

Clinical Guidance for NDMS Outbound Aeromedical Adult Patient Evacuation: A Toolkit for Civilian Hospitals

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AN ACUTE EVACUATION EVENT
TURN TO PAGE 12
FOR IMMEDIATE CLINICAL GUIDANCE



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Introduction

A no-notice, catastrophic disaster such as an earthquake will cause thousands of injuries, creating an unprecedented surge on healthcare facilities in the disaster area to provide immediate and ongoing care to the newly injured. These new patients would be in addition to the normally full capacity of our healthcare system. The most recent Earthquake Engineering Research Institute (EERI) report on the effects of a magnitude 6.7 earthquake along the Seattle Fault estimates over 6,000 people will suffer injuries that are life threatening or require hospitalization (EERI, Scenario For A Magnitude 6.7 Earthquake On The Seattle Fault, June 2005, page 126). In addition, the report states: “physical damage to hospitals will be widespread,” thus further reducing the ability of healthcare to provide patient care.

The ability to create surge capacity within our healthcare system is the subject of much planning and resource management across the country. Surge capacity planning involves a wide spectrum of activities from rapid discharge and/or transfer of stable patients to identifying non-traditional patient-care areas and resources to help expand current capabilities. The movement of patients to non-impacted facilities could be done locally, intra-state, inter-state and, in the case of a catastrophic disaster, transferring patients to a distant location not impacted by the disaster.

In the event that local resources for the transport and receipt of patients are overwhelmed and the disaster is catastrophic, the Washington State Department of Health (WA DOH) may request activation of federal-level resources to assist with patient movement. One resource is the National Emergency Medical Services contract that would provide additional Emergency Medical Services (EMS) resources (personnel and ground/air transportation) to aide in patient movement. Another federal-level resource that could be activated is the National Disaster Medical System. Through the use of Department of Defense (DOD) resources, NDMS can facilitate the aeromedical evacuation of stable, hospitalized patients to a distant, non-disaster struck area for ongoing care. By moving patients out of the disaster zone, capacity is opened up to provide care for the newly ill or injured.

The DOD, US Air Force and US Army have done extensive planning and exercising with the NDMS Patient Movement system. These military organizations have assets, comprehensive knowledge and experience in aeromedical patient evacuation. However, when these much needed military assets are brought into the civilian arena, there exists a significant knowledge gap. Many civilian healthcare systems have minimal understanding of the NDMS Patient Movement capabilities and type of preparation needed for aeromedical patient evacuation. This became most evident in Hurricane Katrina when multiple aeromedical evacuations missions were done under less than ideal circumstances (Haulman DL, *The US Air Force Response to Hurricane Katrina*, 17 November 2006).

A substantial number of improvements have been made since then. However, questions remain, such as: What types of patients can NDMS transport? What documentation needs to be provided? How are patients tracked and returned? Can medications be sent, and if so, what types? The “Clinical Guidance for NDMS Outbound Aeromedical Adult Patient Evacuation: A Toolkit for Civilian Hospitals” has been designed to address these gaps.

Purpose

This Toolkit is a guide to the clinical selection and preparation of adult patients for evacuation by air in the aftermath of a catastrophic event. Aeromedical patient transportation has more stringent criteria for clinical appropriateness than ground transportation because of altitude physiology and the inherent space limitations involved.

The Toolkit should be used in your healthcare institution’s planning and preparedness activities for patient evacuation. However, this Toolkit is also designed to be used in response -- in the “heat of the moment” when an evacuation is imminent. Quick references and checklists provided will help guide the user through the NDMS outbound patient process. The primary goal is to maintain patient care and ensure patient safety, given what will most likely be extreme conditions.

Note: The use of abbreviations and acronyms has been limited in this Toolkit; however, during an actual event, acronyms will be used and it is important to familiarize yourself with the NDMS terminology. Please refer to Appendix L for a complete list of acronyms.

Scope

This Toolkit has been developed for use by civilian healthcare clinicians during a catastrophic disaster to identify, evaluate and prepare adult patients for Aeromedical Evacuation (AE) to an appropriate healthcare facility outside the disaster zone. There are many other players and stakeholders that would be involved in an aeromedical evacuation incident. The activities and responsibilities of these other stakeholders are not addressed in this Toolkit.

While additional evacuation resources are available through the National Emergency Medical Services contract, their processes for patient selection and preparation are a part of the Washington State Department of Health patient movement plan, currently in development, and may differ from the guidance offered in this Toolkit. For the purposes of this Toolkit only information related to an NDMS DOD patient movement incident has been included.

In general, pediatric patients (under the age of 18) cannot be transported via the NDMS Aeromedical Evacuation (AE) plan. However, exceptions are made, especially for stable adolescent patients who can travel with a medical attendant. Such patients will be considered on a case-by-case basis and pediatric criteria for NDMS transport is not discussed in this document.

Assumptions

This Toolkit is designed to be a supporting document to a healthcare institution's overall evacuation plan and to local, regional and state patient evacuation plans. This Toolkit is only applicable during catastrophic disasters when local resources and capabilities have been exhausted and large numbers of hospitalized patients still need to be moved away from the disaster-struck area in order to continue providing care during a medical surge. *It should be assumed that all other local and regional evacuation and patient surge capabilities have been exhausted prior to implementing this Toolkit.* It is also assumed that early discharge and possible local transfer have already been evaluated and maximized. Please refer to local, regional and state patient evacuation plans for additional evacuation planning information.

Stakeholders

In the event of a catastrophic disaster necessitating an aeromedical evacuation, there would be many different organizations and individuals that would have input or be impacted. These stakeholders include, but are not limited to:

- Hospital administration and clinicians
- Healthcare coalitions
- Regional Disaster Medical Control Centers (DMCCs)
- State Disaster Medical Control Centers (State DMCC's)
- Emergency Medical Services (EMS)
- Local and regional public health jurisdictions
- Washington State Department of Health (WA DOH)
- Local and regional emergency management agencies
- Washington State Emergency Management Division (WA EMD)
- National Disaster Medical System (NDMS)
- American Medical Response (AMR)
- US Department of Health and Human Services (HHS)
- US Northern Command (serving all branches of the military)
- US Transportation Command (USTRANSCOM)

Overview of Disaster Declaration and NDMS Patient Movement Process

Disasters are always managed at the local and state level initially. If the magnitude of the disaster is beyond local and state response capabilities, assistance from other states may be requested through the Emergency Management Assistance Compact (EMAC) and/or federal assistance may be formally requested by the Governor. If the event is clearly catastrophic, with national significance, the President of the United States may grant a Disaster Declaration before receiving the Governor's request, which makes federal resources immediately available. The Secretary of the Department of Homeland Security (DHS) may also choose to elevate federal

assets prior to or immediately following an incident. Even with an immediate response, it could take several days to mobilize resources.

After a Presidential Disaster Declaration, the Governor must make an additional request for patient evacuation support from the Federal Government, which will trigger an NDMS patient movement event. The Federal government will then utilize available and appropriate equipment, resources and personnel from around the country to fulfill this request. Patient movement resources may include ground transportation as well as aeromedical resources coming from either the DOD or through the HHS National Ambulance Contract.

The information and resources in this Toolkit become applicable once a request for federal assistance for patient evacuation support has been granted. The state Emergency Operations Center (EOC) will request hospitals to gather and submit patient information to the DOD for use when planning the necessary resources and personnel for an NDMS outbound patient movement mission. The forms provided in this Toolkit will aid clinicians in gathering this information.

Overview of NDMS Patient Movement System

The National Disaster Medical System is a partnership between the HHS, the DHS, the DOD and the Department of Veterans Affairs (VA) that operate under the direction of the Federal Emergency Management Agency (FEMA). It is a federally coordinated system that augments the nation's medical response capability. The overall purpose of the NDMS is to assist state and local authorities in dealing with the medical impacts of major peacetime disasters and to provide support to the military and the VA's medical system in caring for casualties evacuated back to the US from overseas armed conventional conflict. The three major components of NDMS are: medical response, patient evacuation and definitive care.

HHS is the Lead Federal Agency (LFA) for a public health and medical service response in the United States. In essence, HHS manages NDMS. When HHS requires patient evacuation, the DOD as well as the National Emergency Medical Services contract can move patients to one or more pre-designated locations. These locations are called Federal Coordination Centers (FCC).

What are Federal Coordinating Centers? The mission of a Federal Coordinating Center is to receive, triage, stage, track and transport inpatients affected by a disaster or national emergency to a participating NDMS inpatient hospital capable of providing the required definitive care. An FCC also has the potential to receive military patients should the DOD Health System and the VA Contingency Hospital System be overwhelmed during a military contingency. An FCC is defined as a Federal facility (DOD or VA) located in a metropolitan area of the United States and/or Puerto Rico, responsible for day-to-day coordination of planning and operations in one or more assigned geographical NDMS Patient Reception Areas (PRA).

What is the hospital's role in NDMS? Any hospital, whether affiliated with NDMS or not, may evacuate patients out of a disaster zone utilizing NDMS resources. Hospitals receiving NDMS

evacuated patients are accredited hospitals, usually over 100 beds in size and located in large US metropolitan areas that have entered into a voluntary agreement with NDMS. Receiving hospitals agree to commit a number of acute care beds, subject to availability, for receiving NDMS patients. Because this is a completely voluntary program, hospitals may, upon activation of the system, provide more or fewer beds than the number committed in the agreement.

The DOD's aeromedical evacuation system typically utilizes two types of aircraft for NDMS patient movement: C-130s and C-17s. They are both military transport planes that can be configured to hold patients, but the C-130 is the primary aircraft planned for use in a Defense Support of Civilian Authorities (DSCA) event due to the fleet availability and the integral litter-carrying capacity. FCC airfields are specifically identified for their capabilities of handling these types of aircraft, their proximity to NDMS hospitals and the local resources available to help support the patient reception center. NDMS patient reception area plans for each selected airfield are tested on a regular basis to ensure they continue to meet the requirements of an NDMS inbound patient reception event.

Patients being moved by NDMS will be selected and assigned ("regulated") to FCCs outside the disaster area. At the receiving locations the FCCs work with local EMS to sort, assess and transport arriving patients to participating NDMS hospitals according to procedures developed in coordination with local authorities and NDMS.

NDMS patient care generally encompasses basic life support care for patients during transport. Aeromedical Evacuation (AE) missions always have a basic aeromedical crew of two flight nurses and three medical technicians who provide en-route care at the level of inpatient medical-surgical nursing but do not have critical care assets. If critical care patients need evacuation via NDMS, hospital personnel should communicate those explicit inflight patient care needs and requirements through the use of this Toolkit. The state Department of Health in coordination with NDMS and DOD resource planners will then ensure that critical care team members and equipment are identified and tasked for the mission. There are two different types of critical care teams that work with NDMS to support critical care AE patient movement: HHS has Mobile Acute Care Response Teams (MAC-T) and DOD has Critical Care Air Transport Teams (CCATT). Both teams can operate at the departing airfield. These teams will be responsible for preparing and staging critical patients for flight. If critical care is required inflight on a DOD aircraft, a CCATT will be assigned to that respective flight. However, these critical care teams are limited. Therefore advance notification and planning is critical to ensure safe evacuation of critically ill patients.

Toolkit Implementation Recommendations

It is recommended that each hospital participate in training sessions on the use of this Toolkit. Training sessions will introduce clinicians to the Toolkit concepts, checklists and worksheets that they would use during an evacuation.

Because the materials in this Toolkit are likely to be needed quickly and under stressful situations, it is recommended hospitals produce packets in advance containing one each of the appendices A through J. In the event of an NDMS aeromedical evacuation, clinicians are to use one packet for each patient being evaluated.

Clinical and Patient Care Information for Patient Evacuation

This section of the NDMS Patient Movement Toolkit will provide information for clinicians involved in direct patient care and patient selection for NDMS aeromedical evacuation. The four steps of the patient movement process include:

- Identify appropriate patients for aeromedical evacuation
- Prepare selected patients for movement
- Transport patients to designated receiving areas
- Track patients and patient information

The NDMS/US Air Force AE system moves stabilized patients with airways protected and breathing and circulation controlled using specialized equipment and aeromedical personnel comprised of flight nurses and aeromedical technicians. The US Air Force also has designated CCATTs that are available for the treatment of critical care patients. CCATT are comprised of a physician, nurse and respiratory technician. In order to ensure critical care patients are appropriate for flight, NDMS has developed MAC-T teams to receive patients from hospitals at the departing airport and care for them while they await air transport and care by CCATTs.

Patient Considerations for Flight - Overview

Multiple planning factors are considered when assigning patients to an aeromedical evacuation flight. The clinical considerations of the patients to be transported are matched with the available aircraft, medical equipment and aeromedical personnel who will provide care for the patients during flight. Always remember that aeromedical patient evacuation may not be the best and safest way to evacuate a patient depending on their clinical situation. See Appendix A “Contraindications for Aeromedical Evacuation” for absolute and relative contraindications for flight. Clinical factors that impact the choices of aircraft, equipment and personnel for the DOD flights include:

- Bariatric patients: Patients over 250 pounds will need an Over Size Litter (OSL), which takes up more space than a normal litter. Use of OSLs will affect the litter configuration of an aircraft.
- Critical care patients: No more than 20% of patients on any flight manifest will be critical care patients as this requires additional specialty care teams such as the CCATT, with either 3 ventilator patients, 6 critical non-ventilator patients, or a subset of each per mission.
- Highly contagious or contaminated patients: Isolation is extremely difficult to maintain during NDMS/DOD patient evacuation, so patients requiring isolation may not be transported by aeromedical evacuation. Ground evacuation is possible if resources are available.
- Patients with disease processes that may be affected by going up to altitude: Aerospace physiology plays a role in the safe transport of patients at altitude (e.g. patients with small bowel obstruction/trapped air or significant hypoxia). Therefore, each patient is evaluated individually. A flight surgeon (FS) may determine that a patient with some contraindications can fly, but with a cabin altitude restriction. In cases such as this, a

lower cabin altitude restriction will have significant effects on fuel levels and flight times.

- Special patient categories include pregnant patients and mental health patients. These patients must be evaluated on an individual basis for their appropriateness for aeromedical evacuation.

Before any patient is evacuated using the NDMS AE System, it is important to identify any risk factors for air travel. Major medical risks associated with transport by air include hypoxia and gas expansion. Additionally, patients will be subjected to increased noise, temperature fluctuations and decreased humidity, vibrations, and the stresses of multiple transfer points between the transferring and receiving hospitals. For more detailed information on flight physiology and the effects on various disease processes please see the Clinical Flight Physiology References (Appendix K).

1. Identify Appropriate Patients for Aeromedical Evacuation

During this first step clinicians will begin to evaluate patients for their appropriateness for flight (referred to as ‘validation’ and ‘regulation’ by DOD):

- A. Complete the **“Contraindications for Aeromedical Evacuation” form (Appendix A)**
 - This checklist should be applied to all patients under consideration for AE.
 - If the answer is “No” to all items listed on the form, the patient will most likely be a good candidate for AE. Proceed to step B.
 - If a patient has possible contraindications, proceed to Step B and note these contraindications on the NDMS Patient Movement Request (PMR) form (Appendix B).
 - Not all patients can be safely moved by AE. Principles of flight physiology and limitations on what can and cannot be done during flight dictate which patients can fly and how they should be prepared to fly. For more detailed information regarding flight physiology and its impacts on military medical decision-making, please refer to the section above entitled Patient Considerations for Flight. A list of clinical flight references also can be found in Appendix K.
- B. Complete the **“NDMS Patient Movement Request (PMR)” form (Appendix B)**
 - Information on the PMR form is necessary for NDMS/US TRANSCOM to consider when selecting patients for aeromedical evacuation. Hospitals should prepare this information for each patient considered for AE by NDMS.
 - The PMR Data Point Descriptions Chart (Appendix B1) describes the type of information needed for each box on the PMR. In particular, the “PMR Remarks” box is important to review because it specifies important clinical information about the patient that may influence the choice of aeromedical equipment and medical flight staff configurations.

- USTRANSCOM's Joint Patient Movement Teams (JPMTs) may make contact with each hospital to assist in patient selection and preparation.

2. Prepare Selected Patients for Movement

Once a patient is approved and validated for flight on a DOD aircraft, they will be added to patient flight manifests. During this step hospitals will be provided a list of their selected patients to prepare and transport to the departing airfield along with an arrival time to the Aerial Port of Embarkation (APOE). Clinicians now begin to prepare the selected patients for the AE mission. Things to consider when preparing a patient for aeromedical flight include:

- Review the PMR for the selected patient to ensure all information is correct and there have been no changes to patient status.
- Use the **Patient Documentation Checklist (Appendix C)** to ensure the patient travels with appropriate documentation, identification, medical records and personal items.
- Use the **Patient Equipment Checklist (Appendix D)** to document all medical equipment being sent with the patient.
 - Only authorized medical equipment is allowed on DOD AE missions. If a patient is flying on DOD aircraft, the original medical equipment that comes with the patient from the transferring hospital will be switched over to DOD 'approved for flight' medical equipment.
 - Hospitals should make sure their equipment is labeled appropriately to facilitate the return of equipment. (Note: NDMS AE does not return equipment. A local process would need to be developed to support the return of medical equipment to hospitals.)
- Use the **Patient Preparation Checklist (Appendix E)** to ensure that all patient lines and equipment are secured and readied to military aeromedical evacuation standards.
 - Aeromedical evacuation includes traveling in cramped and noisy quarters. Aeromedical flight crews can do basic monitoring, but all invasive procedures such as intubation, inserting central lines, changing IV sites, dressing changes, Foley catheters, etc., should be performed BEFORE the patient leaves the hospital. If there is any likelihood that the patient will need any invasive procedure in the next 12 hours it is highly advised that the procedure be done prior to leaving the hospital.
 - The Patient Preparation Checklist (Appendix E) provides guidelines and recommendations for aeromedical flight preparation given certain clinical scenarios. Please review this entire list with every patient to ensure a safe transport.
- Use the **Patient In-Transit Medication list (Appendix F)** to document the prescribed medications that will be traveling with the patient. It is recommended that a patient is provided with 12 hours' worth of medications. For critical medications (i.e., vasoactive drugs, insulin and/or anticoagulants) provide 24 hours' worth of medication.
 - This medication list may not be the complete list of patient medications. The full medication list should be included in the Patient Documentation Checklist (Appendix C) that should accompany every patient.

- Transit times will vary and be 10-12 hours at minimum 10-12 hours, but delays are to be expected due to weather, manifest changes, other critical missions, etc.
- Pre-medicate as much as possible especially for pain, as the flight crew may not be able to medicate for an extended period of time due to turbulence or other aircraft or patient emergencies.
- Use the **Patient Personal Belongings List (Appendix G)** to document all personal belongings traveling with the patient. Patient belongings should be limited to a small carry-on bag as space is extremely limited aboard DOD aircraft. Do not transport large amounts of cash or valuables.
- There will be no radiology, blood, lab or food services available at the departing airport. These services will not be available until arrival at the designated receiving hospital. If possible, consider sending some food (snacks) with the patient especially if the patient has restricted or special dietary needs. Potable water will be available at the departing airport.
- Aeromedical flight crews will only honor either “full code” or “no code” while the patient is in-transit. Valid DNRs must be signed within 72 hours of evacuation (see the **Do Not Resuscitate (DNR) Certificate for Aeromedical Evacuation form Appendix H**). Partial codes may be reestablished once the patient has been admitted into the receiving hospital.
- As mentioned previously, pediatric patients are not usually transported by NDMS. However stable adolescents can be considered on a case-by-case basis and may travel with a responsible adult (medical/non-medical attendant). However, the **Consent for Medical Care and Transportation of Minors (Appendix I)** form must be completed and signed for a minor or a ward of the state approved by NDMS for evacuation who is traveling without a responsible adult.
- Provide the patient and their family with the **Patient and Family NDMS Aeromedical Evacuation Information Sheet (Appendix J)**. This information sheet will help answer their questions and prepare them for the evacuation process. Limited family members and/or attendants may be able to travel with the patient during an AE mission.
- The patient being transported under NDMS for a DOD aeromedical evacuation mission must expect the process to be a full day event from leaving the hospital to arrival at the receiving hospital. Hospital staff should prepare patients for a long day.

NDMS support for patient movement

- Evacuating hospitals need to send the patient from the hospital to the departing airport with the appropriate level care staff, whether EMS or hospital staff.
- If requested, military Aeromedical Evacuation Liaison Teams (AELTs) may deploy to evacuating hospitals to assist with patient preparation for a DOD flight (verify and coordinate physiology of flight issues/facilitate validation of patients).
- Departing airports may be staffed with either a MAC-T or CCATT in order to stage critical care patients for flight, depending on their availability.

- Either an ALS EMS crew or appropriate hospital staff person must accompany the critical care patient to the departing airport and manage patient care until a MAC-T or CCATT can take over care.

3. Transport Patients to Designated Receiving Area

It is the evacuating hospital's responsibility to coordinate patient transport to the departing airport. Refer to the hospital's general evacuation plan for patient movement procedures.

Transporting EMS staff will:

- Provide appropriate patient care during transport from the hospital to the APOE.
- Hand off patient care, any medications and personal belongings to the medical staff at the departing airport following established protocols.

4. Track Patients and Patient Information

HHS is responsible for tracking patients while in the NDMS from originating facility to destination facility using the Joint Patient Assessment and Tracking System (JPATS). The JPATS is managed by HHS and tracks the location and status of NDMS patients entered into the system. Anyone inquiring about the status of a patient in the NDMS AE system should start by requesting information through the WA EOC. (Note: state-level plans related to patient movement are still in development.) The Health Insurance Portability and Accountability Act (HIPAA) regulations regarding patient information, although sometimes relaxed during a disaster in order to facilitate family reunification, remain in place to safeguard patient privacy.

Local hospitals, healthcare coalitions and/or public health may also use their own patient tracking systems to track patient locations, following locally established protocols. Healthcare facilities transferring patients by NDMS aeromedical evacuation should document when the patient leaves their facility, what service transports the patient to the departing airport and if a final destination is known. Transporting EMS services should document the transfer of patient care, following their established procedures.

A patient who has entered the NDMS AE system may choose to opt out of the process at any time that it is reasonably safe to do so. If a patient chooses to opt-out, they must sign a "Certificate of Release" that releases NDMS from any further responsibility for the patient and/or their family traveling with them. The patient should be aware that if they do opt out NDMS will not reimburse them for any costs related to patient care going forward nor the costs of lodging or traveling home or to another destination.

Appendices

The forms and checklists in the appendix section of this Toolkit have been designed to help facilitate the collection of patient information for an AE mission. Forms are meant to be copied and used when evaluating individual patients and preparing selected patients for aeromedical evacuation.

Appendix A: Contraindications for Aeromedical Evacuation

This checklist reviews all of the potential major and relative contraindications when sending a patient up to altitude for an aeromedical patient evacuation mission. Patients who have any major or relative contraindications are usually not approved for aeromedical flight without a waiver or extenuating circumstances as approved by the US TRANSCOM validating flight surgeons. The risk of many contraindications can be mitigated with appropriate preparation, i.e., oxygen for flight, chest tube insertion, etc.

Appendix B: NDMS Patient Movement Request (PMR) Form

This form provides vital information to NDMS for selecting patients for an aeromedical evacuation mission. Refer to the PMR Data Point Descriptions following the PMR for information on filling out this form. This form captures the data points required for the TRAC2ES Uploadable Contingency Spreadsheet (TUCS) form used by TRANSCOM.

Appendix B1: PMR Data Point Description Chart

This chart gives definitions for the data points listed on the PMR.

Appendix C: Patient Documentation Checklist

This checklist is designed to identify and track all necessary checklists and patient forms that must be completed and included in the patient record packet when the patient is evacuated. Individual hospital's evacuation plans may specify that certain patient medical records accompany the patient when they evacuate the facility. Refer to the hospital's evacuation plans for specifics regarding patient documentation. Space is available on this form to add in those specific records.

Appendix D: Patient Equipment Checklist

List all medical equipment accompanying the evacuating patient. Note that only approved, flight-tested medical equipment may accompany patient while airborne. The Aeromedical Flight crews will swap unapproved medical equipment out for approved medical equipment. Connectivity and compatibility with standard AE devices as well as power, oxygen and suction are critical.

Appendix E: Patient Preparation Checklist

Aeromedical evacuation includes traveling in cramped quarters. It is important that patients be prepared for the restrictions of flight medical care. This checklist will assist clinicians to prepare the patient for safe transfer.

Appendix F: Patient In-Transit Medication List

List only medication prescribed for the patient during travel and/or medications that have been transported with patient. A complete list of medications should be listed in patient's record.

Appendix G: Patient Personal Belongings List

List any personal belongings that the patient is bringing with them, along with any identifying information about the item. Personal belongings should be limited to a small carry-on bag.

Appendix H: Do Not Resuscitate (DNR) Certificate for Aeromedical Evacuation

Aeromedical Flight crews will only honor either "full code" or "no code" while the patient is in-transit. Valid DNRs must be signed within 72 hours of evacuation. Partial codes may be reestablished once the patient has been admitted into the receiving hospital.

Appendix I: Consent for Medical Care and Transportation of Minors

This form must be completed for any patient who is a) under age 18 and not capable of directing self-care, b) under age 14, or c) a ward and is traveling unaccompanied by a responsible adult.

Appendix J: Patient and Family NDMS Aeromedical Evacuation Information Sheet

Information sheet for patient and families to help them understand what to expect during an aeromedical evacuation.

Appendix K: Clinical Flight Physiology References

References for further clinical information related to aeromedical evacuation of hospitalized patients.

Appendix L: Abbreviations and Definitions

Abbreviations, definitions and purpose of terms used in this Toolkit

Appendix A: Contraindications for Aeromedical Evacuation

This checklist reviews all of the potential major and relative contraindications when sending a patient up to altitude for an aeromedical patient evacuation mission. Patients who have any major or relative contraindications are usually not approved for aeromedical flight without a waiver or extenuating circumstances as approved by the TRANSCOM validating flight surgeons. The risk of many contraindications can be mitigated with appropriate preparation, i.e., oxygen for flight, chest tube insertion, etc.

Patient Name: _____		
MRN ID#: _____ DOB: _____		
Major Contraindications	Yes	No
Unstable critical care patient ("stable" defined as airway secured, bleeding controlled, fractures splinted and shock treated) or patient extubated for <4 hours prior to transport		
Pregnancy in active labor (Labor must be controlled)		
NICU/PICU patients		
Actively hemorrhaging with Hgb <8.5		
Chronic anemia with Hgb less than 8.0 or Hct below 25%		
Untreated pneumothorax or chest tube removal <24 hours prior to transport		
Unbivalved circumferential orthopedic cast <48 hours old (Unless specifically ordered by physician)		
Pneumocephalus		
Intraocular air		
Significant communicable disease requiring negative pressure or specific isolation (e.g., TB, Ebola, SARS, Measles, etc.) (Unless approved by validating flight surgeon – may need N95 mask for transport)		
Post procedure <7 days for the following procedures __ Open heart surgery __ Craniotomy __ Spinal surgery		
Acute Coronary Syndrome (approved on a case by case basis)		
New onset cardiac dysrhythmia (approved on a case by case basis)		
Combative or uncontrollable patient		
Relative Contraindications	Yes	No
Chronic anemia with HCT <25 may need an altitude restriction, with low flow O ₂		
General surgery cases: Post-op <72 hours (unless waived by flight surgeon)		
Agitation or other behavior distracting to flight (unless medicated or in restraints and accompanied by an attendant)		
Bowel obstruction or ileus may need an altitude restriction		
Significant hypoxia (may require supplemental oxygen)		
Decompression sickness (unless approved with an altitude restriction)		
High risk OB (uncontrolled pre-eclampsia, multiples, pre-term labor)		
Dialysis (pt who must receive dialysis within the window of evacuation)		
Acute Hgb <8.0 (non-chronic)		

Each patient will be reassessed by NDMS medical personnel at the DASF.

Appendix B: NDMS Patient Movement Request (PMR)

This form provides vital information to NDMS for selecting patients for an aeromedical evacuation mission. Refer to PMR Data Point Descriptions (Appendix B1) for information on filling out this form. * indicates minimum data required.

NDMS PATIENT MOVEMENT REQUEST: Patient Information	
*LAST NAME:	
*FIRST NAME:	*MIDDLE NAME:
MRN ID #	ID Other:
AGE: _____	WEIGHT: _____ GENDER: <input type="checkbox"/> Male <input type="checkbox"/> Female
PATIENT HISTORY:	
VS HR: _____ RR: _____ BP: _____ Pulse Ox: _____ FiO2: _____	
*PMR REMARKS (Information for AIR CREW): *Allergies *Medications	
CCATT (Y/N):	<input type="checkbox"/> Yes <input type="checkbox"/> No
SPACE TYPE:	<input type="checkbox"/> Litter <input type="checkbox"/> Ambulatory
PRECEDENCE	<input type="checkbox"/> Routine <input type="checkbox"/> Priority <input type="checkbox"/> Urgent
MEDICAL SPECIALTIES	<input type="checkbox"/> Burn <input type="checkbox"/> Critical Care <input type="checkbox"/> Med/Surge <input type="checkbox"/> Pediatrics <input type="checkbox"/> Psychiatric <input type="checkbox"/> Isolation Precautions <input type="checkbox"/> Orthopedics <input type="checkbox"/> OB <input type="checkbox"/> Cardiac
DNR STATUS	<input type="checkbox"/> Full Resuscitation <input type="checkbox"/> No Resuscitation
# ATTENDANTS:	0 1 2 3 4 5 6 7 8 9 10
ATTENDANT NAMES:	_____ _____ _____ _____ _____ _____ M = Medical Attendant NM = Non-medical Attendant
*Next of Kin/Contact Person and phone #	
TRANSPORT ORIGIN (Name of originating facility):	

Appendix B1: PMR Data Point Descriptions

*Minimum data required

Data Point	Description
*Last Name	Self-explanatory
*First Name	Self-explanatory
*Middle Name	Self-explanatory, could be an initial
MRN ID #	Medical Record Number (MRN) Unique identifier number
ID Other	Other unique identifier number if not MRN
Age	Chronological age. Patients under 18, or wards, traveling unaccompanied may need a signed Consent for Medical Care and Transportation in the Aeromedical Evacuation System (Appendix E). Under age 3 = infant.
Gender	Self-explanatory
Patient History	Brief history including vital signs, active, current medical problems. Include any history significant to patient care at altitude, even if it is not related to the patient's immediate past medical history, and history of respiratory illnesses or other medical condition that would be adversely affected at altitude.
*Patient Movement Request (PMR) Remarks	Include medical orders for patient during transport; information necessary for Aeromedical personnel to appropriately care for the patient such as: -Oxygen needs and O2 saturation -*Medications -*Allergies -Vent settings -Medication drip settings -if Pt head must be elevated -Patient's weight (Note if over 250 pounds) -Medical equipment must accompany Pt -Care instructions relative to altitude
CCATT	Critical Care Air Transport Team necessary for critical care patients: -Yes -No Any ICU/CCU/Telemetry/CVU/Burn Pt automatically requires CCATT care
Space Type	Indicate the mobility of the patient: -"Ambulatory" for patients that can move unassisted -"Litter" for patients that must be moved by litter or gurney Patients classified based upon their ability to self-help in an emergency
Precedence	Indicate the urgency of patient movement; choose: -Routine ("green" patients, usually moved within 72 hours) -Priority ("yellow" patients, usually moved within 24 hours) -Urgent ("red" patients, require immediate movement)
Medical Specialty	Indicate the type of medical care the patient requires: -Burns (SBN) -Critical Care (CC) -Medical/Surgery (MM-SS) -Orthopedics -Pediatrics (MC) (no neonates) -Psychiatry -Isolation Precautions -OB -Cardiac
DNR Status	DNR orders must be signed within 72 hours of aeromedical evacuation. Flight medical crews will provide 'full code' only during transit: -Yes -No
Attendants	Number of attendants traveling with patient. Medical Attendants (MA) necessary for patients requiring special attention enroute; MAs responsible for delivering care during transport & coordinating care with Flight RN. Referring facility to provide MAs. Non-Medical Attendants (NMAs) may be family members or others who are significant to the patient, especially if the patient is under age.
Attendant Names	Names of each attendant; indicate medical (MA) or non-medical (NMA)
Next of Kin	Name and contact information for a person responsible for your affairs
Transport Origin	Name of the facility evacuating the patient

Appendix C: Patient Documentation Checklist

This checklist is designed to identify and track all necessary patient forms. These need to be completed and sent with the patient when they are evacuated. Section A is a list of required forms needed by NDMS. Section B allows you to keep track of your standard evacuation patient medical records. Refer to your hospital's patient evacuation plan for additional medical records.

Patient Name: _____		
MRN ID#: _____ DOB: _____		
A. Checklists and Patient Forms Needed by NDMS	Needed	Completed Initials
Contraindications for Aeromedical Evacuation (Appendix A)		
NDMS Patient Movement Request (PMR) (Appendix B)		
Patient Equipment List (Appendix D)		
Patient Preparation Checklist (Appendix E)		
Patient In-Transit Medication List (Appendix F)		
Patient Personal Belongings List (Appendix G)		
NDMS Do Not Resuscitate (DNR) (Appendix H)		
Consent for Medical Care and Transportation of Minors (Appendix I)		
B. Recommended Standard Patient Transfer Documentation:	Needed	Completed Initials
History of Present Illness (HPI) (SBAR)		
Operation and/or Procedure Reports		
Discharge Summary (if available)		
Active Problem Lists		
Past Medical History		
Recent Lab and X-ray reports		
Medications (MAR)/Allergies		
Next of Kin or emergency contact name and number		
NOTE: Do not remove patient hospital ID bands		
Other: (list below)		

Appendix E: Patient Preparation Checklist

Aeromedical evacuation includes traveling in cramped and noisy quarters. Aeromedical flight crews can do basic monitoring, but all major procedures such as intubation, inserting central lines, IVs, Foleys, G-tubes, etc., should be performed BEFORE the patient is transferred to the DASF at the APOE. If you feel there is any likelihood that the patient will need any invasive procedure in the next 12 hours it is *highly advised* that the procedure be done proactively prior to leaving the hospital. It is important that patients be prepared for the restrictions of in-flight medical care. This checklist will assist clinicians to prepare the patient for safe transfer.

Patient Name: _____		
MRN ID#: _____ DOB: _____		
Patient Preparation	Yes	No
Airway secured - ET Tube; ventilator (Consider proactive intubation in a potentially unstable airway. Patient should not be extubated less than 4 hours prior to a flight)		
Bleeding controlled/IV access must be established if previous history of hemorrhage. Consider central line and arterial line for better in-flight monitoring of unstable patients.		
Fractures splinted – circumferential plaster casts must be at least 48 hours old. If less than 48 hours or at a high risk for vascular compromise the cast should be bi-valved; no hanging weights for traction		
Shock treated; central line placed and 24 hours of pressors to be sent with pt.		
Seizure potential – IV access established, medications provided		
Lines and tubes secured, labeled and patent drains emptied and documented		
Chest tubes must have Heimlich valve or chest drainage system with integral one-way valve. Chest tubes cannot be removed in flight. Patient must be stable 24-hours post-chest tube removal with stable CXR before flying.		
Clean and fresh dressings applied. Dressings are only reinforced inflight; document any drainage prior		
Vital signs/pain medication/restraints (pre-medicate for pain/comfort prior to departure		
ET Tube balloon (to be filled with air); Foley balloon (to be filled with saline); consult Flight Surgeon for any other balloon devices		
Glass IV bottles if required should be vented		
No approved glucometer on board aircraft for non-critical patients so document glucose levels just prior to flight. If the patient has his/her own glucometer, send it with the patient for use on the ground		

Appendix H: Do Not Resuscitate (DNR) Certificate for Aeromedical Evacuation

Aeromedical flight crews will only honor either “full code” or “no code” while the patient is in-transit. Valid DNRs must be signed within 72 hours of evacuation. Partial codes may be reestablished once the patient has been admitted into the receiving hospital.

Patient Name: _____		
MRN ID#: _____ DOB: _____		
DO NOT RESUSCITATE (DNR) CERTIFICATE FOR AEROMEDICAL EVACUATION		
ATTENDING PHYSICIAN CERTIFICATE		
<p>I, _____ (name of <i>Attending Physician</i>, clearly printed), certify that I personally examined the patient identified as _____ (name of <i>Patient</i>, clearly printed) and that he/she is suffering from a terminal and incurable illness where death is imminent (that is death could naturally occur at any time and, to a certainty, will occur within one year or less). The patient and/or legal representative, having been so advised, has requested that resuscitation not be initiated in the event of a cardiopulmonary arrest during aeromedical evacuation processing to point of destination hospital.</p> <p>A Do Not Resuscitate (DNR) order has been entered in the patient’s medical record, dated _____, in accordance with the patient’s representative’s informed consent.</p>		
NOTIFICATION OF NEXT OF KIN		PATIENT NEXT-OF-KIN OR LEGAL GUARDIAN
PRINTED NAME (<i>Last, First, Middle Initial</i>)	SIGNATURE	TELEPHONE NUMBER
ATTENDING PHYSICIAN		
SIGNATURE	TELEPHONE NUMBER	DATE (YYYYMMDD)

Appendix I: Consent for Medical Care and Transportation of Minors

This form must be completed for any patient who is a) under age 18 and not capable of directing self-care, b) under age 14, or c) a ward (of an individual or of the state) and is traveling unaccompanied by a responsible adult.

Patient Name: _____	
MRN ID#: _____ DOB: _____	
CONSENT FOR MEDICAL CARE AND TRANSPORTATION IN THE AEROMEDICAL EVACUATION SYSTEM	
<p>I, the undersigned, am the parent/legal guardian of _____ <i>(Last, First, Middle Initial)</i> who is now under the care of a Uniformed Services physician. I understand that my child/ward will travel in the military aeromedical evacuation system to receive care at other medical facilities (military or civilian) and to return home to me. I realize that my child/ward may unexpectedly incur some other illness or sustain an injury either during this travel or while at the medical facilities, but that no list of possible illnesses or injuries is possible here.</p> <p>Because I am unable to accompany my child/ward, I authorize and give my consent to all attending medical personnel within the system and facilities referred to above, to treat and care for my child/ward for any illness or injury that should occur during my absence, including all reasonable care needed for that condition or complication of it.</p> <p>This authority covers any emergency condition that involves the life or death of my child/ward, as well as any non-emergency condition <i>(such as cold or superficial cut)</i>. If my child/ward resists medical attention/instructions, I give my consent to all medical personnel to use any reasonable discipline that a licensed physician considers necessary.</p> <p>I also give my permission to place my child/ward on any Department of Defense-owned or controlled aircraft or other vehicle so that he/she can be transported to or from a medical facility. This consent is to last during my period of absence, and I can withdraw this consent at any time.</p>	
PRINTED NAME OF PARENT/GUARIAN <i>(Last, First, Middle Initial)</i>	PHONE
	HOME <i>(with area code)</i> CELL <i>(with area code)</i>
SIGNATURE OF PARENT/GUARDIAN	DATE OF SIGNATURE (YYYYMMDD)
PRINTED NAME OF WITNESS <i>(Last, First, Middle Initial)</i>	ADDRESS OF WITNESS <i>(Mailing or Street)</i>
SIGNATURE OF WITNESS	DATE OF SIGNATURE (YYYYMMDD)

DD Form 2239

Appendix J: Patient and Family NDMS Aeromedical Evacuation Information

NDMS Patient Information

Frequently Asked Questions

Because of the catastrophic disaster that has impacted our area, our hospital is evacuating patients, in partnership with the National Disaster Medical System (NDMS). You have been selected for evacuation so that your care may be continued at a different location.

This information sheet provides a brief overview of your transport to a new hospital and answers some key questions you might have.

What will happen on the day of my evacuation?

You will be transported by local EMS providers from the hospital to an airfield. Once you arrive at the airfield, medical providers will care for you until you are on board the plane. *(Note: If possible, utilize bathroom facilities before boarding the flight.)*

The care you have been receiving at our hospital will be continued, as best as possible, during your flight by Aeromedical personnel, including doctors, nurses and technicians. All the care that you receive will be documented, just as if you were in the hospital.

If you develop a medical problem while in flight, the Aeromedical flight crew will take care of any medical issues that arise.

How will my family know where I am?

Your information will be entered into a patient tracking system maintained by NDMS. At points along your journey, information will be added about where you are. NDMS personnel will always know where you are and can communicate that information to your family or loved ones.

Will someone from the hospital be traveling with me?

A medical attendant may travel with you if your condition requires one and a medical attendant is available to travel with you.

Can my family or loved ones travel with me?

It is possible for family members or other loved ones to travel with you. They are called 'non-medical attendants'. Space is limited on the aircraft, so the number of 'non-medical attendants' traveling with you may be limited.

I'm worried that I won't be comfortable on the flight.

Your comfort is important to everyone involved in your transport. If you experience any pain or discomfort, tell the person who is providing your care.

In addition, here are some tips to help keep you comfortable during the flight:

- If you have any issues with allergies or a head cold please let the Aeromedical flight crew know prior to the flight. They can provide support to prevent ear and sinus blocks.
- The noise level on the plane will be loud. Earplugs will be available; ask for them if they are not given to you.
- Sleep, if you can. Extra blankets and pillows may be available.
- If you have been lying down, ask if you may sit up. If you cannot sit up, you may want to elevate your head or change your position. Ask the Aeromedical flight crew for assistance.
- Water will be available during the flight. We encourage you to bring bottled water with you prior to arriving at the airfield.
- We encourage you to bring snacks or food with you if think you will need to eat during the time you are between hospitals. In most cases snacks, won't be available during the evacuation process.
- You may experience a dry mouth because of the reduced humidity on the plane. Mouth swabs may be available and can help reduce the feeling of a dry mouth.
- Damp washcloths or antiseptic towelettes may be available for you to wash or freshen up with.
- Bathrooms may be available depending on your aircraft. Ask the Aeromedical flight crew to assist you if you need to use the bathroom. If you are lying down and cannot get up, the Aeromedical personnel will assist you with urinals, bedpans and modesty curtains.
- Please tell the aeromedical flight crews of any history of air sickness or fear of flying.
- You may feel the effects of fatigue while flying because of your current health issues. The Aeromedical personnel will do their best to help you reduce fatigue. Ask the Aeromedical flight crew to assist you if you feel uncomfortable in any way.

What will happen when I arrive at my destination?

When you arrive at your destination, medical personnel will take you off the plane. They will re-evaluate how you are doing after your flight to make sure you are being sent to the appropriate healthcare facility.

Your patient tracking record will be updated by NDMS to indicate what city you are in and what hospital you will be transferred to.

Service Access Teams (SAT) may be available to assist you and your family or loved ones with any needs while you are away from home.

Will the medical providers on the plane know about my Do Not Resuscitate (DNR) order?

We encourage you to discuss with your physician whether you want to have a ‘Do Not Resuscitate’ (DNR) order in place during your flight. Your physician must sign that order within 72 hours of your departure.

Will I be able to travel with my child who is being evacuated?

If your child is under age 14 or needs a guardian, you may travel with them as ‘non-medical attendants’. If you are not able to travel with your child, you will sign a “Consent for Medical Care and Transportation in the Aeromedical Evacuation System” form giving the Aeromedical flight crew permission to provide medical care to your child.

Can I bring my service animal with me?

Service animals/emotional support animals may accompany you, as long as you can provide health and vaccination documents for them, and they will remain under your control during the trip. Only one service/support animal is allowed per patient.

What if I don’t want to be transported to a new location?

You may choose to stop participating in the NDMS patient evacuation event at any time it is reasonably safe to do so. If you choose to opt out, you must sign a ‘Certificate of Release.’ Note that if you opt out, NDMS will not reimburse you for any of your costs related to your care going forward, or the costs of traveling to your home or other destination.

What kind of plane will I be flying on?

You may be flying on a Department of Defense military transport plane or a FEMA-contracted civilian air or ground ambulance. This will depend on many factors such as your medical condition, the medical equipment that you require, distance you are traveling, and the medical attendants that you may require. The people planning the evacuation will choose the best transportation choice for you, based on what resources are available.

Appendix K: Clinical Flight Physiology References

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Appendix L: Abbreviations and Definitions

Abbreviations, definitions and purpose of terms used in this Toolkit.

Abbreviation	Definition	Purpose/Description
AELT	Aeromedical Evacuation Liaison Team	Assist the sending facilities with patient preparation.
AE	Aeromedical Evacuation	Movement of patients by aeromedical assets.
ALS	Advanced Life Support	
APOE	Aerial Port of Embarkation	An airfield capable of landing C-130s or C-17s and on-loading patients from evacuating hospitals.
BLS	Basic Life Support	
CCATT	Critical Care Air Transport Teams	Military specialized providers that care for patients requiring critical care during DOD transport.
DASF	Disaster Aeromedical Staging Facility	Teams and equipment that arrive at the selected airfields to prepare and stage patients for an aeromedical evacuation mission on DOD aircraft.
DHS	Department of Homeland Security	
DMCC	Disaster Medical Control Center or Disaster Medical Coordinating Center	Coordinates patient distribution.
DNR	Do Not Resuscitate	
DOD	Department of Defense	
DSCA	Defense Support of Civilian Authorities	Military assistance for civilians within the US during a disaster.
EERI	Earthquake Engineering Research Institute	Authored the Magnitude 6.7 Earthquake on the Seattle Fault Scenario.
EMS	Emergency Medical Services	
EOC	Emergency Operations Center	
FEMA	Federal Emergency Management Agency	
FCC	Federal Coordinating Center	A facility responsible for day-to-day coordination of planning and operations for NDMS Patient Reception Areas for receiving patients being evacuated from a disaster zone.
FS	Flight Surgeon	
HICS	Hospital Incident Command System	
HIPAA	Health Insurance Portability and Accountability Act	Patient privacy rules.

HHS	US Health and Human Services	The US government's principal agency for protecting the health of all Americans and providing essential human services, especially for those who are least able to help themselves.
IRCT	Incident Response Coordination Team	NDMS team that helps facilitate response planning and coordination.
JPATS	Joint Patient Assessment and Tracking System	HHS – Patient Tracking system with 2-person teams for patient movement support at the APOE. Ensures all data is collected for patients. Can be at the originating facility, DASF/APOD/FCC and destination facility to help with the tracking and movement of patients.
JPMT	Joint Patient Movement Team	4-person teams that, when requested, deploy to assist the State EOC to support regulating and validation (approval process) of patients that will fly on DOD military aircraft.
LFA	Lead Federal Agency	
MAC-T	Mobile Acute Care Team	Consists of civilian providers to take care of critical care patients at the DASF. MAC-T is an ESF 8 function under the IRCT as an HHS capability to provide stabilizing care and preparation for flight for critical care patients. They fall under the command and control of the Director of Patient Staging while at the DASF.
NDMS	National Disaster Medical System	Federally coordinated system that augments the nation's medical response capability.
NICU	Neonatal Intensive Care Unit	
NWHRN	Northwest Healthcare Response Network	Healthcare coalition supporting disaster preparedness and response for healthcare partners in King and Pierce counties.
OSL	Over Size Litter	DOD litter designed to support patients weighing 250 to 350 pounds. OSL litters take up the space of two or more normal litters and therefore will decrease the number of patients that can be manifested on a DoD aircraft.
PICU	Pediatric Intensive Care Unit	

PRA	Patient Reception Area	A physical location where NDMS patients are received when they come off an aeromedical evacuation flight and before they are transported to the destination hospital. Patients are provided medical care while at the PRA/
PMR	Patient Movement Record or Patient Movement Request	Documentation of patient care during aeromedical evacuation (Air Force Form 3899); or Information on individual patients to be considered by NDMS for inclusion on an evacuation mission. Appears on the TUCS form.
TRAC2ES	TRANSCOM Regulating and Command & Control Evacuation System	TRAC2ES is DOD's web-based tracking system used to create and track Patient Movement Requests (PMRs) and Traces Uploadable Contingency Spreadsheet (TUCS). TRAC2ES links the PMR/TUCS with medical evacuation transportation assets. This facilitates the patient movement planning and management process and allows continuous tracking of patient locations on In-Transit Visibility (ITV). The automated process can match patient movement requirements with available beds/capability and patient movement transportation resources for patients managed by US TRANSCOM.
TUCS	TRAC2ES Uploadable Contingency Spreadsheet	An Excel spreadsheet created specifically for DSCA events that contains the minimal essential medical and administrative information for a patient to fly on a DOD aircraft. It is generated at the state EOC by the JPMT from the originating hospital's spreadsheet that lists patients requiring evacuation. It must contain all potential clinical information for patients being considered for an aeromedical evacuation mission. TRANSCOM selects patients for a mission from the TUCS form and builds a mission.
US TRANSCOM	DOD's US Transportation Command	Logistics, planning and operations related to patient movement for NDMS, located at Scott AFB, IL.

WA DOH	Washington State Department of Health	
WA EMD	Washington State Emergency Management Division	
VA	Department of Veterans Affairs	
VFS	Validating Flight Surgeon	A DOD physician that specializes in aerospace physiology and is the final approving authority for a patient to fly safely on a DOD aircraft. They will normally be located at Scott AFB, IL.