Arkansas COVID-19 Crisis Standards of Care

ARKANSAS DEPARTMENT OF HEALTH

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Acknowledgements

A 15-member Arkansas COVID-19 Crisis Standards of Care Plan Review Committee was created by the Arkansas Department of Health leadership during the Fall of 2020 to compile, review, and finalize the plan. The members were chosen from various medical specialties, health systems, and geographical locations across the state. The 15-member committee members include:

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I. Executive Summary

The mission of the Arkansas Department of Health (ADH) is to protect and improve the health and well-being of all Arkansans. To accomplish this goal, the health department is divided into five Centers and one independent office, each with a particular focus to ensure optimal health for all Arkansans. The Center for Health Protection and the Office of Protection and Emergency Response System use science-based approaches to assist communities in protecting the health and safety of the people of Arkansas by:

- Preventing, detecting, and responding to infectious diseases
- Preparing for and responding to natural disasters and international health threats
- Preventing injuries and responding to trauma and emergencies
- Ensuring control and accountability of controlled substances
- Assuring the quality of health care facilities and services

The five Branches that reside in the Center for Health Protection are Health Systems Licensing and Regulation, Immunizations and Outbreak Control, Infectious Disease (STI/HIV/TB/HEPC), Trauma/ Injury and Violence Prevention, Pharmacy Services and Drug Control.

This coronavirus disease 2019 (COVID-19) Crisis Standards of Care (CSC) plan is intended to provide comprehensive guidance and support to manage COVID-19 in Arkansas, the structure for coordinating response activities, and guidelines for altering normal patient care and treatment decisions. The plan is designed to assist healthcare providers in their decision-making to maximize patient survival and minimize adverse outcomes (including worsening disparities and inequities) that might occur due to changes to normal operations when the volume of patients surpasses the capacity of healthcare providers/facilities and normal standards of care can no longer be maintained.

The CSC plan is an annex of the ADH All-Hazards Emergency Operations Plan (EOP). Utilization of this plan during a crisis requires a declaration of emergency by the Governor. The plan may be utilized as a part of a multifaceted response to the crisis.

Document History

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II. Introduction, Purpose, and Scope of Plan

The purpose of the CSC Plan is to provide a framework that includes the identification of tools for altering normal patient care, staffing, medical equipment, supplies, and treatment decisions in a massive public health emergency wherein demands related to patient care and public health radically exceed available resources. When the volume of patients and their needs far surpasses the capacity of healthcare providers/facilities and the continued use of normal standards and operations will constitute a failure of care, drastic changes, including implementation of CSC must be put into effect.

This CSC Plan is designed for use by policymakers in public health, emergency response, and acute patient care and long-term care positions, when confronting massive public health emergencies requiring the decision to move from normal operations to crisis operations and the return to normal operations when conditions improve. This CSC Plan describes the activation process used by the state of Arkansas and health providers during COVID-19 or other public health emergencies as well as the roles and responsibilities for each. This CSC Plan provides ethical guidance as health care providers face the complex decisions of reallocation of scarce resources away from patients whose outcome is not dependent on the resources or care provided.

There is a continuum of the provision of health care from normal standards of care to contingency care to CSC. This CSC Plan is intended to describe the assignment of the limited available resources--while also attempting to avoid further inequities and disparities—to those patients that will perish if they do not receive the resources but will likely survive if they do. Regardless of the location or magnitude of an event, this Plan is to be implemented only during a declared State of Emergency in Arkansas (crisis level). Appendices have been included to provide tools to assist with ethical decision-making and the allocation of scarce resources.

The purpose of this plan is to provide an ethical, reasonable, transparent, and flexible framework to achieve the following:

- Guide Arkansas healthcare providers, systems, and facilities to support consistent and equitable resource allocation decisions—without thoughtlessly worsening disparities—during a massive public health emergency
- Optimize the quality of care that can be provided to the largest number of patients presenting to an overwhelmed healthcare system (population-based healthcare)
- Minimize serious illness and death by administering a finite pool of resources to those who have the greatest opportunity to benefit from them
- Maximize self-triage and self-care by the general public using a variety of media to deliver public health messages
- Provide a legal framework for developing triage decisions and utilizing non-standard healthcare facilities (alternate care sites) and resources in an emergency

- Maximize resource and public safety protection to allow the healthcare delivery system to operate effectively and recover quickly following the CSC event

A. CSC Plan Concepts

- This CSC Plan is not considered a substitute for healthcare emergency management planning. These standards are intended to guide the allocation of scarce resources after all other measures have been exhausted.
- Strategies and options must be considered and planned in advance since adequate time for consideration and planning may be impossible during a massive public health emergency.
- This CSC Plan is not a stand-alone plan for healthcare providers. The CSC Plan exists within the framework of existing all-hazards response plans and must be integrated into all levels of healthcare planning.
- Deployed strategies and options must be proportional to the resources available. The level of risk strategies deployed must be a function of resource availability.
- Healthcare services and facilities may not have an option to wait for a state or other agency action before implementing CSC in a no-notice event; local circumstances may force local decision-making and actions.
- Stewardship of resources, duty to care, soundness, fairness, reciprocity, proportionality, transparency, and accountability are guiding ethical elements of this plan. This ethical foundation has been integrated into a set of public health and emergency response principles to establish this common framework for statewide CSC.

III. Situation and Planning Assumptions

A. Situation

According to the US Census Bureau, 3,017,804 citizens live in Arkansas, as of June 2021. There are 75 counties serviced by 94 local health units and 77 local offices of emergency management. Seven Healthcare Coalitions administer the federal Healthcare Preparedness Program (HPP): Arkansas Valley, North Central, Northeast, Northwest, Metro, Southeast, and Southwest. There are 44 acute care hospitals, 28 critical access hospitals, and several rural hospitals that are part of the Small Rural Hospital Improvement Grant Program. Arkansas is primarily a rural state.

The ADH practices ongoing disease, illness, and injury surveillance to maintain situational awareness of the health status of Arkansans. While some public health emergencies progress more slowly and allow time for some preparation, other public health emergencies are sudden and allow no time for preparation. Ongoing Threat and Hazard Identification and Risk Assessments, as well as health surveillance efforts, help policymakers and providers better prepare for and respond to massive public health emergencies.

During a massive public health emergency, the Arkansas Department Health Emergency Operations Center (EOC) will be activated and will monitor health and medical services across the state. The ADH will provide situational awareness to the Arkansas Department of Emergency Management (ADEM). Upon assessment of a massive public health emergency, ADEM may activate the Arkansas State Emergency Operations Center (SEOC). As needed, the SEOC may coordinate additional support services, other state agencies, local and regional public and private partners, and the federal government. The SEOC may be partially or fully activated, and at such time, the EOC will become a supporting agency to the SEOC.

B. Planning Assumptions

A massive public health emergency can occur in the state at any time and any place. Such a disaster or emergency may create significant human suffering, property damage, and economic hardship to individuals, families, communities, government, and businesses. The ADH, in conjunction with other state agencies and partners, is primarily responsible for health and medical services and health emergency preparedness and has shared responsibilities with the state and federal government for national security preparedness. The ADH recognizes that many emergency situations may directly produce severe consequences and the varying degrees of impact will affect the response. Relating to this CSC Plan, the following assumptions are held:

- A massive public health emergency event occurs which leads to a severe and continued lack of a medical resource which could include staffing, material, or space.
- There could be a lack of the resource or an extreme increase in the number of patients needing the resource.
- The lack of the resource results in a crisis within the health care delivery continuum which results in an increase in morbidity and/or mortality among many patients.
- Adequate alternatives for the limited resources will not be available in time to prevent further injury, illness, or death.
- All local, regional, and broader reaches for the limited resources will be inadequate. The situation may be the result of a lack of the resource itself or the inability to deliver the resources to the needed area due to one or more failures of critical infrastructure or other factors.
- Health care administrators and providers will lack the resources to limit the crisis and resolution will not occur soon enough to prevent further loss of life.
- Agencies responding to a CSC situation may utilize non-approved drugs or devices following an FDA-issued emergency use authorization.

C. Organization and Assignment of Responsibilities

Response Entity	Role	Responsibilities
Secretary, Arkansas Department of Health	Lead health official; recommends activation of CSC framework	• Approves implementation of CSC plan during a public health emergency/ disaster response • Serves as liaison to the Governor's Office; issue Secretary's orders as appropriate to the event to protect the public's health
Federal Emergency Management Administration (FEMA)	Response and recovery coordination and assistance	• Assists response efforts providing resources and response management personnel • Assists recovery efforts providing resources, funding, and response management personnel
Governor, State of Arkansas	Oversees response and ensures coordination among relevant state agencies	• Proclaims a state of emergency within the entire state or any portion or portions of the state • Requests Federal Emergency Disaster Declaration • Issues emergency declarations and specific emergency orders to address incident-specific issues • Has ultimate authority for State response
Healthcare Coalitions (HCC)	Regional coordination of health/medical response	• Coordinate Information sharing and activities between public health, hospitals, EMS, and emergency management • May provide/develop regional policies for disaster response/crisis care • Help manage resources between hospitals in the area
Healthcare Facilities	Acute patient care	• Implement surge plans including local CSC • Implement facility or regional triage/treatment plans as required • Coordinate information and resource management with other facilities in the region via the HCC

Response Entity	Role	Responsibilities
Healthcare provider and Hospital Networks	Regional coordination of health/medical response	• Facilitate communication among network affiliates • Facilitate resource allocation among network affiliates • Facilitate patient care and surge coordination among network affiliates • Facilitate financial management and coordination among network affiliates
Local Office of Emergency Management (OEM)	Local lead for emergency management	• Requests resources locally or through the State Emergency Operations Center (SEOC) • Can declare an emergency and request the Governor to find that a state of emergency exists • Makes, amends, and rescinds such local orders, rules, and regulations as may be necessary for emergency management purposes • Provides essential elements of information to local and state government agencies
Local EMS Agency/ First Responders	Emergency medical response and patient transport	• Often the first personnel on scene to assess and report the situation, provide initial triage and care, and help determine what additional resources may be needed • Develop policies for crisis care situations • Interface with local hospitals and regional HCC to share information/status • Request adjustment to response and transport guidelines to reflect the situation at the hospital during disaster
Health and Human Services (HHS) Region 6 (AR, LA, TX, NM, OK)	Regional coordination of health/medical response, support agency	• Coordinates regional resource management • Provides response management personnel • Coordinates communication between state and federal partners
Arkansas Department of Health (ADH)	Lead state agency for Health and Medical Services	• Facilitates health care resource requests to state/interstate/federal partners

Response Entity	Role	Responsibilities
		• Requests state of emergency declarations and governor's emergency orders as required to support response • Activates other consulted subject matter teams and Subject Matter Experts (SMEs) as needed to help inform specific actions and develop outreach strategies • Provides clinical guidelines/guidance • Requests specific emergency orders/actions by the Governor's Office • Supports HCC information exchange and policy development • Provides treatment and other health-related guidance for clinicians, local and tribal public health leaders, and community members based on the nature of the event • Develops, through the ADH Public Information Officer (PIO), communications for the public and providers on crisis issues • Acts as the key liaison to HCCs in the state
Arkansas Department of Emergency Management (ADEM)	Lead state agency for Emergency Management	• Coordinates the activities of all emergency management organizations within the state • Maintains state-wide situational awareness overall of disaster response and recovery • Makes a recommendation to the Governor to proclaim a state of emergency within the entire state or any portion or portions of the state • Recommends to the Governor that a Federal Disaster Declaration request be made to the President
Arkansas National Guard	Resource coordination and transport	• Provides logistics support • Provides specialized medical services and coordination when possible • Provides supportive duties as requested by the Governor

D. State CSC Committee

The Arkansas CSC Committee is composed of representatives from various components of healthcare delivery who are responsible for reviewing data associated with the disaster and making recommendations as to the state's need to move from conventional care delivery to CSC. The committee makes recommendations to the Secretary of Health who will advise the Governor. The Governor decides when CSC are implemented state-wide.

Committee Members

Voting Members
• Chief Medical Officer or designee - Arkansas Department of Health (ADH) • Director - Office of Preparedness and Emergency Response Systems (OPERS) • Medical Director - OPERS (ADH) • General Counsel - ADH • Chief of Staff - ADH • Representative - Arkansas Department of Emergency Management (ADEM) • Representative - Arkansas Healthcare Association (AHCA) • Representative - Arkansas Hospital Association (AHA) • Representative - Arkansas Rural Health Partnership • Representative - Arkansas Children's Hospital • Representative - Arkansas Ambulance Association • Representative - Arkansas Medical Society • Medical Ethicist (to be appointed by the Governor's Office)
Non-Voting Members
• Secretary of Health • Director - ADH Office of Health Communications

IV. Continuum of Care: Conventional, Contingency, and Crisis Standards

Three levels of care are defined by the National Academy of Medicine and are the basis for determining likely levels of surge, resources, and staffing during a disaster. These levels are the basis for CSC planning:

- Conventional Care: The demand for care is less than the supply of resources. The level of care is consistent with daily practices in the situation.
- Contingency Care: The demand for care surpasses conventional resources availability but it is possible to maintain a functionally equivalent level of care quality by using contingency care strategies. The facility's Emergency Operations Plan is activated.
- Crisis Care: The demand for care surpasses the resource supply despite contingency care strategies. Normal quality standards of care cannot be maintained.

Table 1: Continuum of Care as a function of Healthcare Resources and Staffing

SITUATION	Conventional	Contingency	Crisis
SURGE STATUS	Healthcare facilities utilize normal bed capacity. Occasional surges of demand may occur that are temporary and may incur longer wait times for non-critical care as hospitals, ICUs, and emergency departments temporarily reach capacity.	Healthcare facilities have surged beyond maximum bed capacity. Emergency Operations Plans are in effect. Elective procedures delayed. Hospitals may be adding patients to occupied hospital rooms and non-patient care areas. Community healthcare facilities may be requested to surge. Alternate sites may be opened.	Expanded capacity is still not sufficient to meet the ongoing demand for care. Some patients needing care cannot be admitted to hospitals and instead will be sent home to alternate care sites. Hospitals are adding patients to occupied hospital rooms and non-patient care areas. Community healthcare facilities are operating beyond their normal scope of practice. Additional alternate care sites may be opened.
RESOURCE LEVEL	Occasional, limited resource shortages may occur, typically of non-critical supplies or medications with substitution as the most common resource-sparing strategy.	Some resources are becoming scarce. Attempts at conservation, reuse, adaptation, and substitution may be performed.	Some or even many critical resources are unavailable, potentially including hospital beds, ventilators, and medications. Critical resources are reallocated to help as many patients as possible.
STAFF	Usual staffing. Healthcare facility staff absenteeism is not a large problem.	Staff extension (increased patient/ provider ratios, expanded scope of practice). Healthcare facility staff absenteeism may be a problem.	Staffing is at a critical shortage level. Staff is operating outside their normal scope of practice and at greatly increased patient/provider ratios. Healthcare facility staff absenteeism may be greater than 30%.

A. Facility/ Agency Triggers (Hospital or Healthcare Facility)

The conventional indicators listed below represent normal levels of surge for most healthcare facilities. In general, if one or more contingency or crisis level indicators are true, then the healthcare facility may decide to activate contingency standards of care or follow the prescribed process to request CSC.

The indicators listed provide guidance for hospitals and healthcare facilities in determining the level of care during a disaster. These indicators should serve as triggers for activating facility-level plans and procedures and may also prompt resource requests to other healthcare facilities and county health departments.

Strategies for scarce resource situations at the hospital level are listed in the Appendix starting on page 19.

Table 2: Conventional, Contingency, and Crisis Indicators for Hospitals and Healthcare Facilities

Conventional Indicators for Hospitals and Healthcare Facilities
• Usual patient care space fully occupied • Usual staff called in and utilized • Cached and usual supplies being used
Contingency Indicators for Hospitals and Healthcare Facilities
• Patient care areas re-purposed (e.g., Post-anesthesia care unit or monitored unit used for Intensive care unit level care) • Staff extension in place (brief deferrals of non-emergency patient-care services, supervising broader groups of patients, changes in responsibilities and documentation, etc.) • Conservation, adaptation, and substitution of supplies with selective re-use of supplies for an individual patient
Crisis Indicators for Hospitals and Healthcare Facilities
• Healthcare facility unsafe or closed • Non-patient care areas used for patient care • Trained staff unavailable or unable to care for the volume of patients • Critical supplies lacking • Re-allocation of life-sustaining resources (Palliative care/Ethics consult) • Patient transfer not possible or insufficient

B. Local Triggers (Arkansas Hospital Regions/Healthcare Coalitions)

The activation of CSC starts at the local level (see Figure 1. Arkansas Hospital Regions map). The examples in Table 3 may be used by local officials to identify trigger points for declaring a local disaster or requesting the Governor's disaster declaration and implementation of CSC.

Figure 1. Arkansas Hospital Regional Map

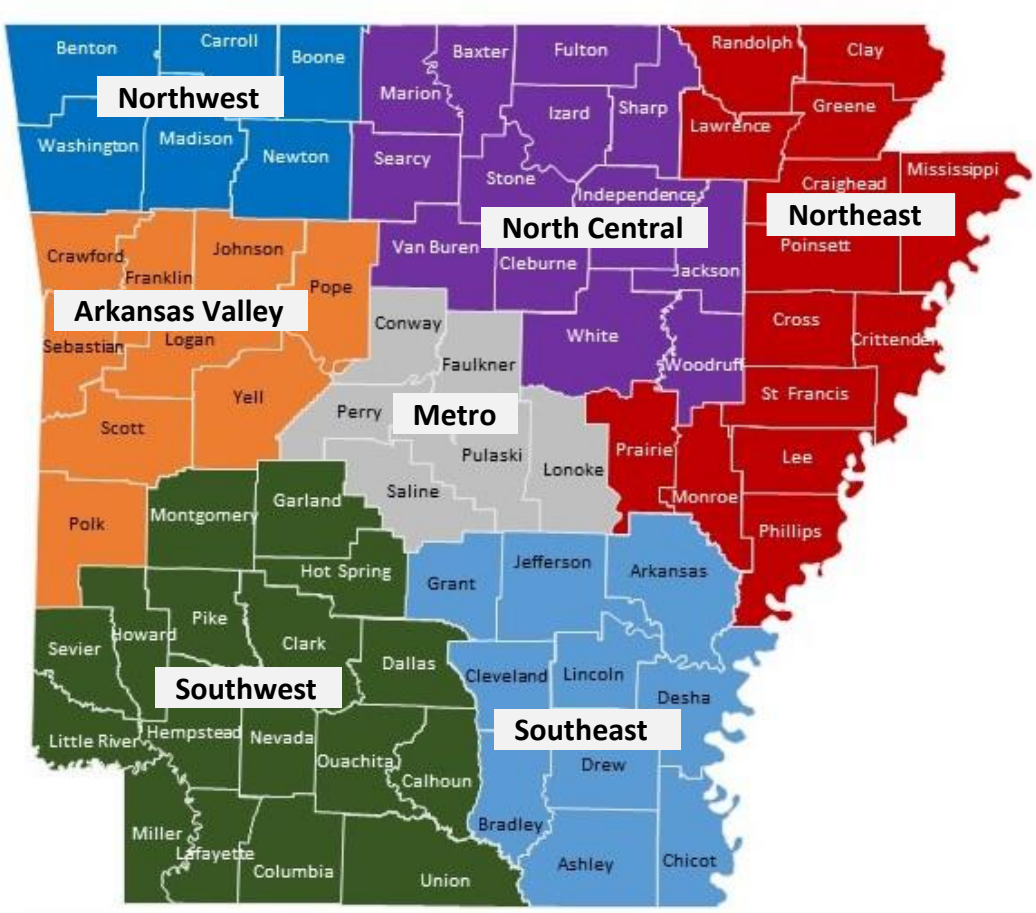

Table 3: Conventional, Contingency, and Crisis Indicators for Local Jurisdictions

Conventional Indicators for Counties
• One or more healthcare facilities are at or near capacity. • Patient transfer may be impacted
Contingency Indicators for Counties
• One or more healthcare facilities initiate local resource requests for space, staff, and supplies • Medical countermeasure availability declining • One or more hospitals on diversion • Patient transfer limited between healthcare facilities
Crisis Indicators for Counties
• One or more healthcare facilities must use contingency standards of care • Medical countermeasures depleted • Patient transfers insufficient or impossible, county-wide or regionally • Facility resource requests unfillable or undeliverable • Alternate care sites planned

C. State-level Triggers

The indicators listed below may be used by the ADH and other state policy makers to determine the need for CSC. The Secretary of Health, in conjunction with the Arkansas CSC Committee, will recommend to the Governor the precise trigger point for CSC.

Table 4: Conventional, Contingency, and Crisis Indicators for the State

Conventional Indicators for the State
• One or more healthcare regions at capacity • Patient transfer may be impacted
Contingency Indicators for the State
• Local jurisdictions initiate resource requests • Medical countermeasure availability declining • One or more hospitals on diversion • Patient transfer is limited across all or part of the state with normal transfer patterns across state lines
Crisis Indicators for the State
• One or more counties/ hospital regions request the State to implement CSC • Medical countermeasures depleted • Patient transfers limited or impossible statewide • Local jurisdiction resource requests unfillable or undeliverable • Multiple healthcare access points impacted • Alternate care sites planned

D. Arkansas Centralized Transfer System (ATCC) for COVID-19 patients

The ATCC is a centralized system to facilitate the transfer of confirmed COVID-19 patients who require hospital admission and who are unable to be admitted to the facility to which they present. When a patient presents to an emergency department and is deemed appropriate for admission to the hospital, every effort should be made to admit them to that facility. If the facility is unable to accommodate the admission (i.e., no hospital beds available, no ICU, etc.), the treating provider can call ATCC at 1-866-940-1409 to request a transfer. ATCC will gather information utilizing a clinical assessment tool to determine the most appropriate facility to care for the patient. Not all patients will require admission to tertiary care hospitals.

Arkansas hospitals have been characterized as either a Level 1, Level 2, or Level 3 facility by a group of clinical experts based on ICU capabilities and access to specialist care. The clinical tool, a hybrid between the Brescia COVID Respiratory Severity Scale (BCRSS) and the quick COVID-19 Severity Index score, will be used to determine whether the patient requires a Level 1, 2, or 3 facility. The providers at ATCC will then contact the closest, most appropriate hospital with an

open bed and facilitate the physician-to-physician hand-off. After the patient has been accepted, the sending facility will arrange transport for the patient. Transfer should be initiated when patients require admission based on their COVID diagnosis (i.e., respiratory compromise, new oxygen requirement, etc.) and they are unable to be cared for at the initial facility. This system should not be used to transfer patients needing inpatient admission for other diagnoses.

E. COVID-19 Long Term Care Transfer Assistance Hotline

A surge in positive COVID-19 cases results in increased hospital census and staffing difficulties for all provider types, potentially causing difficulties in post-acute care placement. A hotline to address difficulties in transferring a patient that is ready for discharge to a skilled nursing or long-term care facility has been established and can be accessed via phone at 501-621-5500 or email LTCTransferHelpDesk@arhealthcare.com.

The hotline will be staffed during regular business hours, Monday through Friday, and will provide assistance in directing calls regarding placement.

Principles for hotline usage:

- All existing channels of communication for placement should be explored first.
- The hotline does not replace direct communication with individuals that currently provide assistance with placement challenges. The hotline is to be used once all other options are exhausted.
- Discharging patients should be asked to consider more than one option for placement, at least temporarily.
- Sufficient time should be allowed for authorizations to be obtained from payer sources, particularly Medicare Advantage Plans.
- These plans may still require authorizations prior to admission to a post-acute care provider and might also require a certain length of stay in the hospital prior to authorizing post-acute care.
- Authorizations may be required even for patients that are COVID-19 positive.

The following information will need to be provided to the hotline:

- Patient name
- Actions taken prior to calling the hotline
- Top three choices for post-acute care facility
- Patient's COVID-19 status and most recent test, if any
- Patient's payer source

F. End of Life/Hospice/Palliative Care Consults

The University of Arkansas for Medical Sciences (UAMS) Physician Call Center provides a single number (501-686-6080) to assist physicians and other health care providers from hospitals across the state 24/7, 365 days of the year for End of Life/Hospice/Palliative Care consults from outside hospitals during a crisis surge. The call center offers assistance with symptom management, end-of-life care and medication management, advance care planning/surrogate decision-making, and palliative or terminal extubation protocols.

G. Alternate Care Sites

In case of surge due to a crisis at local and regional hospitals, regional alternate care sites will be established for each Arkansas hospital region/healthcare coalition. This may be a mobile treatment facility or a convention center with makeshift beds managed by extra help staff hired on a temporary basis or through locum tenens. National Guard may be activated to assist with the surge.

H. Notification and Activation

1. *Facility/ Agency (Hospital or Healthcare facility)*
   A facility or agency that recognizes the need for the implementation of CSC will notify the local office of emergency management (OEM) as well as the ADH.

2. *Local Jurisdictions (Arkansas Hospital Regions/Healthcare coalitions)*
   Local/ county officials will identify the need and request a disaster declaration utilizing routine communication channels.

3. *State*
   The CSC committee in conjunction with the Secretary of Health will provide a recommendation to the Governor regarding the implementation of CSC. If the Governor adopts the recommendation, the Governor may authorize activation of these CSC by the Secretary of Health through an executive order. Once authorized and activated, these CSC may be implemented under the executive order.

Upon signature of an executive order authorizing activation of this plan and signature of the Secretary of Health activating these CSC, the CSC committee will coordinate with state agencies to disseminate the executive order and activation to local jurisdictions and agencies.

When a healthcare facility/agency, local jurisdiction, healthcare coalition, region, or other healthcare entity enters a crisis level of care, as defined in this plan, it may adopt the relevant CSC practices. Any entity entering a crisis level of care and adopting CSC shall notify the ADH.

I. Quality Improvement (QI)/Quality Assurance (QA)/Appeals Committee

Institutions should develop processes for oversight of the (re-) allocation practices. To ensure quality and handle appeals, institutions should form a Scarce Resources Committee, which can establish triage policies and practices, hear appeals based on concerns regarding allocation processes, and provide regular quality assurance reviews. This could be for (re-) allocation decisions on vents or dialysis or other resources so that an ethically grounded system guides decision-making in crises and ensures the most appropriate use of resources that addresses health disparities and ensures health equity. The recommended ethical principles are:

- **Fairness** – standards that are, to the highest degree possible, recognized as fair by all those affected by them – including the members of affected communities, practitioners, and provider organizations, evidence-based, and responsive to the specific needs of individuals and the population
- **Duty to care** – standards that are focused on the duty of healthcare professionals to care for patients in need of medical care
- **Duty to steward resources** – duty of healthcare institutions and public health officials to steward scarce resources, reflecting the utilitarian goal of saving the greatest possible number of lives
- **Transparency** – in design and decision making
- **Consistency** – in application across populations and among individuals regardless of their human condition (e.g., race, age, disability, ethnicity, ability to pay, socio-economic status, preexisting health conditions, social worth, perceived obstacles to treatment, past use of resources)
- **Proportionality** – public and individual requirements commensurate with the scale of the emergency and the degree of scarcity of resources
- **Accountability** – of individual decisions and implementation standards, and of governments for ensuring appropriate protections and just allocation of available resources

This framework has been nationally accepted and adopted and has been used by various counties and several other states in the United States.

J. Additional Resources for Hospitals When Crisis Indicators Are Met During a Surge

- Statement by America's Health Insurance Plans Board of Director Helping Our Hospital and Health System Partners Build Capacity and Confront Coronavirus (March 2020)
- Ambulatory Surgery Center Association resource page for state COVID-19 waivers and emergency rules
- NCQA (National Committee for Quality Assurance) resource page on credentialing issues and COVID-19
- CMS background on 'hospital at home' and strategies to enhance capacity

K. Deactivation of CSC

Planning for deactivation should begin once the CSC has been activated. The Governor's office, based on the recommendation of the CSC Committee, will deactivate CSC by terminating the CSC executive order when healthcare facilities are no longer operating at a crisis level. The CSC may be deactivated across the entire state or for portions of the state depending on the pace of recovery.

Once a healthcare coalition, region, county, healthcare facility/agency, or other healthcare entity's level of care returns to a contingency or conventional level of care, that entity must return to conventional standards of care. An entity that previously adopted CSC shall notify the ADH when it returns to conventional standards of care.

The following procedures may be employed to ensure a coordinated deactivation of CSC standards across the state:

- Throughout the response, the ADH, CSC Committee, and local officials will coordinate with healthcare facility staff to analyze situation reports (SitReps) and updates to determine the continued need for crisis-level care across the state.
- When it is anticipated that most healthcare facilities and jurisdictions will return to contingency-level care within 48 hours, ADH will send a notice to statewide healthcare partners stating that "it is anticipated that CSC will be rescinded within 48 hours." This timeframe will allow healthcare facilities to prepare for the transition back to contingency surge, conventional surge, or normal operations as appropriate. ADH, in consultation with the CSC Committee, will issue Health Alerts and public messaging to prepare for CSC deactivation.

Note that the deactivation of CSC does not stop emergency operations at the state, local, or facility level. Emergency operations and emergency declarations at the jurisdictional or facility level may still be in place despite the deactivation of CSC. The recovery phase of any event will be managed according to existing plans within Arkansas and not separately under this plan.

Communication that the CSC has been deactivated will be sent to local, state, and federal response partners by ADH.

L. Modification of CSC While Activated

Managing the COVID-19 pandemic disaster may require rapid adjustments to these CSC. Once this plan is authorized through executive order and activated by the Secretary of Health, these CSC may be modified while they are activated. To do so, the CSC Committee may recommend any modification to these CSC, including modifying or terminating an existing standard or adding a new standard. The Secretary of Health is authorized to adopt the CSC Committee's recommendations if he or she concurs with them. Upon adoption of the CSC Committee's recommendation by the Secretary of Health, the modification shall become part of these CSC with the full force and effect of the rest of this plan, its authorization, and its activation.

APPENDIX

Strategies for Patient Care

Adapted from the Minnesota Healthcare Preparedness Program
https://www.health.state.mn.us/communities/ep/surge/crisis/standards.pdf
(Accessed on 8/27/21)

The following appendix includes strategies for patient care in a scenario of critical shortage/limitation of resources for patient care. It serves to provide a broad framework to consider when developing explicit hospital, community, and system-wide practices and protocols when dealing with such a scenario. It is not meant to be prescriptive as to the approach taken by local healthcare institutions in dealing with the issues associated with critical limited patient care resources. The local context of the hospital, community, and system must be taken into consideration when creating and implementing specific hospital, community or system-wide plans for resource utilization and allocation.

The strategies for patient care listed below serve as examples of some best practices for patient care based on the hospital, community, and system-wide capacity (conventional contingency, or crisis). During crisis standard of care (CSC) conditions not only the strategies herein but also further considerations of equity, ethical, and other moral norms for public health allocations should be considered. Engaging with a local hospital-level or hospital-system ethics committee, if available, is recommended during CSC conditions.

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PATIENT CARE Summary Card

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

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 essentially equivalent device, drug, or personnel for one that would usually be available (e.g., morphine for fentanyl).
Adapt – use 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 massive public health emergency (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 health care 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). 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.

Facilities and personnel implementing these strategies in crisis situations should assure communication of this to their health care 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 Arkansas Department of Health (ADH).** The weblinks and resources listed are examples and may not be the best sources of information available. Their listing does not imply endorsement by ADH. This guidance does not replace the judgement of the clinical staff and consideration of other relevant variables and options during an event.

Reference: Hick JL, Barbera JA, Kelen GD. Refining surge capacity: conventional, contingency, and crisis capacity. Disaster Medicine and Public Health Preparedness , Volume 3 , Issue S1 , June 2009 , pp. S59 - S67

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OXYGEN

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Inhaled Medications • Restrict the use of oxygen-driven nebulizers when inhalers or air-driven substitutes are available. • 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 flow rates in excess of 40 LPM. • 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. • Place patients on ventilators as soon as possible to avoid prolonged use of bag-valve ventilation at high oxygen flow rates	*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 flow rates 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 SpO_2 or PaO_2. • Minimize overall oxygen use by optimization of flow. • Discontinue oxygen at earliest possible time. **Starting Example** / **Initiate O_2** / **O_2 Target** Normal Lung Adults: SpO_2 <90% / SpO_2 90% Infants & Pediatrics: SpO_2 <90% / SpO_2 90-95% Severe COPD History: SpO_2 <85% / SpO_2 90% **Note**: Targets may be adjusted further downward depending on resources available, the patient's clinical presentation, or measure SpO_2 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*			

Resource: Considerations for Oxygen Therapy in Disasters. This Assistant Secretary for Preparedness and Response Technical Resources Assistance Center, and Information Exchange (ASPR TRACIE) fact sheet provides information on the types of oxygen therapy and the types of oxygen supplies generally available, as well as various oxygen storage methods.

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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 credentialing and privileging - including degree of supervision required, clinical scope of practice, mentoring and orientation, electronic medical record access, and verification of credentials. • Encourage employee preparedness and 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. • Implement efficient medical documentation methods appropriate to the incident. • Cohort patients to conserve PPE and reduce staff PPE donning/doffing time and frequency.	*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 (e.g., 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. • Limit availability/indications for non-critical laboratory, radiographic, and other studies. • Reduce documentation requirements. • Restrict elective appointments and procedures.	*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., health care trainees or other health care workers, 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, screening 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

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. • Consider weight and dispensing issues if using 5-gallon bottles. • 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). • Consider having staff bring own food if practical to do so.	*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 preferably 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. Homemade Blended Formula Handbook. Tucson: Mealtime Notions LLC, 2007. https://cdn.ymaws.com/oley.org/resource/resmgr/webinars/Oley_Webinar_Blender- ized_Tub.pdf	*Adapt*			

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MEDICATION ADMINISTRATION

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Cache/Increase Supply Levels * • Patients should have at least 30 days' supply of home medications and obtain 90 days' supply if pandemic, epidemic, or evacuation is imminent. • Examine formulary to determine commonly used medications and classes that will be in immediate/high demand. This may involve coordination with insurance companies/pharmacies • 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 (http://www.globalrph.com/narcoticonv.htm). **Sedation** • Particularly benzodiazepine (lorazepam, midazolam, diazepam) injectables, ketamine, and antipsychotic agents. **Anti-infective** • Narrow and broad-spectrum antibiotics for pneumonia, skin infections, open fractures, sepsis (e.g., cephalosporins, quinolones, tetracyclines, macrolides, clindamycin, penam class, and extended-spectrum penicillins, 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, diabetes	*Prepare*			
Use Equivalent Medications • Obtain medications from alternate supply sources (pharmaceutical distributors, pharmacy caches). • Explore options to compound or obtain from compounding pharmacies. **Pulmonary** • Metered-dose inhalers instead of nebulized medications. **Analgesia/ Sedation** • Consider other medications (e.g., benzodiazepines, dexmedetomidine, etc.) 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.	*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 are not taken during shortage (statins, etc.)	*Conserve*			

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.**, especially tablets/capsules • 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 oseltamivir).	*Re-Allocate*			
• Determine patient priority to receive medications in limited stock.	*Re-Allocate*			

*Resources: ASPR TRACIE Hospital Disaster Pharmacy Calculator. This tool estimates the number of patients that should be planned for based on the size of the emergency department and the role of the hospital.

ASPR TRACIE Factsheet: Drug Shortages and Disasters. This factsheet can help health care providers prepare for and respond to drug shortages that may arise during and after a disaster

**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.	*Substitute & 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 10 kg of body weight (40 mL/h for 1st 10 kg) • 2 mL/kg/h for second 10 kg of body weight (20 mL/h for 2nd 10kg = 60 mL/h for 20 kg child) • 1 mL/kg/h for each kg over 20 kg (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 • Rehydration Project http://rehydrate.org/ • Managing Acute Gastroenteritis Among Children https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5216a1.htm • Intravenous Fluid Orders-A Primer 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 mini drip 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.)

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 route preferred over subcutaneous. 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*			

MECHANICAL VENTILATION/EXTERNAL OXYGENATION

STRATEGIES FOR SCARCE RESOURCE SITUATIONS

RECOMMENDATIONS	***Strategy***	***Conventional***	***Contingency***	***Crisis***
Increase Hospital Stocks of Ventilators and Ventilator Circuits, Extracorporeal Membrane Oxygenation (ECMO) or Bypass Circuits	*Prepare*			
Access Alternative Sources for Ventilators/specialized equipment • Obtain specialized equipment from vendors, health care 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 postoperative intubation. • Decrease elective procedures that utilize anesthesia machines. • Use non-invasive ventilatory support when possible. • Attempt earlier weaning from ventilator.	*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.	*Adapt*			
• 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).				
Assign Limited Ventilators to Patients Most Likely to Benefit if No Other Options Are Available **SOFA score predictive value for outcome is poor in many conditions and should be used as a relative marker for multi-organ failure (MOF) with higher scores indicating worsening levels of MOF and may be helpful as a neutral comparator** ***STEP ONE*:** Assess patient acuity using SOFA scoring table and other parameters appropriate to the situation (e.g., specific prognostic variables are available for burns, intracranial hemorrhage, etc. Documentation of their consideration is important).	*Re-allocate*			

ORGAN SYSTEM	SCORE=0	1	2	3	4
RESPIRATORY PaO2/FiO2 ratio	> 400	400	≤ 300	≤ 200 with resp. support	≤ 100 with resp. support
HEMATOLOGIC Platelets (K/ul)	> 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 mcg/kg/minute or any Dobutamine	Dopamine > 5 mcg/kg/minute or Epi < 0.1 mcg/kg/minute or Nor-Epi ≤ 0.1 mcg/kg/minute	Dopamine > 15 mcg/kg/minute or Epi > 0.1 mcg/kg/minute or Nor-Epi > 0.1 mcg/kg/minute
CENTRAL NERVOUS SYSTEM Glasgow Coma Score	15	13 – 14	10 – 12	6 – 9	< 6
RENAL Creatinine (mg/dl)	< 1.2	1.2 – 1.9	2.0 – 3.4	3.5 – 4.9	≥ 5.0

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 prioritized access to a 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[a] 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 prognosis (e.g., life expectancy under 6 months, eligible for admission to hospice).		
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. Note: Specific SOFA scores should never be used to deny a ventilator to a patient but should be used in combination with other factors to compare patients needing the resource. Higher baseline creatinine values in certain racial groups could influence SOFA value.					
[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.					

RENAL REPLACEMENT THERAPY

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.

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). 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 from the National Kidney Foundation • See the Arkansas Kidney Disease Commission - established to create a program for the care and treatment of persons suffering from chronic renal disease. They provide financial assistance for prescription medicines and provide comprehensive information about Arkansas dialysis clinics. https://www.healthy.arkansas.gov/programs-services/topics/arkansas-kidney-disease-commission **Shortage of Renal Replacement Therapy (RRT) Resources** Affected facility should contact involved/affected dialysis provider companies and organizations as expert consultants.[1]	*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*			

RENAL REPLACEMENT THERAPY

REGIONAL RESOURCE CARD

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 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 vital signs, 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 hyper-kalemia 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*			

RENAL REPLACEMENT THERAPY

REGIONAL RESOURCE CARD

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.

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

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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.

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 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.
	• Statewide incident impact:
	  • ADH will coordinate with health care 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 ADH or FEMA and/or National Disaster Medical System (NDMS) patient movement during public health emergency (unlikely to only affect pediatric portion of population).	*Adapt* *Conserve* *Substitute*			

PEDIATRICS

REGIONAL RESOURCE CARD

<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 Trauma System
<table>
<tr><th></th><th colspan="2">Critically injured[1]</th><th colspan="2">Non-critical - Age < 18</th></tr>
<tr><th>AR Trauma System Designation</th><th>< 8 years old</th><th>< 1 year</th><th>Yellow patients</th><th>Green patients</th></tr>
<tr><td>Level IV</td><td>2</td><td>1</td><td>5</td><td>10</td></tr>
<tr><td>Level III</td><td>4</td><td>2</td><td>10</td><td>15</td></tr>
<tr><td>Level II</td><td>6</td><td>3</td><td>15</td><td>20</td></tr>
<tr><td>Level I</td><td>8</td><td>4</td><td>20</td><td>30</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 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.
State trauma system guidelines also identify pediatric equipment expectations.
</td></tr>
</table>

1 Assume will require airway management, IV access at minimum

PEDIATRICS

REGIONAL RESOURCE CARD

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.	*Prepare*			
	• 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.)	*Adapt*			
	• 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. • ADH 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*).	*Conserve* *Adapt* *Substitute*			
Special	**Consider availability of resources for:** • Social work/ family support. • Psychological support for children, their families, and staff (do not underestimate the increased stress and psychological impact of a pediatric incident, particularly a mass casualty incident, on health care 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 neuro-trauma according to usual trauma triage criteria. • Patients with complex underlying medical conditions may require consultation or special triage considerations.	*Conserve*			

PEDIATRICS

REGIONAL RESOURCE CARD

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 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 health care coalitions to prioritize transportation and manage logistics via Multi-Agency Coordination. • Regional transfer coordination may be required in major disasters – ADH Center for Emergency Preparedness & Response will assist regional health care 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 health care coalition and/or multi-agency coordination system.	*Prepare* *Adapt*			

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 <8 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.

Resource list of pediatric emergency equipment:
https://www.acep.org/globalassets/new-pdfs/policy-statements/pediatric-readiness- in-the-emergency-department.pdf

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 catheter 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 ADH 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

Goals of Fluid Resuscitation: Normal vital Signs, Improved signs of perfusion, Urine output 0.5-1 mL/kg/hr

Type	Fluid	Rates and Notes
Resuscitation Fluids	NS	Initial bolus 20 mL/kg, over 30-60 min, repeat as needed
	PRBCs	Hemorrhagic shock 10 mL/kg if not responding to initial 20 mL/kg of crystalloid May use O Neg (or O Pos for males) until type-specific or cross-matched available
Maintenance Fluids Maximum of 2400 mL/day	D10W	Newborn (first 48 hrs): 3 mL/kg/hr
	D10½NS	Neonate (28 days or less): 4 mL/kg/hr
	D5NS	Pediatric patient without renal compromise: 4 mL/kg/hr first 10 kg 2 mL/kg/hr next 10 kg 1 additional mL/kg/hr for each kg over 20 kg
Hypo-glycemic Treatment over 15-30 min	D10W	Neonate with blood glucose (BG) < 45 mg/dl give 3 mL/kg IV or intraosseous (IO)
	D25W	< 4 years with BG < 60 mg/dl give 2 mL/kg IV or IO.
	D50W	≥ 4 years with BG < 60 mg/dl give 1 mL/kg IV or IO.

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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.

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 health care 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.

Planning Resources	Staff	Tracking
Communications and Coordination	Special	Key Symptoms and Treatments
Space	Triage	Dose Conversion Table for Selected Opioids
Supplies	Treatment	

Principles of Palliative Care:

- **Palliative care should be provided to ALL patients.**
- In a subset of patients, it may be the only care that can 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.
- Cultural Diversity may have impact on acceptance of palliative care offerings.

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 hospital-based 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 on pg. 58.
- 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.**

PALLIATIVE CARE

REGIONAL RESOURCE CARD

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
Planning Resources	**Planning Resources:** •General resources in palliative care and non-pharmacologic intervention: ◦ American Academy of Hospice and Palliative Medicine. ◦ Center to Advance Palliative Care. ◦ World Health Organization Essential Medicines in Palliative Care. ◦ Up To Date—What's new in Palliative Care. ◦ Arkansas Hospice: https://www.arkansashospice.org/patients-families-caregivers/arkansas-palliative-care ◦ Local resources at ADH: https://www.healthy.arkansas.gov/programs-services/topics/polst	*Prepare*			
Planning/ Communications and Coordination	◦ University of Arkansas for Medical Sciences (UAMS) Physician Call Center provides a single number (501-686-6080) to assist physicians and other health care providers from hospitals across the state 24/7, 365 days of the year for End of Life/Hospice/Palliative Care consults from outside hospitals during a crisis surge. The call center offers assistance with symptom management, end-of-life care and medication management, advance care planning/surrogate decision-making, and palliative or terminal extubation protocols. ◦ 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*			

PALLIATIVE CARE

REGIONAL RESOURCE CARD

Category	*RESOURCE and RECOMMENDATIONS*	*Strategy*	*Conventional*	*Contingency*	*Crisis*
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, ADH 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 health care systems. **Communications with Families and Patients:** • Review advance care planning in the context of the current situation – proxy designations, advance directives, https://www.healthy.arkansas.gov/programs- services/topics/polst • Interventions able to be offered may not fulfill all of the preferences expressed in those directives. • 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*			

PALLIATIVE CARE

REGIONAL RESOURCE CARD

Category	RESOURCE and RECOMMENDATIONS	Strategy	Conventional	Contingency	Crisis
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. **Outpatient Space:** Facilities should have plans in place with home health care 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. **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).	*Adapt* *Conserve* *Adapt* *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. **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.	*Prepare* *Adapt*			

PALLIATIVE CARE

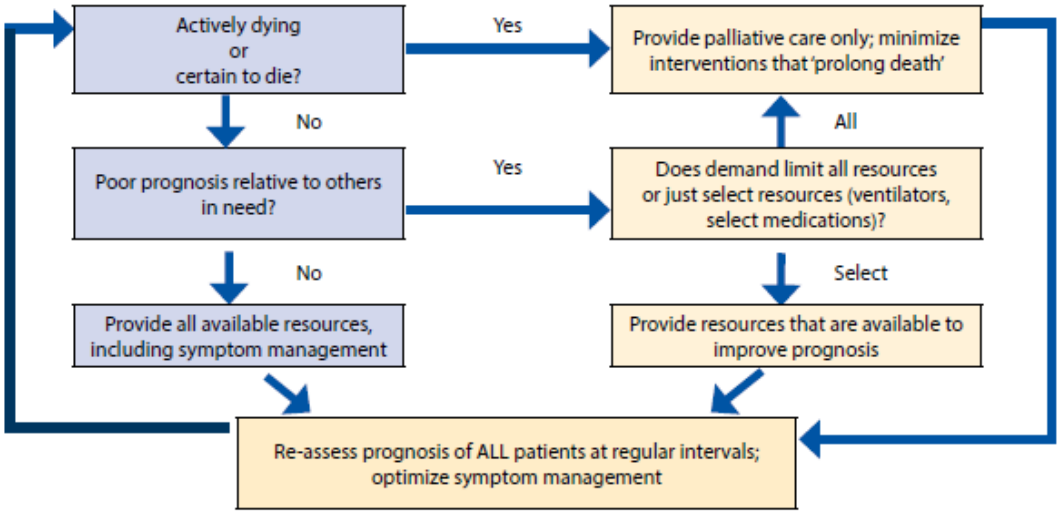
REGIONAL RESOURCE CARD

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			

PALLIATIVE CARE

REGIONAL RESOURCE CARD

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*			

PALLIATIVE CARE

REGIONAL RESOURCE CARD

Category	*RESOURCE and RECOMMENDATIONS*	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Treatment	**Treatment:** **Provide Symptomatic Management:** • Do not underestimate the psychological impact on patients, caregivers, and families 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. • '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. • Medical cannabis/cannabinoid class agents may offer symptom benefits for pain, nausea anxiety. • 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*			

PALLIATIVE CARE

REGIONAL RESOURCE CARD

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 hydromorphone. • Breakthrough dose: 1/3 to 1/2 of the twelve-hour dose or 10-15 % of the 24-hour dose (if >3 breakthrough doses per 24-hour 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 60 mg 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*			

PALLIATIVE CARE
REGIONAL RESOURCE CARD

Key Symptoms and Treatments:

Symptom	Pharmacologic Options	Additional Strategies
Pain	See 'WHO ladder'	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 (aprepitant), dopamine antagonists (prochlorperazine), 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, glycerin, 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.

ECMO (Extracorporeal membrane oxygenation)
STRATEGIES FOR SCARCE RESOURCE SITUATIONS

Resource cards are intended to provide incident-specific tactics and planning information to supplement the general strategy cards. T

Category	*RESOURCE and RECOMMENDATIONS*	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Command Control, Communication, Coordination	General Information: Extracorporeal membrane oxygenation (ECMO) is becoming used more frequently for multiple conditions that result in refractory hypoxia (venovenous ECMO) or refractory shock/cardiac arrest (arteriovenous ECMO). However, the resource is not widely available and data on its use and effect on outcomes are incomplete despite many promising small studies. Procedure: • In a situation where an institution does not have available ECMO resources for a candidate patient, other institutions will be contacted to assist.	*Prepare*			

	• During an ongoing incident, such as a pandemic, proactive guidance may need to be developed or adjusted for:
	  • event-specific changes in prognosis.
	  • halting or modifying E-Cardiopulmonary resuscitation programs (enhanced CPR).
	  • disproportionate pediatric/adult needs
	• Limited supply of equipment (circuits, disposables, etc.) and brokering of same.
	• Decision-making re: potential candidates from referring hospitals in need of inter-hospital transport (e.g., de-emphasize cannulation prior to transfer).
	• Central transfer process for considering referrals of potential ECMO candidates (daily on-call designee rotating between major centers/systems).
		Reallocate			

ECMO (Extracorporeal membrane oxygenation)
STRATEGIES FOR SCARCE RESOURCE SITUATIONS

Category	*RESOURCE and RECOMMENDATIONS*	*Strategy*	*Conventional*	*Contingency*	*Crisis*
Space	• ECMO requires intensive care unit space which may be at a premium in epidemic situations. In most cases, space will not be the limiting factor in restricting access to ECMO treatment.				
Supplies	• Oxygenator/pump – there is no substitute for the pump – one patient, one pump. Once all available pumps are in use, there is essentially no reserve. Additional pumps could be solicited as leased units or loaned units from inter-state facilities though in a national epidemic/pandemic this is not likely to be helpful • Tubing/circuits/sheaths – although the vascular sheaths for cannulation are widely available, the specific circuits for the pumps are proprietary and extremely expensive. Stocking additional circuits is an excellent idea, but unlikely given cost and may be a key limiting factor in nationwide incidents. Availability of the circuits through vendors may be limited during national event	*Prepare*			
Staff	• Perfusionist and trained nursing staff may be a key factor in continuing services. These staff often cover multiple hospitals and most hospitals do not have a large cadre of trained providers. • Training of additional personnel could help mitigate shortages, though providers must be able to keep training current. Illness of providers during an epidemic/pandemic could result in severe shortages of qualified staff. • Most nursing staff are intensive care nurses – because ECMO care is usually 1:1 in a major epidemic/pandemic ECMO may be too resource-intensive to continue as the staff involved could be caring for a larger number of critical care patients.	*Prepare* *Conserve* *Reallocate*			
Special	• Families should be counseled routinely that ECMO is a limited resource and is considered a trial of therapy rather than a resource assignment	*Prepare*			

ECMO (Extracorporeal membrane oxygenation)
STRATEGIES FOR SCARCE RESOURCE SITUATIONS

Triage	Assumptions • Some uses of ECMO are better characterized, allowing a degree of prediction about relative benefit and duration of use • When ECMO demand is high and prioritization is necessary, those conditions with historically better outcomes and shorter duration of use should generally be prioritized • When determining if a patient's use of ECMO will be curtailed, providers should assess the relative degree of benefit, anticipated (or actual) duration of use, and the patient's overall prognosis • Patient and family members will be counseled that ECMO is a highly specialized resource and may have to be withdrawn depending on the patient's prognosis and response to treatment • Patients should continue to receive all other forms of support (unless other support is subject to other al- location strategies) – this may include transitioning back to high-intensity mechanical ventilation. Routine palliative care team consultation should be considered for all ECMO patients. • Literature on prognosis continues to evolve. The ECMO directors' group will re-evaluate priorities based on current evidence • The amount of resources required to maintain ECMO patients both directly related to perfusion as well as support staff and supplies (e.g., blood products) may not be sustainable when critical care resources are stressed by an incident. At that point provision of ECMO may need to be restricted or discontinued to allow those resources to be used for other patients.	*Reallocate*			

ECMO (Extracorporeal membrane oxygenation)
STRATEGIES FOR SCARCE RESOURCE SITUATIONS

<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>Triage</td><td>General Priority for ECMO Given Constrained Critical Care Resources:
<table>
<tr><th>Tier (Predicted Survival)</th><th>Short Duration (<5 days)</th><th>Long Duration (>5 days)</th></tr>
<tr><td>First Tier (>60%)</td><td>Cardiac arrest or cardiogenic shock due to deep accidental hypothermia (rewarming) Pediatric post-cardiotomy Acute hypercarbic respiratory failure due to status asthmaticus.</td><td>Acute respiratory failure due to infection (especially influenza), single-organ failure Acute respiratory failure due to trauma (drowning, pulmonary contusion, etc.), single-organ failure</td></tr>
<tr><td>Second Tier (30-60%)</td><td>Poisoning-induced cardiogenic shock Massive pulmonary embolism Refractory VF/VT cardiac arrest with favorable prognostic features (extracorporeal CPR [E-CPR])</td><td>Acute respiratory failure from any cause with multi-organ failure (including kidney injury requiring dialysis or hypotension requiring vasopressor support)</td></tr>
<tr><td>Third Tier (<30%)</td><td>Adult post-cardiotomy Cardiac arrest with non-shockable rhythm or unfavorable prognostic features, including most adult, in-hospital cardiac arrest</td><td>Bridge to lung transplantation for irreversible respiratory failure Acute respiratory failure and severe immunocompromise (e.g., stem cell transplant <240 days post-transplant) Cardiovascular collapse refractory to vasopressors in the setting of multi-organ failure of any cause (e.g., septic shock).</td></tr>
</table></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Treatment</td><td>• Selected surgeries may need to be deferred if possible if the need for post-operative ECMO is high.
• Consideration should be given to earlier and more aggressive trials of lung recovery (weaning) during the venovenous ECMO course to limit duration of therapy when demand is high.</td><td>Conserve</td><td></td><td></td><td></td></tr>
<tr><td>Transport</td><td>• Transportation of a patient on ECMO requires a specialized transport team including a perfusionist and/or trained nurse.
• Ground, rotor-wing, and fixed-wing ambulances may be used for transport but not all ambulances can accommodate an ECMO patient, the team, and the equipment. Hospitals should identify critical care transport providers prior to an incident that can coordinate the movement of cannulated patients.</td><td>Prepare</td><td></td><td></td><td></td></tr>
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