identify alternate sources of food supplies for the facility should prime vendors be unavailable (including restaurants – which may be closed during epidemics). Consider additional food supplies at hospitals that do not have food service management accounts. • Determine if policy on family provision of food to patients is in place, and what modifications might be needed or permitted in a disaster.	*Prepare*			
• Liberalize diets and provide basic nutrients orally, if possible. Total parenteral nutrition (TPN) use should be limited and prioritized for neonatal and critically ill patients.	*Substitute*			
• Non-clinical personnel serve meals and may assist preparation. • Follow or modify current facility guidelines for provision of food/feeding by family members of patients. • Anticipate and have a plan for the receipt of food donations. If donated food is accepted, it should be non-perishable, prepackaged, and in single serving portions.	*Adapt*			
• Collaborate with pharmacy and nutrition services to identify patients appropriate to receive parenteral nutrition support vs. enteral nutrition. Access premixed TPN/PPN solutions from vendor if unable to compound. Refer to Centers for Disease Control (CDC) Fact Sheets and American Society for Parenteral and Enteral Nutrition (ASPEN) Guidelines. Substitute oral supplements for enteral nutrition products if needed.	*Substitute & Adapt*			
• Eliminate or modify special diets temporarily. • Use blenderized food and fluids for enteral feedings rather than enteral nutrition products if shortages occur. Examples: 1. The Oley Foundation: Making Your Own Food for Tube Feeding, http://www.oley.org/lifeline/TubetalkSO07.html#Making%20your%20own 2. Klein, Marsha Dunn, and Suzanne Evans Morris. Homemade Blended Formula Handbook. Tucson: Mealtime Notions LLC, 2007.	*Adapt*			

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MEDICATION ADMINISTRATION

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Cache / Increase Supply Levels • Patients should have at least 30 days supply of home medications and obtain 90 day supply if pandemic, epidemic, or evacuation is imminent. • Examine formulary to determine commonly-used medications and classes that will be in immediate / high demand. • Increase supply levels or cache critical medications - particularly for low-cost items and analgesics. • Key examples include: **Analgesia**: • morphine, other narcotic and non-narcotic (non-steroidals, acetaminophen) class - injectable and oral (narcotic conversion tool at http://www.globalrph.com/narcoticonv.htm) **Sedation**: • particularly benzodiazepine (lorazepam, midazolam, diazepam) injectables **Anti-infective**: • narrow and broad spectrum antibiotics for pneumonia, skin infections, open fractures, sepsis (e.g.: cephalosporins, quinolones, tetracyclines, macrolides, aminoglycosides, clindamycin, etc.), select antivirals **Pulmonary**: • metered dose inhalers (albuterol, inhaled steroids), oral steroids (dexamethasone, prednisone) **Behavioral Health**: • haloperidol, other injectable and oral anti-psychotics, common anti-depressants, anxiolytics **Other**: • sodium bicarbonate, paralytics, induction agents (etomidate, propofol), proparacaine/tetracaine, atropine, pralidoxime, epinephrine, local anesthetics, antiemetics, insulin, common oral anti-hypertensive and diabetes medications	*Prepare*			
Use Equivalent Medications • Obtain medications from alternate supply sources (pharmaceutical representatives, pharmacy caches). **Pulmonary**: • Metered dose inhalers instead of nebulized medications **Analgesia/ Sedation**: • Consider lorazepam for propofol substitution (and other agents in short supply) • ICU analgesia/sedation drips Morphine 4-10mg IV load then 2mg/h and titrate / re-bolus as needed usual 3-20mg/h); lorazepam 2-8mg or midazolam 1-5mg IV load then 2-8mg/h drip	*Substitute*			
Anti-infective: • Examples: cephalosporins, gentamicin, clindamycin substitute for unavailable broad-spectrum antibiotic • Target therapy as soon as possible based upon organism identified. **Other**: • Beta blockers, diuretics, calcium channel blockers, ace inhibitors, anti-depressants, anti-infectives	*Substitute*			
Reduce Use During High Demand • Restrict use of certain classes if limited stocks likely to run out (restrict use of prophylactic / empiric antibiotics after low risk wounds, etc.). • Decrease dose; consider using smaller doses of medications in high demand / likely to run out (reduce doses of medications allowing blood pressure or glucose to run higher to ensure supply of medications adequate for anticipated duration of shortage). • Allow use of personal medications (inhalers, oral medications) in hospital.	*Conserve*			
• Do without - consider impact if medications not taken during shortage (statins, etc.).	*Conserve*			

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MEDICATION ADMINISTRATION

STRATEGIES FOR SCARCE RESOURCE SITUATIONS (cont.)

RECOMMENDATIONS	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Modify Medication Administration • Emphasize oral, nasogastric, subcutaneous routes of medication administration. • Administer medications by gravity drip rather than IV pump if needed: *IV drip rate calculation - drops / minute = amount to be infused x drip set / time (minutes) (drip set = qtts / mL - 60, 10, etc.).* • Rule of 6: pt wgt (kg) x 6 = mg drug to add to 100mL fluid = 1mcg / kg / min for each 1 mL / hour NOTE: For examples, see http://www.dosagehelp.com/iv_rate_drop.html	*Adapt*			
• Consider use of select medications beyond expiration date.* • Consider use of veterinary medications when alternative treatments are not available.*	*Adapt*			
Restrict Allocation of Select Medications • Allocate limited stocks of medications with consideration of regional/state guidance and available epidemiological information (e.g.: anti-viral medications such as olseltamivir)	*Re-Allocate*			
• Allocate limited stock to support other re-allocation decisions (ventilator use, etc.).	*Re-Allocate*			

*Legal protection such as Food and Drug Administration approval or waiver required.

HEMODYNAMIC SUPPORT AND IV FLUIDS

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Cache Additional Intravenous (IV) Cannulas, Tubing, Fluids, Medications, and Administration Supplies	*Prepare*			
Use Scheduled Dosing and Drip Dosing When Possible • Reserve IV pump use for critical medications such as sedatives and hemodynamic support.	*Conserve*			
Minimize Invasive Monitoring • Substitute other assessments (e.g., clinical signs, ultrasound) of central venous pressure (CVP). • When required, assess CVP intermittently via manual methods using bedside saline manometer or transducer moved between multiple patients as needed, or by height of blood column in CVP line held vertically while patient supine.	*Conserve*			
Emphasize Oral Hydration Instead of IV Hydration When Possible Utilize appropriate oral rehydration solution: • Oral rehydration solution: 1 liter water (5 cups) + 1 tsp salt + 8 tsp sugar, add flavor (e.g., ½ cup orange juice, other) as needed. • Rehydration for moderate dehydration 50-100mL / kg over 2-4 hours Pediatric hydration: Pediatric maintenance fluids: • 4 mL/kg/h for first 10kg of body weight (40 mL/h for 1st 10 kg) • 2 mL/kg/h for second 10kg of body weight (20 mL/h for 2nd 10kg = 60 mL/h for 20kg child) • 1 mL/kg/h for each kg over 20kg (example - 40 kg child = 60 mL/h plus 20 mL/h = 80 mL/h) Supplement for each diarrhea or emesis NOTE: Clinical (urine output, etc.) and laboratory (BUN, urine specific gravity) assessments and electrolyte correction are key components of fluid therapy and are not specifically addressed by these recommendations. NOTE: For further information and examples, see http://rehydrate.org, http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5216a1.htm and http://www.ped.med.utah.edu/cai/howto/IntravenousFluidOrders.PDF.	*Substitute*			
Provide Nasogastric Hydration Instead of IV Hydration When Practical • Patients with impediments to oral hydration may be successfully hydrated and maintained with nasogastric (NG) tubes. • For fluid support, 8-12F (pediatric: infant 3.5F, < 2yrs 5F) tubes are better tolerated than standard size tubes.	*Substitute*			
Substitute Epinephrine for Other Vasopressor Agents • For hemodynamically unstable patients who are adequately volume-resuscitated, consider adding 6mg epinephrine (6mL of 1:1000) to 1000mL NS on minidrip tubing and titrate to target blood pressure. • Epinephrine 1:1000 (1mg/mL) multi-dose vials available for drip use.	*Substitute*			
Re-use CVP, NG, and Other Supplies After Appropriate Sterilization / Disinfection • Cleaning for all devices should precede high-level disinfection or sterilization. • High-level disinfection for at least twenty minutes for devices in contact with body surfaces (including mucous membranes);glutaraldehyde, hydrogen peroxide 6%, or bleach (5.25%) diluted 1:20 (2500 ppm) are acceptable solutions. NOTE: chlorine levels reduced if stored in polyethylene containers - double the bleach concentration to compensate). • Sterilize devices in contact with bloodstream (e.g., ethylene oxide sterilization for CVP catheters).	*Re-use*		(disinfection – NG, etc)	(sterilization - central line, etc)

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HEMODYNAMIC SUPPORT AND IV FLUIDS

STRATEGIES FOR SCARCE RESOURCE SITUATIONS (cont.)

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Intraosseous / Subcutaneous (Hypodermoclysis) Replacement Fluids • Consider as an option when alternative routes of fluid administration are impossible/unavailable • Intraosseous before percutaneous Intraosseous • Intraosseous infusion is not generally recommended for hydration purposes, but may be used until alternative routes are available. Intraosseous infusion requires pump or pressure bag. Rate of fluid delivery is often limited by pain of pressure within the marrow cavity. This may be reduced by pre-medication with lidocaine 0.5mg/kg slow IV push. Hypodermoclysis • Cannot correct more than moderate dehydration via this technique. • Many medications cannot be administered subcutaneously. • Common infusion sites: pectoral chest, abdomen, thighs, upper arms. • Common fluids: normal saline (NS), D5NS, D5 1/2 NS (Can add up to 20-40 mEq potassium if needed.) • Insert 21/24 gauge needle into subcutaneous tissue at a 45 degree angle, adjust drip rate to 1-2 mL per minute. (May use 2 sites simultaneously if needed.) • Maximal volume about 3 liters / day; requires site rotation. • Local swelling can be reduced with massage to area. • Hyaluronidase 150 units / liter facilitates fluid absorption but not required; may not decrease occurrence of local edema.	*Substitute*			
Consider Use of Veterinary and Other Alternative Sources for Intravenous Fluids and Administration Sets	*Adapt*			

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MECHANICAL VENTILATION / EXTERNAL OXYGENATION

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Increase Hospital Stocks of Ventilators and Ventilator Circuits, ECMO or bypass circuits	*Prepare*			
Access Alternative Sources for Ventilators / specialized equipment • Obtain specialized equipment from vendors, healthcare partners, regional, state, or Federal stockpiles via usual emergency management processes and provide just-in-time training and quick reference materials for obtained equipment.	*Substitute*			
Decrease Demand for Ventilators • Increase threshold for intubation / ventilation. • Decrease elective procedures that require post-operative intubation. • Decrease elective procedures that utilize anesthesia machines. • Use non-invasive ventilatory support when possible.	*Conserve*			
Re-use Ventilator Circuits • Appropriate cleaning must precede sterilization. • If using gas (ethylene oxide) sterilization, allow full 12 hour aeration cycle to avoid accumulation of toxic byproducts on surface. • Use irradiation or other techniques as appropriate.	*Re-use*			
Use Alternative Respiratory Support Technologies • Use transport ventilators with appropriate alarms - especially for stable patients without complex ventilation requirements. • Use anesthesia machines for mechanical ventilation as appropriate / capable. • Use bi-level (BiPAP) equipment to provide mechanical ventilation. • Consider bag-valve ventilation as temporary measure while awaiting definitive solution / equipment (as appropriate to situation – extremely labor intensive and may consume large amounts of oxygen).	*Adapt*			
Assign Limited Ventilators to Patients Most Likely to Benefit if No Other Options Are Available ***STEP ONE*:** assess patient acuity using SOFA (see next page+) scoring table and/or other parameters appropriate to the situation (agent-specific prognostic indicators, modifications based on agent involved).	*Re-allocate*			

ORGAN SYSTEM	SCORE = 0	1	2	3	4
RESPIRATORY Pa02 / FI02	> 400	≤ 400	≤ 300	≤ 200 with resp. support	≤ 100 with resp. support
HEMATOLOGIC Platelets	> 150	≤ 150	≤ 100	≤ 50	≤ 20
HEPATIC Bilirubin (mg / dl)	< 1.2	1.2 – 1.9	2.0 – 5.9	6 – 11.9	≥ 12
CARDIOVASCULAR Hypotension	None	Mean Arterial Pressure < 70 mmHg	Dopamine ≤ 5 or any Dobutamine	Dopamine > 5 or Epi < 0.1 or Nor-Epi ≤ 0.1	Dopamine > 15 or Epi > 0.1 or Nor-Epi > 0.1
CENTRAL NERVOUS SYSTEM Glasgow Coma Score	15	13 - 14	10 - 12	6 - 9	<6
RENAL Creatinine	<1.2	1.2 - 1.9	2.0 - 3.4	3.5 - 4.9	≥5.0

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MECHANICAL VENTILATION / EXTERNAL OXYGENATION

STRATEGIES FOR SCARCE RESOURCE SITUATIONS (cont.)

RECOMMENDATIONS				***Strategy***	***Crisis***
***STEP TWO*:** Compared to other patient(s) requiring and awaiting external ventilation / oxygenation, does this patient have significant differences in prognosis or resource utilization in one or more categories below that would justify re-allocation of the ventilator / unit? Factors listed in relative order of importance/weight. Injury/epidemiologic factors may have the highest predictive value in some cases and may also affect the predictive ability of the SOFA score.				*Re-allocate*	
Criteria	Patient keeps resource		Resource re-allocated		
1. Organ system function[a]	Low potential for death (SOFA score ≤ 7)	Intermediate potential for death (SOFA score 8-11)	High potential for death (SOFA score ≥12)		
2. Duration of benefit / prognosis	Good prognosis based upon epidemiology of specific disease/ injury. No severe underlying disease.[b]	Indeterminate / intermediate prognosis based upon epidemiology of specific disease / injury Severe underlying disease with poor long-term prognosis and/or ongoing resource demand (e.g., home oxygen dependent, dialysis dependent) and unlikely to survive more than 1-2 years.	Poor prognosis based upon epidemiology of specific disease / injury (e.g., pandemic influenza) Severe underlying disease with poor short-term (e.g., <1 year) prognosis		
3. Duration of need	Short duration – flash pulmonary edema, chest trauma, other conditions anticipating < 3 days on ventilator	Moderate duration – e.g., pneumonia in healthy patient (estimate 3-7 days on ventilator)	Long duration – e.g., ARDS, particularly in setting of preexisting lung disease (estimate > 7 days on ventilator)		
4. Response to mechanical ventilation	Improving ventilatory parameters over time[c]	Stable ventilatory parameters over time	Worsening ventilatory parameters over time		

[a] The Sequential Organ Failure Assessment (SOFA) score is the currently preferred assessment tool but other predictive models may be used depending on the situation / epidemiology. Note: SOFA scores were not designed to forecast mortality, and thus single or a few point difference between patients may not represent a 'substantial difference' in mortality, but larger differences and trends can be extremely helpful in determining resource assignment.

[b] Examples of underlying diseases that predict poor short-term survival include (but are not limited to):

1. Congestive heart failure with ejection fraction < 25% (or persistent ischemia unresponsive to therapy or non-reversible ischemia with pulmonary edema)
2. Severe chronic lung disease including pulmonary fibrosis, cystic fibrosis, obstructive or restrictive diseases requiring continuous home oxygen use prior to onset of acute illness
3. Central nervous system, solid organ, or hematopoietic malignancy with poor prognosis for recovery
4. Cirrhosis with ascites, history of variceal bleeding, fixed coagulopathy or encephalopathy
5. Acute hepatic failure with hyperammonemia

[c] Changes in Oxygenation Index over time may provide comparative data, though of uncertain prognostic significance.
OI = MAWP x FiO2 / PaO2 where: OI = oxygenation index, MAWP= Mean Airway Pressure, FiO2 = inspired oxygen concentration, PaO2 = arterial oxygen pressure (May be estimated from oxygen dissociation curve if blood gas unavailable.)

***STEP THREE*:** Re-allocate ventilator / resource only if patient presenting with respiratory failure has significantly better chance of survival/benefit as compared to patient currently receiving ventilation. Follow additional regional and state/federal guidance and institutional processes for scarce resource situations.

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BLOOD PRODUCTS

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Category	RECOMMENDATIONS	Healthcare Facility	Blood Center	Strategy	Conventional	Contingency	Crisis
All Blood Products	• Increase donations if required, and consider local increase in frozen reserves • Increase O positive levels • Consider maintaining a frozen blood reserve if severe shortage • Increase recruitment for specific product needs		√	*Prepare*			
	• Consider adjustments to donor HGB/HCT eligibility		√	*Adapt*			
	• Relax travel deferrals for possible malaria and BSE (bovine spongiform encephalitis)*		√	*Prepare*			
Packed Red Blood Cells	• Use cell-saver and auto-transfusion to degree possible	√		*Re-use*			
	• Limit O negative use to women of child-bearing age • Use O positive in emergent transfusion in males or non-child bearing females to conserve O negative	√		*Conserve*			
	• Change donations from whole blood to 2x RBC apheresis collection if specific shortage of PRBCs		√	*Adapt*			
	• More aggressive crystalloid resuscitation prior to transfusion in shortage situations (blood substitutes may play future role)	√		*Conserve*			
	• Long-term shortage, collect autologous blood pre-operatively and consider cross-over transfusion	√		*Conserve*			
	• Enforce lower hemoglobin triggers for transfusion (for example, HGB 7)	√		*Conserve*			
	• Consider limiting high-consumption elective surgeries (select cardiac, orthopedic, etc)	√		*Conserve*			
	• Consider use of erythropoietin (EPO) for chronic anemia in appropriate patients	√		*Adapt*			
	• Further limit PRBC use, if needed, to active bleeding states, consider subsequent restrictions including transfusion only for end-organ damage, then to shock states only	√		*Re-allocate*			
	• Consider Minimum Qualifications for Survival (MQS) limits on use of PRBCs (for example, only initiate for patients that will require < 6 units PRBCs and/or consider stopping transfusion when > 6 units utilized). Specific MQS limits should reflect available resources at facility.	√		*Re-allocate*			
	• Reduce or waive usual 56 day inter-donation period* based upon pre-donation hemoglobin		√	*Adapt*			
	• Reduce weight restrictions for 2x RBC apheresis donations according to instruments used and medical director guidance*		√	*Adapt*			
Fresh Frozen Plasma	• Though not true substitute, consider use of fibrinolysis inhibitors or other modalities to reverse coagulopathic states (tranexamic acid, aminocaproic acid, activated coagulation factor use, or other appropriate therapies)	√		*Substitute*			
	• Consider reduction in red cell : FFP ratios in massive transfusion protocols in consultation with blood bank medical staff	√		*Conserve*			
	• No anticipatory use of FFP in hemorrhage without documented coagulopathy	√		*Conserve*			
	• Obtain FDA variance to exceed 24 collections per year for critical types*		√	*Adapt*			

*FDA approval/variance required via American Association of Blood Banks (AABB)

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BLOOD PRODUCTS

STRATEGIES FOR SCARCE RESOURCE SITUATIONS (cont.)

Category	RECOMMENDATIONS	Healthcare Facility	Blood Center	Strategy	Conventional	Contingency	Crisis
Platelets	• Though not true substitute, consider use of desmopressin (DDAVP) to stimulate improved platelet performance in renal and hepatic failure patients	√		*Substitute*			
	• May use leukoreduced whole blood pooled platelets (and, if required, consider non-leukoreduced whole blood pooled platelets)		√	*Adapt*	Leukoreduced		Non-leukoreduced
	• Convert less needed ABO Whole Blood to Apheresis		√	*Adapt*			
	• Transfuse platelets only for active bleeding, further restrict to life-threatening bleeding if required by situation	√		*Conserve*			
	• No prophylactic use of platelets	√		*Conserve*			
	• Accept female platelet donors without HLA antibody screen		√	*Adapt*			
	• Accept female donors for pooled and stored platelets		√	*Adapt*			
	• Apply for variance of 7 day outdate requirement*		√	*Adapt*			
	• Consider a 24 hr hold until the culture is obtained and immediate release for both Pool and Apheresis		√	*Adapt*			
	• Obtain FDA variance to allow new Pool and Store sites to ship across state lines*		√	*Adapt*			
	• Reduce pool sizes to platelets from 3 whole blood donations		√	*Adapt*			

*FDA approval/variance required via American Association of Blood Banks (AABB)

RENAL REPLACEMENT THERAPY
REGIONAL RESOURCE CARD

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Resource cards are intended to provide incident-specific tactics and planning information to supplement the general strategy cards. They are organized according to the 'CO-S-TR' framework of incident response planning – http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8844490&fulltextType=RA&fileId=S193578930000135X

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Command, Control, Communication, Coordination	**General Preparedness Information** Compared to other critical care interventions, hemodialysis offers equipment availability, expansion capacity, and care coordination that greatly reduces the risk of contingency and crisis care, at least in our geographic area. Disaster dialysis challenges generally result from: 1. Lack of clean water sources (each hemodialysis requires about 160 liters ultra-clean water) 2. Relocation of dialysis-dependent patients to a new area (evacuation of nursing homes, flood zones, etc.) 3. Increase in patients requiring dialysis (crush syndrome, unusual infections) Outpatient • Primary providers are DaVita and Fresenius – both have extensive contingency plans to increase capacity and relocate patients (including toll-free numbers to access dialysis services) • Renal Network 11 (multi-state renal planning, quality, and emergency preparedness) has database of all dialysis patients in the state/region and assists coordination activities (http://www.esrdnet11.org/resources/disaster_prep_resources.asp) Inpatient • Most facilities lease inpatient services via contract with above or other agencies; some have own nurses and program – plans should account for contingency use of alternate services / leasing services Patient preparedness • Patients should have a disaster plan – including specific foods set aside for up to 72h. Note that shelters are unlikely to have foods conducive to renal dietary needs (low sodium, etc.) • Personal planning guidance is available at: http://www.kidney.org/atoz/pdf/disaster_prepardness.pdf **Shortage of Renal Replacement Therapy (RRT) Resources** • Affected facility should contact involved/affected dialysis provider companies and organizations as expert consultants[1] (MDH OEP and the Renal Network 11 website maintain contact information)	*Prepare*			
Space	**Relocated Patients Requiring Outpatient Dialysis** • Contact usual outpatient provider network to schedule at new facility – refer patients to 'hotlines' as needed **Excess Patients Requiring Dialysis** • Transfer patients to other facilities capable of providing dialysis • Consider moving patients to facilities with in-house water purification if water quality is an issue for multiple inpatients requiring dialysis	*Substitute*			
	• Consider moving other inpatient or outpatient dialysis staff and equipment to facilities requiring increased dialysis capacity	*Adapt*			

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RENAL REPLACEMENT THERAPY
REGIONAL RESOURCE CARD

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Supplies	**Water Supply** • Quantify water-purifying machines available for bedside dialysis machines • Identify facilities providing high-volume services that purify their own water and pipe to specific rooms in the dialysis unit, intensive care, etc. • Identify water-purifying and dialysis machines to be obtained through lease agreements	*Prepare*			
	Water Contamination • Consider alternate sources of highly purified water	*Prepare*			
	• Consider transferring stable inpatients to outpatient dialysis centers for dialysis treatments and vice versa	*Substitute*			
	• Consider use of MN National Guard water reserves and purification equipment – but must assure adequate purity for dialysis (potable is NOT sufficiently clean)	*Adapt*			
	Power Outage or Shortage • Consider transferring stable inpatients to outpatient dialysis centers for dialysis treatments and vice versa • Consider transferring inpatients to other hospitals • Consider transfer of outpatients to other facilities for care until issue resolved	*Substitute* *Adapt*			
	Dialysis Catheters, Machines, Reverse Osmosis Machines, and/or Other Supply Shortages ***Note:*** Dialysis catheters and tubing are inexpensive, relatively interchangeable, and supplied by several manufacturers				
	• Stock adequate dialysis tubing sets and venous access catheters (Quinton, etc.) for at least one month's usual use • Identify provider network and other sources of supplies and machines	*Prepare*			
	• Transfer machines/supplies between outpatient centers and hospitals, or between hospitals	*Substitute*			
Staff	**Dialysis Staff Shortages**[2] • Non-dialysis nursing staff to take on "routine" elements of dialysis nursing (e.g., taking VS, monitoring respiratory and hemodynamic status, etc.)	*Substitute*			
	• Dialysis nursing staff to supervise non-dialysis nursing staff providing some dialysis functions • Outpatient dialysis techs may be used to supervise dialysis runs if provider deficit is critical issue (would be unlikely aside from potentially in pandemic or other situation affecting staff)	*Adapt*			
Special	**Community Planning** • Medical needs of re-located renal failure patients are substantial; planning on community level should incorporate their medication and dietary needs during evacuation and sheltering activities.	*Prepare*			
Triage	**Insufficient Resources Available For All Patients Requiring Dialysis** • Change dialysis from 'scheduled' to 'as needed' based on clinical and laboratory findings (particularly hyperkalemia and impairment of respiration) – parameters may change based on demand for resources	*Conserve*			
	• Conceivable (but extraordinary, given outpatient dialysis machine resources) situations may occur where resources are insufficient to the point that some patients may not be able to receive dialysis (for example, pandemic when demand nationwide exceeds available resources) – access to dialysis should be considered as part of critical care intervention prioritization (see Mechanical Ventilation Strategies for Scarce Resource Situations)	*Re-allocate*			

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RENAL REPLACEMENT THERAPY
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Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Treatment	**Crush Syndrome** • Initiate IV hydration and acidosis prevention protocols "in the field" for crush injuries to prevent/treat rhabdomyolysis in hospital settings	*Conserve*			
	Mode of Dialysis • Restrict to hemodialysis only for inpatient care (avoid continuous renal replacement therapy(CRRT) and peritoneal dialysis (PD) due to duration of machine use (CRRT) and supply issues (PD))	*Substitute*			
	Increased Demand on Resources • Shorten duration of dialysis for patients that are more likely to tolerate it safely • Patients to utilize their home "kits" of medication (Kayexalate) and follow dietary plans to help increase time between treatments, if necessary	*Conserve*			
Transportation	**Transportation Interruptions** • Dialysis patients may require alternate transportation to assure ongoing access to dialysis treatment. • Chronic patients should coordinate with their service providers / dialysis clinics first for transportation and other assistance during service/transportation interruptions. • Emergency management and/or the health and medical sector may have to supplement contingency transportation to dialysis during ice storms or other interruptions to transportation.	*Prepare* *Adapt*			

[1] The major national dialysis corporations have extensive experience contending with disasters; their input during any anticipated or actual incident is imperative to optimize the best patient care in Minnesota.

[2] See Staffing in the Core Clinical Strategies for Scarce Resource Situations card set.

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BURN TREATMENT
REGIONAL RESOURCE CARD

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

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<table>
<tr><th>Category</th><th>RESOURCE and RECOMMENDATIONS</th><th>Strategy</th><th>Conventional</th><th>Contingency</th><th>Crisis</th></tr>
<tr><td rowspan="1">Command, Control, Communication, Coordination</td><td>

General Preparedness Information

- This cardset is specifically designed to address supplies and needs during the first 24 hours of care

American Burn Association verified burn centers in Minnesota	Referral/Consultation Phone numbers	# Burn Beds
Hennepin County Medical Center (HCMC)	1-800-424-4262	17
Regions Hospital (Regions)	1-800-922-BURN (2876)	18

- Additional capacity and burn expertise may be available at:
  - Essentia Health-Duluth (15 bed burn unit)
  - Mayo Clinic St. Marys Hospital in Rochester (no burn unit)
- Burn casualties must be stabilized at the receiving hospital and then transferred to a burn center. Burn casualties should initially be transported to the highest level of burn/trauma care that is available in the area.
- Metro Regional Hospital Resource Center (RHRC) will coordinate transfers of patients to concentrate as many burn patients at, or close to, burn centers per Metropolitan Cooperative Burn Plan
- Greater Minnesota incident – contact MDH-OEP on-call (via State Duty Officer) if HCMC and Regions are unable to accommodate casualties or if assistance required with transportation/resource issues; affected regional healthcare coalition/Regional Healthcare Preparedness Coordinator will coordinate with MDH and Metro RHRC
- Mass burn incidents are unusual but must be anticipated. The ability of non-burn center hospitals to stabilize successfully and initially treat victims is critical to successful response. All hospitals should plan for incidents considering their relative size and role in the community
- In a mass burn incident, burn consultation resources will be provided. Resource contacts may be outside of Minnesota (e.g., University of Michigan), because HCMC and Regions staff will be occupied with patient care and transfer activities

</td><td>Prepare</td><td></td><td></td><td></td></tr>
<tr><td rowspan="3">Space</td><td>

Space

- Maximal use of burn beds at HCMC, Regions, and Essentia Health-Duluth

</td><td>Adapt</td><td></td><td></td><td rowspan="3"></td></tr>
<tr><td>

- Expand burn units at HCMC and Regions into other ICU spaces at those hospitals

</td><td>Conserve</td><td></td><td></td></tr>
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- Transfer non-burn ICU patients out of HCMC and Regions to other facilities according to Metro Compact, if necessary
- Cohort overflow at institutions close to burn centers (Abbott Northwestern, St. Joseph's, Children's)
- Forward movement to regional burn centers in adjoining states as required to assure appropriate ongoing care in coordination with MDH-OEP and Great Lakes Healthcare Partership (FEMA Region V - MN, WI, IL, IN, MI, OH), and IA and MO burn centers (most burn centers have 6-12 beds each)
- National Disaster Medical System (NDMS) patient movement may be required in massive incidents. In such an event, a burn transfer coordination point will be designated and contact information circulated to hospitals

</td><td>Adapt</td><td></td><td></td></tr>
</table>

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BURN TREATMENT
REGIONAL RESOURCE CARD

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Supplies — Typical Planning Numbers	**Hospital Outpatient Supply Planning**	*Prepare Increase Supply*			

Center Type	Burn Center	Level I & II Trauma Centers	Level III & IV Trauma Centers
Number of Outpatients	100	50	25

Outpatient clinics and urgent care centers may also cache appropriate supplies for their location and patient population.
Suggested supplies per patient for first 72 hours (amounts needed will vary) include:

- 5 - 8 cm x18 cm (3 x 7 inch) sheets petroleum-impregnated gauze (e.g., Adaptic)
- 4 - 10 cm (4 inch) rolls of stretchable roller gauze (e.g., Kerlix); variety of sizes suggested
- 2 - 120 g (4 oz) tube bacitracin
- 30 tablets of ibuprofen 800 mg and stock liquid form for pediatric use
- 50 – opioid analgesic tablets (50 tablets for 5 day supply if 1-2 tablets every 4 to 6 hours); also stock pediatric alternatives
- Assume half of all patients will require tetanus boosters
- Especially in smaller communities, outpatient/pharmacy resources may be limited. Assess and plan for up to 72 hours without re-supply

Adapt

Inpatient Supply Planning

Institutions should prepare based on role in community. In contingency/crisis situation, emphasis moves away from silver-impregnated dressings (expensive to stockpile) to bacitracin/petrolatum-impregnated dressings (e.g. Adaptic). If transfer is possible within the first 24 hours, simple dry sterile sheets or dressings are appropriate - see Burn Triage Card for further information.

Prepare Increase Supply

Adapt

Center Type	Burn Center	Level I & II Trauma Centers	Level III & IV Trauma Centers
Number of Inpatients	50	10	5

Consider stocking, or having plans to obtain supplies sufficient for 2-3 days of care.
Estimated usage of supplies per 24 hours **per patient** is below.

- 15 - 8 cm x 18 cm (3 x 7 inch) sheets petroleum gauze (about 50 % of total body surface area (BSA) normal body mass patient - use as average for major burn patient)
- 2 - bacitracin 120 g (4 oz) tubes (or 1 lb. jar for 2 victims)
- 10 rolls of 10 cm (4 inch) stretchable roller gauze, such as Kerlix
- 2 - 5 cm (2 inch) rolls stretchable roller gauze (e.g., Kerlix) for fingers/toes/small area wrapping - can cut 4 inch in half also
- Morphine (or equivalent) 10 mg/hour x 24 hours = (roughly) 250mg/day/patient
- Massive doses of opioid analgesia and anxiolytics may be required by burn patients (including any patients that are only receiving palliative care)
- 1 tetanus booster per 2 patients
- IV fluid - for example from Parkland formula 4mL/kg x 50% BSA = 14 liters of fluid. Lactated Ringers usually preferred, but saline acceptable
- 1 - central line (including 20% pediatric sizes)

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BURN TREATMENT
REGIONAL RESOURCE CARD

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Staff	**Staff** • Strongly consider pre-incident training on care of major burns for physician and nursing staff; have quick-reference cards/materials available for burn stabilization • Identify staff with prior burn treatment experience (e.g., military) • Plan for just-in-time training for non-burn nursing and physician staff, reinforcing key points of burn patient care (including importance of adequate fluid resuscitation, urine output parameters, principles of analgesia, etc.) • Consider sending burn-trained RN/MD to affected center to assist with triage and initial management if staffing allows. • Burn nurses and physicians provide burn/dressing related care only; other ICU and floor nursing and physician staff provide supportive care. Adjust burn nurse staffing patterns as needed. See *Staffing Strategies for Scarce Resource Situations* sheet for further considerations • Consider just-in-time training on dressing changes, wound care and monitoring – especially at non-burn centers • MDH may work with state and upper Midwest experts to set up a 'hotline' and/or telemedicine or other virtual means by which non-burn centers may easily consult with burn experts • National Disaster Medical System (NDMS) personnel and other supplemental staff may be required	*Prepare* *Adapt* *Adapt* *Conserve* *Adapt* *Substitute*			
Special	**Special Considerations** Consider availability of resources for: • Airway/inhalational injury – extra airway management supplies, bag-valve assemblies, etc. • Pediatric age-appropriate intravenous, intraosseous access devices, medication dosing guides • Consider carbon monoxide or cyanide poisoning if closed space smoke exposure – consult Poison Control Center* • Inhalational exposure – aggressive, early airway management for inhalational injuries • Electrical – high incidence of rhabdomyolysis and internal injuries – increase fluid resuscitation, add bicarbonate to intravenous fluids to alkalinize urine, monitor serum bicarbonate, creatinine, and creatine kinase • Chemical and radiologic – consider need for specific therapies - consult Poison Control Center* • Consider need for decontamination - consult Poison Control Center* • Psychological support for patients, their families and staff. (Do not under-estimate the increased stress and psychological impact of a burn incident, particularly a mass casualty incident, on health care providers.) * Poison Control Center 1-800-222-1222	*Prepare*			

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Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Triage	**Critical Burns – Transfer to Burn Center As Soon As Possible** • See Burn Triage Card • Regardless of the extent of burn involvement, palliation of pain should be considered a priority. If large number of casualties and very severe burns, triage may have to be implemented based on knowledge of percent burn, age and underlying health issues, combined trauma or other conditions (such as severe inhalational injury). Initially, full support should be provided to as many patients as possible. **A triage table may contribute to decisions made by burn surgeons but should NOT substitute for a more global assessment of patient prognosis.** (Saffle JR, Gibran N, Jordan M. Defining the ratio of outcomes to resources for triage of burn patients in mass casualties. J Burn Care Rehabil. 2005;26:478-482)	*Conserve* *Re-Allocate*			

Age (yrs)	Burn Size (% total body surface area)									
	0-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91%+
0-1.9	Very high	Very high	Very high	High	Medium	Medium	Medium	Low	Low	Low/ Expectant
2.0-4.9	Outpatient	Very high	Very high	High	High	High	Medium	Medium	Low	Low
5.0-19.9	Outpatient	Very high	Very high	High	High	High	Medium	Medium	Medium	Low
20.0-29.9	Outpatient	Very high	Very high	High	High	Medium	Medium	Medium	Low	Low
30.0-39.9	Outpatient	Very high	Very high	High	Medium	Medium	Medium	Medium	Low	Low
40.0-49.9	Outpatient	Very high	Very high	Medium	Medium	Medium	Medium	Low	Low	Low
50.0-59.9	Outpatient	Very high	Very high	Medium	Medium	Medium	Low	Low	Low/ Expectant	Low/ Expectant
60.0-69.9	Very high	Very high	Medium	Medium	Low	Low	Low	Low/ Expectant	Low/ Expectant	Low/ Expectant
70.0+	Very high	Medium	Medium	Low	Low	Low/ Expectant	Expectant	Expectant	Expectant	Expectant

Outpatient: Survival and good outcome expected, without requiring initial admission; **Very High:** Survival and good outcome expected with limited/short-term initial admission and resource allocation (straightforward resuscitation, LOS <14-21 days, 1-2 surgical procedures); **High:** Survival and good outcome expected (survival ≥ 90%) with aggressive and comprehensive resource allocation, including aggressive fluid resuscitation, admission ≥14-21 days, multiple surgeries, prolonged rehabilitation; **Medium:** Survival 50-90% and/or aggressive care and comprehensive resource allocation required, including aggressive resuscitation, initial admission ≥14-21 days, multiple surgeries and prolonged rehabilitation; **Low:** Survival <50% even with long-term aggressive treatment and resource allocation; **Expectant:** Predicted survival ≤10% even with unlimited aggressive treatment.

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BURN TREATMENT
REGIONAL RESOURCE CARD

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Treatment	**Treatment** Provide stabilizing burn care (airway, fluid management, analgesia, etc. – see Burn Triage Card with initial priorities, wound care, and nursing care). After stabilizing care, assess need for transfer to burn center. In a mass burn incident, assure coordination with Regional Hospital Resource Center, which will help to prioritize transportation and manage logistics. Patients may have to be held for 1-2 days at non-burn centers awaiting transfer in some cases.	*Adapt*			
Transport	**Transport** • Initial dressings should be dry, sterile dressing if transfer planned. If transfer will be delayed, adaptic dressings may be applied in consultation with burn center. • In consultation with burn specialist, arrange air medical transport or ground transport as appropriate. If multiple institutions are affected, coordinate with Regional Hospital Resource Center/Regional Healthcare Preparedness Coordinators • Obtain consultation with burn experts for ongoing care and triage/transportation prioritization if immediate transportation/referral is not possible • Plan for oxygen, fluids, and analgesia requirements during transport • Consider need for airway intervention prior to transport • Multi-agency coordination center may be used to help prioritize use of transportation assets • Consider use of Metro Mass Casualty Incident (MCI) buses for large numbers of patients being transferred (contact MDH-OEP on-call via State Duty Officer) • Regional transfer may be required – Metro Regional Healthcare Resource Center will coordinate this with MDH-OEP and appropriate state and Federal (NDMS) resources	*Prepare* *Adapt*			

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BURN TRIAGE CARD

Patient Arrives / Initial Assessment

High risk features? *

- Partial thickness burns > 10% total body surface area (BSA)
- Burns that involve the face, hands, feet, genital area or joints
- Third degree burns
- Electrical burns, including lightning injury
- Chemical burns
- Inhalation injury
- Any patient with burns and concomitant trauma

* Consultation/special consideration recommended for elderly, children <5 years, underlying diseases such as diabetes, or special rehabilitation needs

Yes

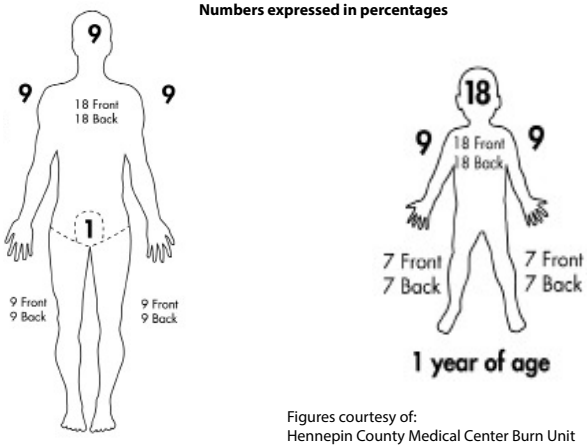
No

Minor

- Consider outpatient management, consultation/referral to wound/burn clinic or burn center as required
- Burn care outpatient supplies see Burn Treatment Regional Resource Card

Rule of Nines

Numbers expressed in percentages



Figures courtesy of:
Hennepin County Medical Center Burn Unit

American Burn Association Burn Centers in Minnesota	
Hennepin County Medical Center	1-800-424-4262
Regions Hospital	1-800-922-BURN (2876)

Initial Interventions:

Airway/Breathing – Assess airway and provide oxygen. Consider early intubation for >25% BSA burns. Intubation recommended: stridor, voice change, respiratory distress, circumferential neck burns, carbonaceous sputum, hypoxia, or prolonged transport time and major burn patient

Circulation - Assess vital signs and pulses. Burn shock common >20% BSA. Treat low blood pressure with IV fluids; consider other sources of hypotension. Avoid boluses when possible - increase fluid rates by 10% per hour for low urine output or lower blood pressures

Disability – Assess neurologic status (including sensation and motor); cervical spine protection if trauma/high-voltage (>1000 V) injury

Decontamination – Consider potential for chemical/radiologic contamination. Chemical burns should be irrigated for 30 minutes with body temperature water while consulting Poison Control* about specific treatments

Expose/Estimate - Remove clothing, jewelry, and contact lenses. Protect from hypothermia. Estimate second/third degree burn area (see figures below). Area of patient's hand (including fingers) equals 1% BSA

Fluids - IV access in non-burned tissue if possible. Start Lactated Ringers (LR) 4 mL/kg/% BSA. Give 50% over first 8 hours and rest over 16 hours from time of burn. Children <5 years add 2 ampules D50 to each liter of LR. May use normal saline if no LR available

History – Note time of injury, mechanism, AMPLET (Allergies, Medications, Past surgical and medical history, Last meal, Events surrounding the incident, Tetanus status)

Nasogastric or Orogastric - Insert tube for all intubated patients

Pain Control – Administer analgesia; extraordinary doses may be required to control pain adequately

Urine Output – All electrocutions, intubated patients, and major burns should have indwelling urinary catheter (e.g., Foley). Goal is 0.5mL/kg/hr output adults, 1mL/kg/hr children

Wound Care – Do not remove adherent clothing. Warm, dry dressings over burns - NO wet dressings

Special Considerations:

- Closed space exposure assume carbon monoxide and/or cyanide toxicity - provide 100% oxygen*
- High-voltage electrical – assume rhabdomyolysis and assess for internal injuries. Normal saline resuscitation untl clear urine output 1-2 mL/kg/hr. Monitor creatine kinase, serum bicarbonate and creatinine. Consult with burn/referral center for ongoing management

*Consult Minnesota Regional Poison Control Center at 1-800-222-1222.

Secondary Assessment – Critical Burn Features?

- >20% BSA second and/or third degree burns
- Intubated patient, inhalational injury, or prolonged closed-space smoke exposure
- Co-existing major trauma, rhabdomyolysis, or other complications
- Hemodynamic instability not responding to fluid resuscitation

Yes

No

High Priority For Transfer To Burn Center

- Continue fluid resuscitation and analgesia
- Escharotomies may be required to allow ventilation of patients with circumferential neck, chest or abdominal burns
- Arrange transfer and consultation
- Some patients in this category may be triaged to receive only palliative care (until/unless additional resources become available)

Secondary Priority For Transfer

- May have to manage in place awaiting transfer (24-48 hours)
- Obtain consultation from burn center - MDH may organize hotline/alternative resources during mass casualty incidents
- Cover burns with clean dry linens - no immediate dressings are necessary if transferred in the first 24 hours - after 24 hours consider bacitracin dressings per burn consultation
- Monitor urine output and provide IV fluids to maintain parameters as above
- Infection control – providers should gown, glove, and mask
- Follow cardiorespiratory and renal function
- Maintain body temperature
- Consider early use of enteral/tube feedings if oral intake inadequate
- Analgesia
- Circulation, Motor and Sensory function (CMS) checks
- Evaluate for other injuries

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PEDIATRICS
REGIONAL RESOURCE CARD

Resource cards are intended to provide incident-specific tactics and planning information to supplement the general strategy cards. They are organized according to the 'CO-S-TR' framework of incident response planning – http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8844490&fulltextType=RA&fileId=S193578930000135X

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis

Command, Control, Communication, Coordination	**Planning and response considerations:**
	Tertiary centers with inpatient pediatric, trauma and PICU capability can provide consultation and transfer support based on patient needs. The following centers can provide real-time consultation in support of pediatric critical care when transfer is difficult or not possible or when highly specialized services (e.g. ECMO) are anticipated to be needed.
	• Pediatric hospital resources in Minnesota:
	  • Level I Pediatric Trauma Centers – Hennepin County Medical Center, Mayo Clinic Eugenio Litta Children's Hospital, Gillette Children's/Regions Hospital, Children's Hospitals and Clinics of Minnesota
	  • University of Minnesota Amplatz Children's Hospital
	  • St. Mary's Children's Hospital Duluth (Essentia)
	  • Other tertiary centers with inpatient pediatric and PICU capability
	• Pediatric patients will have to be stabilized (and in some cases treated, for 24 to 48 hours) at initial receiving hospital in major incident – all facilities must be prepared for pediatric cases
	• Facility procedures for patient tracking, unaccompanied minors, and release of minors to family/caregivers
	• Smaller incidents – facility-to-facility coordination
	• Metro - Regional Hospital Resource Center (RHRC) will coordinate transfers of patients to concentrate as many pediatric patients as possible at, or close to, pediatric centers per Metropolitan Cooperative Pediatric Plan (concentrate those less than 5 years of age and critically ill at children's hospitals)
	• Statewide incident impact
	  • MDH will work with Regional Healthcare Preparedness Coordinators (RHPCs) and hospitals/healthcare coalitions to facilitate patient and resource distribution
	  • Statewide consultation/referral hotline may be initiated as needed
		Prepare			

Space	**Space:** • Use maximal beds on pediatric unit and at pediatric centers noted above • Prioritize transfer of children < 8 years of age to pediatric specialty centers • Surge to non-pediatric, age-appropriate units within hospital • Distribute non-critical and older pediatric patients from overwhelmed pediatric centers to other accepting facilities • Expand acute outpatient care for the minimally injured/ill • Forward movement to regional pediatric centers in adjoining states as required to assure appropriate ongoing care – in coordination with MDH-OEP and Great Lakes Healthcare Partnership (FEMA V – MN, WI, IL, IN, OH, MI and city of Chicago) and/or National Disaster Medical System (NDMS) patient movement for catastrophic incident (unlikely to only affect pediatric portion of population)	*Adapt* *Conserve* *Substitute*			

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PEDIATRICS
REGIONAL RESOURCE CARD

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

<table>
<tr><th>Category</th><th>RESOURCE and RECOMMENDATIONS</th><th>Strategy</th><th>Conventional</th><th>Contingency</th><th>Crisis</th></tr>
<tr><td rowspan="2">Supplies</td><td>

Outpatient Supply Planning:

- Consider expansion of outpatient pediatric-specific supplies (e.g., crutches, pediatric-specific forms of analgesics) at facility to support discharged patients

Inpatient Supply Planning:

- Institutions should prepare based on role in community
- As a minimum, recommend each facility be prepared to care for the number of victims listed in the table below, based on their designated trauma level in the MN Trauma System.

<table>
<tr><th rowspan="2">Inpatient Type</th><th colspan="4">Minnesota State Trauma Designation</th></tr>
<tr><th>Level I</th><th>Level II</th><th>Level III</th><th>Level IV</th></tr>
<tr><td>Critical Injuries < age 8 yrs</td><td>8</td><td>6</td><td>4</td><td>2</td></tr>
<tr><td>Moderate Injuries < age 18 yrs</td><td>20</td><td>15</td><td>10</td><td>5</td></tr>
<tr><td>Minor Injuries < age 18 yrs</td><td>20</td><td>15</td><td>10</td><td>5</td></tr>
<tr><td>Infants < age 1 yr</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
</table>

</td><td rowspan="2">Prepare</td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>

The American Academy of Pediatrics/American College of Emergency Physicians recommended equipment list at http://pediatrics.aappublications.org/content/107/4/777.full.pdf+html is the basis for planning, with emphasis on:

- Airway equipment sufficient for number and age of victims
- Vascular access equipment, including adequate quantity of intravenous cannulas and intraosseous needles
- References, charts, or other systems for size/weight-based equipment and drug dosing (reference book, wall charts, Broselow tape, or similar)
- External warming devices (such as Bair-hugger™)
- State trauma system guidelines also identify pediatric equipment expectations

</td></tr>
</table>

PEDIATRICS
REGIONAL RESOURCE CARD

MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Staff	**Staff:** • Pre-incident pediatric medical/trauma critical care training should be conducted for physician and nursing staff expected to provide emergency care. Consider courses such as Advanced Pediatric Life Support, Pediatric Advanced Life Support • Staff that do not regularly provide pediatric emergency care but could be called upon in a disaster should receive pre-incident training and orientation to facility equipment. Scenario-based or other training (simulation and other brief, frequent training) is highly recommended • Just-in-time training may be required in certain situations for non-pediatric nursing and physician staff reinforcing key points of pediatric or incident-specific patient care (including pediatric assessment triage, importance of fluid management, urine output parameters, principles of analgesia, etc) • In a major incident, adjust pediatric physician and nurse staffing patterns as needed to provide supervision of key aspects of pediatric care. See *Staffing Strategies for Scarce Resource Situations* for further consideration; for example, have critical care staff supervise care at a higher level, delegating many bedside duties to other providers • MDH may work with in-state and adjacent state experts to set up 'hotline' to provide consultation to non-pediatric centers caring for pediatric patients (for example during pandemic) • National Disaster Medical System and/or other supplemental staff may be required to work in facilities (see *Staffing Strategies for Scarce Resource Situations*)	*Prepare* *Adapt* *Conserve* *Adapt* *Substitute*			
Special	**Consider availability of resources for:** • Social work/ family support • Psychological support for children, their families and staff (do not under-estimate the increased stress and psychological impact of a pediatric incident, particularly a mass casualty incident, on healthcare providers) • Discharge support and planning, particularly for rehabilitation and other specialty follow-up • Patient tracking and patient safety, particularly for unaccompanied minors (e.g. banding system to identify children and guardians) • Family / caregiver accommodations	*Prepare*			
Triage	**Consider early transfer to a facility providing pediatric intensive care services for:** • Progressing respiratory symptoms/hypoxia • Shock, or need for ongoing resuscitation • Critical trauma, including neurotrauma according to usual trauma triage criteria • Patients with concomitant burns should be transferred to Regions Hospital or Hennepin County Medical Center • Patients with complex underlying medical conditions may require consultation or special triage considerations	*Conserve*			

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Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Treatment	**Provide stabilizing care (airway, fluid management, analgesia, etc.) – see Pediatric Triage Card for initial priorities** **Special Considerations:** • Airway/Breathing and Circulation (ABCs) are still critical – do not deviate from usual trauma/critical care priorities due to size/age/behavior concerns • Pediatric airways are small; there is little room between partial and complete obstruction • Age and height-based estimations are NOT always accurate – always be prepared with a range of equipment sizes, especially for airway interventions • Assess skin color, capillary refill and heart rate for signs of poor perfusion. Hypotension is a late sign of shock in pediatric patients • Typically, pediatric patients respond to treatments more quickly than adults. Reassess them frequently and alter treatments to fit the response • Monitor for signs of pain and treat pediatric patients with analgesics via weight-based guidelines, then titrate to effect. Pediatric pain is often inadequately treated • Hypoglycemia and hypothermia are very common –anticipate, prevent, and correct as necessary • Monitor IV fluids carefully to control volume delivered in smaller patients (e.g., IV pumps or buretrols) • Double-check medication doses with team members, especially with medication drips as significant errors are common. DO NOT exceed maximum adult dose • Assessment may be difficult due to age-related and communication-related issues – history from the family/caregivers may be critical • Do not separate the child from family/guardian if at all possible • Medical alert bracelets and care plans should be sought for all children	*Prepare*			
Transportation	**After stabilizing care, assess need for transfer:** • Plan for oxygen, fluids, and analgesia requirements in transport • Consider need for airway intervention prior to transport • Consider plans for caregivers/family transportation • A mass casualty incident may affect more than one facility requiring coordination with regional healthcare coalitions to prioritize transportation and manage logistics via Multi-Agency Coordination • Regional transfer coordination may be required in major disasters – MDH Office of Emergency Preparedness will assist regional healthcare coalitions and involve appropriate State and Federal (NDMS) resources; in certain situations (such as pandemic, major mass casualty incident) patients may have to receive care in non-pediatric centers • Ensure that targeted medical record information (including name, allergies, medications given, current medications, age and family contact information) is always with patient • Arrange transport via air medical transport as appropriate – if multiple institutions affected coordinate with regional healthcare coalition and/or multi-agency coordination system	*Prepare* *Adapt*			

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PEDIATRIC TRIAGE CARD For Mass Casualty Situations

Patient Arrives / Initial Assessment

High Risk Features? *

- Hypoxia or respiratory distress
- Multiple injuries or high-energy mechanism
- Signs of hypoperfusion / shock (may be isolated to tachycardia)
- Altered mental status

* Consultation may be warranted for age <5 years, or underlying complex illness/disease (congenital abnormality, etc.)

Yes →

No ↓

Minor:

- Assessment, treatment and observation
- Address psychosocial needs; re-unify with family; support as needed
- Discharge, if able, to secure environment if parent/guardian not accompanying

Initial interventions:

Airway – Assess and position airway; airway interventions as needed. Children < 5 years have small airways that do not tolerate edema well. Reassess frequently

Breathing – Assess for evidence of respiratory distress (retractions, hypoxia, grunting). Provide oxygen, bronchodilators (e.g., albuterol, epinephrine) and other interventions as needed

Circulation – Assess for signs of hypoperfusion including capillary refill, vital signs, pulses, etc. Fall in blood pressure is late and end-stage. Treat signs of hypoperfusion aggressively with 20 mL/kg normal saline (and 10 mL/kg packed red blood cells if hemorrhagic shock persists after initial boluses of saline), see Fluid Management below

Disability – Assess neurologic status (including sensation and motor) and need for cervical spine protection

Decontamination – Consider for chemical/radiologic – brush away loose material, then copious water. Consult Poison Control Center at 1-800-222-1222

Expose - Remove clothing, jewelry and, if mental status altered, contact lenses. Protect from heat loss; hypothermia is common

Fluids – IV fluids (see Fluid Management below)

Family – Avoid separating family/guardians from patients. Identify and notify patient's family/guardians of patient's status when possible

Glucose – Check fingerstick glucose for all significantly ill/injured children. Correct hypoglycemia

History – Note mechanism and time of injury, treatments pre-hospital, underlying diseases, tetanus status, medications/allergies, social history, family history, immunization history

Orogastric – Tube for all intubated patients (due to usual gastric distension)

Pain control – Titrated opioid analgesia, IV, intranasal, or subcutaneous as required for comfort (e.g., morphine 0.1 mg/kg or fentanyl 1 mcg/kg IV)

Temperature/Thermal – Protect from heat losses; initiate cooling/rewarming or anti-pyresis as indicated. Children lose body heat rapidly

Urine output– Target urine output to 0.5 - 1 ml/kg/hour. Indwelling urinary cathether as needed

↓

Secondary Assessment – Critical illness/injury?

- Intubated or progressive respiratory failure
- Multiple organ systems affected
- Surgical emergency
- Evidence of shock (poor perfusion, high lactate, persistent tachycardia) not responding to fluid resuscitation

Yes →

High Priority for Transfer to Pediatric Center

- Continue fluid resuscitation
- Arrange transfer and consultation
- May have to provide transfers, triage resources, or even provide palliative care as only intervention based on scope of injury/nature of incident. Re-triage as more resources become available or condition changes.

No ↓

Secondary Priority for Transfer

- May have to manage in place awaiting transfer (24-48 hours) (e.g. isolated orthopedic injuries)
- Obtain consultation from pediatric referral center (during mass casualty incident MDH may organize hotline)
- Diagnostic studies as indicated (minimize ionizing radiation without omitting necessary studies)
- Monitor urine output and provide IV fluids (see Fluid Management)
- Infection control – providers should gown, glove and mask as appropriate for illness/injury
- Follow cardiorespiratory and renal function, Circulation, Motor and Sensory function (CMS) and glucose checks at regular intervals
- Maintain body temperature
- Analgesia
- Psychological triage and support/family support

Fluid Management

- Initial fluid for resuscitation – normal saline
  - Initial bolus 20 mL/kg, repeat as needed
  - May initiate packed red blood cells 10 mL/kg if hemorrhage not responding to 40 mL/kg saline total bolus
- Maintenance fluid rate
  - 4 mL/kg/hr first 10 kg (40 mL/hr)
  - 2 mL/kg/hr second 10kg (20+40 = 60 mL/hr)
  - 1 mL/kg/hr each kg >20 kg
- Glucose replacement IV/IO
  - Neonate D10W 3 mL/kg
  - Under 4 years D25W 2mL/kg
  - ≥ 4 years D50W 1 mL/kg
- Goals – normal vital signs, urine output 0.5-1 mL/kg/hr

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Resource list of pediatric emergency equipment:
http://pediatrics.aappublications.org/content/107/4/777.full.html

For pediatric planning, response poster and materials, refer to MDH Pediatric Primer:
http://www.health.state.mn.us/oep/healthcare/pedsprimer.docx

Version 4.0 December 2013

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PALLIATIVE CARE
REGIONAL RESOURCE CARD

Resource cards are intended to provide incident-specific tactics and planning information to supplement the general strategy cards. They are organized according to the 'CO-S-TR' framework of incident response planning – http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8844490&fulltextType=RA&fileId=S193578930000135X

Orientation to Specialty and Goals:

NOTE:
This card provides a focused description of palliative care management principles in disaster situations. These principles are relevant to all patients, as well as those who may receive palliative care as their only intervention due to demand on the healthcare system relative to their prognosis.

Specialty Description:
Palliative care has a goal of providing the best possible quality of life for people facing the pain and stress of a serious, but not necessarily terminal, medical condition. It can be appropriate for patients of any age and at any stage of an illness - from diagnosis on - and can be provided along with treatments for the medical condition.

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Supplies	Page 11-4	Treatment	Pages 11-7 & 11-8		

Principles of Palliative Care:

- **Palliative care should be provided to ALL patients.**
- In a subset of patients, it may be the only care that is able to be provided due to the patient's prognosis and available resources
- Focuses on human contact and comfort in addition to medical care
- Increases the physical and mental well-being of the patient
- Is not abandonment or euthanasia, and does not aim to hasten death (though in some cases, the doses required to relieve severe symptoms may indirectly contribute to the dying process; however, this meets the ethical criteria for the double-effect principle where indirect harm is permissible in the service of a greater good)
- Relieves symptoms and provides physical comfort measures such as control of pain, nausea, dyspnea, temperature regulation, and positioning
- Assures respectful care, reassurance, and emotional and social support as possible

Disaster Considerations:

- Symptom support should be maintained in hospital and non-hospital environments – this will involve planning by outpatient entities such as hospice care, pharmacies, medical equipment providers as well as inpatient entities such as palliative care programs
- For existing hospice patients, the spectrum of care should be defined
- For those designated to receive only palliative care key considerations are:
  - ◊ Expected survival - hours, days, or weeks – this helps to guide needs, referrals, and resources
  - ◊ Required interventions – this helps guide location of care and support planning
  - ◊ Basis for designation – if the decision for palliative care is based on the lack of a single resource, there must be a plan for re-assessment if the patient's condition improves or more resources become available (i.e., would they qualify to receive additional treatment if more resources become available and how are they contacted/monitored) - see triage tree below
- Home health and other agencies will need to prioritize services relative to hospice patients during a disaster (as this can have significant impact on patient/family/agency planning)
- Supportive measures should be offered that maintain comfort, but do not prolong the dying process
  - ◊ If death is inevitable, there may be no point in providing intravenous fluids
  - ◊ **If death is not certain, other forms of support may be very reasonable as other resources become available**

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PALLIATIVE CARE
REGIONAL RESOURCE CARD

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis

Planning Resources	**Planning Resources:**
	• General palliative care resources and fact sheets
	  • End of Life/Palliative Education Resource Center (EPERC) - Medical College of Wisconsin http://www.eperc.mcw.edu/EPERC/FastFactsandConcepts
	• General recommendations for home care/family based care and infectious prevention
	  • Home Care Guide: Providing Care at Home http://www.minneapolismn.gov/www/groups/public/@health/documents/webcontent/wcms1p-088274.pdf
	• ICU care
	  • Improving Palliative Care in the ICU (IPAL-ICU project) http://www.capc.org/ipal-icu
	• General resources in palliative care and non-pharmacologic intervention
	  • Innovations in End-of-Life Care: Practical Strategies and International Perspectives http://www2.edc.org/lastacts/ http://www2.edc.org/lastacts/archives/archivesJuly02/nonpharm.pdf
		Prepare			

Planning / Communications and Coordination	**Key Minnesota Organizations:** • Minnesota Network of Hospice & Palliative Care (www.mnhpc.org) • Inpatient palliative care programs: Palliative care MD on 24 hour pager for most facilities/systems • Hospice programs: Majority of State has hospice program coverage and most programs usually have hospice MD on 24 hour pager - check with hospital health systems main contact/referral phone line	*Prepare*			

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Communications and Coordination	**Communications and Coordination:** • Close coordination between hospitals, home care agencies, and public health is required prior to and during disasters in which increased home care and at-home palliative and hospice services are expected • Communications, including printed materials and a mechanism for ongoing situational awareness, are required during contingency and crisis events – this may involve conference calls or other means of keeping stakeholder agencies informed and up-to-date • In major disasters requiring proactive triage to palliative care only, MDH may provide additional guidance and incident-specific resources, which may include a hotline for advice and consultation about palliative care issues. Additional resources for families providing home care would also need to be made available by local and state public health and major healthcare systems **Communications with Families and Patients:** • Review advance care planning in the context of the current situation – proxy designations, advance directives, Physician Orders for Life-Sustaining Treatment (POLST) forms, http://www.mnmed.org/KeyIssues/POLSTCommunications/tabid/3291/Default.aspx. • Interventions able to be offered may not fulfill all of the preferences expressed in those directives http://www.health.state.mn.us/divs/fpc/profinfo/advdir.htm • Describe palliative support as a quality of life and aggressive symptom management framework that is not related to hastening death or euthanasia • Incorporate relevant cultural variables into palliative care plans • Proactively provide families and patients with up-to-date information on the resources in shortage and any relevant triage criteria/processes being used, as well as any necessary infection prevention measures • Explain the basis of triage decisions and any re-assessment or potential options. Re-frame goals of care with patient and family • Maintain hope despite changes in treatment/goals - factors that often decrease hope include feeling devalued, abandoned or isolated (“there is nothing more that can be done”), lack of direction and goals, and unrelieved pain and discomfort	*Prepare* *Adapt*			

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PALLIATIVE CARE
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Space	**Inpatient Space:** In crisis situations there may be a large number of patients that are receiving palliative care only – cohorted spaces may be an option for these patients. These areas should be: • Comfortable – the maximal physical comfort should be provided to patients and families and the environment and equipment should be as comfortable as possible given the resources available • Private – as much privacy as possible should be planned for the patients and families	*Adapt*			
	Outpatient Space: Facilities should have plans in place with home healthcare agencies as well as plans for family provision of palliative care. This may include: • Home care/hospice agencies should prioritize services to those with the most limited support or more intensive support needs during a disaster (e.g., prioritize services to those requiring intravenous fluids or medications, oxygen, or other high-intensity therapies - if these can be maintained during the disaster) • Phone banks and other indirect support services for families and patients	*Conserve* *Adapt*			
	Transitions: • When inpatients are receiving palliative care as their only treatment, they must be cared for in a space appropriate to their remaining life expectancy (i.e., patients with hours to live would not be moved, and patients with days or weeks remaining would be moved to another inpatient area or to home/outpatient care) • Access to pre-printed information for families guiding them in the provision of comfort care including: ◊ Analgesia and other medication dosing per physician or other instructions ◊ General information about prevention of decubitus ulcers and maintenance of comfort ◊ The dying process, what to expect, and what to plan for ◊ Resources that the family can use in case of questions or problems • Assure that appropriate infection prevention precautions are accounted for (e.g. droplet precautions)	*Substitute* *Adapt* *Conserve*			
Supplies	**Supplies:** There is no substitute for pre-event stockpiling of medications to treat key symptoms. *Every* disaster will require significant quantities of analgesics. The availability of adequate pain and symptom relief should be a key area of disaster planning.	*Prepare*			
	Inpatient and Outpatient: Anticipate the need for additional stocks of medications to provide analgesia and symptom relief for all patients. Inexpensive but critical medications to stockpile include: • Oral non-opioid analgesics (also valuable as anti-pyretics) • Opioid analgesics • Benzodiazepines • Anti-psychotics • Anti-emetics • Steroids • Diuretics Outpatient pharmacies should anticipate the need for increased supplies of these agents and support palliative care dosing of these agents that may be in excess of usual recommendations. • Avoid stockpiling or hoarding in the setting of increased demand.	*Adapt*			

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PALLIATIVE CARE
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Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Staff	**Staff:** • Physician and nursing staff expected to provide disaster palliative care should receive pre-incident palliative care training • Staff that do not regularly provide palliative care, but could be called upon in a disaster, should receive pre-incident training and orientation to facility resources • The facility should identify subject matter experts within their facility/area and obtain their input into palliative care planning. During a response, these experts can provide input on strategies and tactics, as well as provide overall clinical guidance and expertise	*Prepare*			
	• Faith-based and other community resources for non-clinical support may be critical assets for those receiving care at home • Spiritual resources should be made available to both patient and family if desired and feasible • Just-in-time training should be provided to nursing and physician staff as required to acquaint them with palliative care priorities, medication dosing, and other issues	*Conserve* *Adapt* *Substitute*			
	• Hospice agencies should have plans to adjust staff roles and triage services provided in response to increased demand • In case palliative care areas are activated, support these areas with staff that are comfortable with medication administration that can be supervised by staff with more experience. Precise recommendations on staffing are difficult as the needs of the patients can vary greatly, but every attempt should be made to provide adequate personnel to meet the comfort needs of patients – this may involve tiered use of professional and non-professional staff • Additional staff may have to be drawn from other institutions or fields, or from the Medical Reserve Corps (e.g., to provide broader support to homecare). These staff will also require just-in-time training • Regionally, palliative care teams that can support a facility in crisis or support additional outpatient care may be advantageous	*Conserve* *Adapt* *Substitute*			

Special	**Special:**
	When triage to 'palliative care only' in disasters is not by patient choice, management of expectations and transitions is critical to the physical and mental well-being of patient, family, and providers.
	• Consider availability of resources for:
	  • Social work/family resources
	  • Spiritual support
	  • Psychological support for patients and their families
	  • Discharge and/or death support and planning
	  • Family/caregiver accommodations
	  • Psychological support for staff
		Prepare			

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PALLIATIVE CARE
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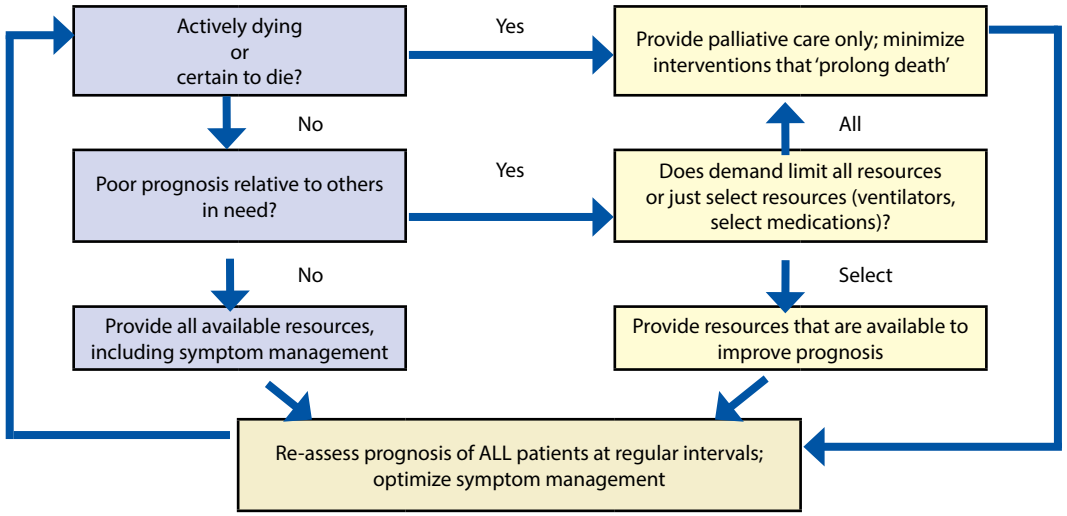
Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Triage	**Triage:** • The need for palliative care should be anticipated in all disaster scenarios • Triage decisions may be required in minutes (multiple burn victims), over hours (many trauma victims), or over days or weeks (pandemic) • When it is clear that the volume of patients and current level of resources will require prioritizing some patients to palliative care only, triage criteria should be developed whenever possible and a formal triage team put in place (proactive measures may not be possible in the early phase of an incident, but should be implemented as soon as possible) • Location for palliative care should be optimized given the constraints of the incident – patients may be triaged to home, to other facilities, to inpatient units, or to other locations • Triage is dynamic. As resources allow, it is critical to re-triage patients so that they may receive resources that have become available. Predicted prognosis does not equate with actual outcome in many cases. (See triage tree below) **Triage Tree - Resource-dependent palliative care considerations**  	*Conserve* *Re-allocate* *Adapt*			

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PALLIATIVE CARE
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MINNESOTA HEALTHCARE SYSTEM PREPAREDNESS PROGRAM

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Treatment	**Treatment:** **Provide Symptomatic Management:** • Do not under-estimate the psychological impact on patients, caregivers and family of these situations. All of these persons may require medical and non-medical treatment for anxiety, grief, complicated grief, post-traumatic stress disorder and mental health issues due to the stress of these events • Treatment with appropriate doses of medication is important – see the opiate dosing references below as an example, but after initial doses, titrate to appropriate symptom relief as required, rather than to any specific recommended dose of medication • Adapt with the medications and resources that are available • Web resource for treatment: Medical College of Wisconsin End of Life / Palliative Educational Resource Center (EPERC) - http://www.eperc.mcw.edu/EPERC/FastFactsandConcepts **General Pain Management:** • 'WHO ladder' for pain relief ◊ For mild pain (unless contraindicated) use aspirin, acetaminophen or nonsteroidal anti-inflammatory agents ◊ If pain persists (mild to moderate) add oxycodone, hydrocodone, or similar oral opioids ◊ If pain is not controlled, increase the opioid dose (may consider oral hydromorphone or morphine) ◊ Add adjuvant medications to medication regimen as possible/needed to reduce opioid requirements • The patient's report of pain is the standard assessment tool to gauge if the pain management regime is adequate • Pediatric and unresponsive/non-verbal patients require alternate methods of assessment of non-verbal cues of distress • Numerical distress or visual/analog scales can provide standardized assessment • Adjuvant medical (anti-depressants, etc.) and non-medical treatments (acupuncture, etc.) may be valuable – expert consultation should be obtained in disasters where a longer timeframe allows these treatments to be implemented • Provision of non-medical comforts (company, quiet environment or music, pillows, etc.) is a critical component of palliative care and should be optimized according to patient needs **Opioid Management Principles for Disaster Situations:** • Oral morphine is the standard opioid from which potencies and conversion ratios are based for most other opioid medications • Opioids can be given by almost every possible route – oral, sublingual, intravenous, intranasal, intramuscular, rectal, or subcutaneous • Pain equivalence tables can vary. Incomplete cross tolerance exists when converting between different opioids – consider dose reductions of 25 – 50% for initial doses when switching drugs (depending on clinical circumstances)	*Prepare* *Adapt*			

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Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
	• Opioids typically do not have ceiling effects for analgesia. Limitations are usually related to side effects or intolerances • Patients with sustained-release opioid needs usually require short-acting opioid for breakthrough pain as well as for dose-finding for long-acting opioid dose adjustments. Short-acting breakthrough dose should typically be 10 -15 % of total 24 hour daily requirement of the sustained-release opioid • When dosing with opioids, remember common side effects and treat accordingly (e.g., constipation, nausea, pruritis, confusion, sedation). Respiratory depression is a rare event related to opioid dosing and usually occurs in the context of multiple drug class utilization, and other underlying chronic clinical conditions • Fentanyl transdermal patches require good adipose stores to be effective, as the real physiologic reservoir is underlying adipose tissue. If patients are thin, think of other opioid options • Best opioids to consider in the face of renal insufficiency include methadone, fentanyl, and dilaudid • Breakthrough dose: ⅓ to ½ of the twelve hour dose or 10-15 % of the 24 hour dose (if >3 breakthrough doses per 24 hr period consistently required, consider retitration of dose) • Titrating dosage, may use the following guideline: (Pain scores from 1-10 with 10 being worst imaginable) Pain > 7 Increase dose by 50% to 100% Pain 4 – 7 Increase dose by 25% to 50% Pain < 4 Increase dose by 25% if indicated/desired • Once a patient has 2 or fewer breakthrough doses and a steady state of medication has been reached, then a continuous release equianalgesic opioid may be initiated. Always start with an instant release before switching to continuous release. Note that continuous release opioids do not have mg/mg equivalence - e.g. a patient requiring 60mg of morphine elixir each day would not be started on 60mg of MS Contin as an equivalent dose • Switch from fixed combination acetaminophen/opioids to a single entity opioid when acetaminophen dose > 3000 - 4000 mg / day or as weight appropriate • Avoid fixed dose combination analgesics in pediatric patients when possible to allow more effective titration and avoid excess acetaminophen dosing • Consider use of methadone where available particularly for outpatient management of pain	*Prepare* *Adapt*			
Tracking	**Tracking:** • Assure that patients referred to home care (formally or informally) are tracked by public health and the appropriate agencies	*Prepare*			

Key Symptoms and Treatments:

Symptom	Pharmacologic Options	Additional Strategies
Pain	See 'WHO ladder' on page 7	Integrative therapies, acupuncture, hypnosis, interventional techniques, music therapy, heat/cold therapy, supportive caring
Dyspnea	Opioids and oxygen are standard therapy, additional agents of benefit may include benzodiazepines, bronchodilators, and nebulized furosemide (20 mg IV solution with 3 mL normal saline every 4 hours as needed)	Treat underlying cause, oxygen, direct air from fan onto face; integrative therapies, hypnosis.
Nausea	Serotonin antagonists (ondansetron), substance P antagonists (apprepitant), dopamine antagonists (procholorperazine), butyrophenones (haloperidol), corticosteroids, benzodiazepines, atypical antipsychotics (olanzapine), cannabinoids, anti-histamines (meclizine) , anticholinergics (scopolamine), substituted benzamide (metoclopramide)	Treat underlying cause; consider interventional options depending on underlying cause (e.g., small bowel obstruction consider nasogastric tube), integrative therapies, hypnosis, acupuncture, music therapy, supportive caring. Consider constipation as possible etiology if on chronic opioids.
Anxiety	Benzodiazepines, atypical antipsychotics, cannabinoids, anti-depressants	Treat underlying cause, spiritual support, supportive caring, integrative therapies, hypnosis, relaxation techniques, music therapy
Agitation / Delirium	Haloperidol, atypical antipsychotics, sedatives	Provide quiet, dark environment, hydration, support sleep hygiene, minimize stimulation, consider calming soft music Identify specific underlying cause if possible: • Benzodiazepine paradoxical agitation - consider discontinuing • Opioid neurotoxicity - consider opioid rotation • Steroid psychosis - consider dose change or elimination • Opioid withdrawal - consider tapering doses
Constipation	Docusate sodium, sennosides, polyethylene glycol, lactulose, magnesium citrate, bisacodyl, glycerine, enemas	Treat underlying conditions, hydration, consider subcutaneous methylnaltrexone for chronic opioid-induced constipation – ensure no mechanical obstruction re: risk of perforation (risk higher in patients on steroids)
Diarrhea	Loperamide 2 mg tablets if not contraindicated. Other interventions according to cause.	Determine underlying cause and potential therapies
Secretion control	Sublingual atropine; 1% eye drops 2-3 drops every 3-4 hours as needed; glycopyrolate (IV 0.4 mg every 4-6 hours, oral 2 mg every 8 hours or appropriate weight-based dose); scopolamine patch	Education for family regarding: death rattle, reposition in bed, very gentle suction +/-, mouth care
Skin breakdown / protection		Treat underlying cause, gentle repositioning, supportive pads, air mattress, specialty beds
Active dying	Aggressive supportive care depending needs. Do not 'prolong dying process' with on-going therapies such as transfusions, IV fluids, artificial nutrition, antibiotics. Stop medications that have no bearing on symptom support management. Focus on the 'patient as person' – not on clinical indicators. Oxygen does not offer symptom benefit for actively dying patients and oxygen delivery devices can be uncomfortable and cause sensations of claustrophobia.	Supportive care of family, education about dying process, spiritual support, psychosocial support, company, listening, storytelling, silence, companionship. Discontinue monitors and vital signs documentation.

DOSE CONVERSION TABLE FOR SELECTED OPIOIDS

(Consider dose reduction between opioid in view of incomplete cross tolerance)

Hydromorphone IV (mg / day)	Hydromorphone PO (mg/day)	Morphine IV (mg/day)	Morphine PO (mg/day)	Fentanyl* Transdermal (mcg/hr)	Oxycodone PO (mg/day)
2.5	12.5	17	50	25	30
5	25	33	100	50	65
7.5	37.5	50	150	75	100
10	50	67	200	100	130
12.5	62.5	83	250	125	165
15	75	100	300	150	200
17.5	87.5	117	350	175	230
20	100	133	400	200	265
22.5	112.5	150	450	225	300
25	125	167	500	250	330
27.5	137.5	183	550	275	360
30	150	200	600	300	400

* Transdermal Fentanyl absorption and response may vary depending on amount of adipose tissue present (i.e. better absorbed in patients with more adipose tissue, worse absorption in thin patients). Also, consider dose reduction (e.g. 25%) if transitioning from transdermal patch to oral opioid equivalent

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